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Municipal Finances and The Adoption of Participatory Budgeting in Germany – an Empirical Analysis of Adoption Patterns from an Economic Perspective

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List of Abbreviations

AIC	Akaike´s Information Criterion
Art.	Article
BB	Brandenburg
BW	Baden-Württemberg
BY	Bavaria
FAG	Finanzausgleichgesetz
GEE	Generalized estimating equation
GemHVO	Gemeindehaushaltsverordnung
GG	Grundgesetz (Basic Law, own translation)
GO	Gemeindeordnung (municipal constitution, own translation)
HDI	Human Development Index
HE	Hesse
HR	Human Resources
Inhab.	Inhabitants
KGSt	Kommunale Gemeinschaftsstelle
MV	Mecklenburg-Western Pomerania
NGO	Non-governmental organization
NI	Lower-Saxony
NRW	North-Rhine Westphalia
NSM	Neue Steuerungsmodell
NW	North-Rhine Westphalia
OECD	Organisation for Economic Co-operation and Development
PA	Population-averaged model
PA GEE	Population-averaged General Estimating Equation
PB	Participatory Budegting
PP	Purchasing Power
Pr	Probability
QIC	Quasilikelihood under the Independence Model Information Criterion
RP	Rhineland-Palatinate
SD	Standard Deviation
SH	Schleswig-Holstein
SL	Saarland
SN	Saxony
SS	Subject-specific model

ST	Saxony-Anhalt
TH	Thuringia
U.S.	United States of America
UCLGA	United Cities and Local Governments of Africa
UK	United Kingdom
UN	United Nations

1 Introduction

A growing degree of voter abstention and dissatisfaction with politics is putting the political systems of modern democracies under pressure to prove their legitimacy. Germany is affected by disenchantment with politics and low voter turnout poses challenges to the existing democratic system.

Direct participation in the political process can help citizens to feel that they are taken seriously. It also has the potential to increase public interest in politics and to make politics more transparent, with the result that citizens feel more satisfied with political outcomes. At the municipal level, the participation of citizens is particularly relevant as their daily life is directly influenced by budgetary decisions. In Germany, various instruments are available for the direct involvement of citizens at the local level, i.e. as citizens' councils, citizens' petitions, referenda etc. In recent years, municipalities have adopted another instrument known as "Participatory Budgeting", which is the subject of this dissertation. The European Union lists "Participatory Budgeting" as an example of good practice for its public tenders under the European Social Fund 2014-2020, recognizing it as a sustainable tool for shaping the future of Europe (European Union 2017). Indeed, more and more European countries have made use of this tool, not least due to increasingly scarce resources. As an efficient and effective budgetary policy it is associated with a high potential to mobilize politically inactive citizens, and can have positive effects on citizens such as enhanced civic education and participation.

Participatory Budgeting (PB) is a popular political innovation that spread quickly around the globe. During a PB process, citizens discuss the allocation of public revenues and expenditures with government representatives during meetings designated for that purpose over a year. This makes PB a particularly interesting innovation from an economic point of view. At the core of this instrument is the discussion of public finances. Thus, it is not limited to a specific political topic, as would be the case for a referendum. Furthermore, the municipal budget determines the course of governance and the municipality's room for manoeuvre in the coming year, and therefore has a direct impact on the citizens and companies within a municipality or city.

The incidence of PB processes is steadily increasing worldwide. In some countries, such as Peru and the Dominican Republic, municipalities are even required to introduce PB (Dias et al. 2019). The first PB process was adopted in the city of Porto Alegre in Brazil in 1989 after the end of military dictatorship in the 1980s and was thereafter adopted by more than 200 municipalities (Sintomer et al. 2008, p. 166 sub seq.). In the cities, the distribution of PB was even

more impressive. By the year 2004, 58 percent of Brazil´s population lived in a city with a PB process (Marquetti 2005). PB also rapidly travelled the globe: in 1999 only a handful of PB programs worldwide was counted, but by 2019 nearly 12,000 PB cases in 71 countries have been identified (Dias et al. 2019).

As it spread around the globe, the objective and design of PB changed substantially. In the initial phase of PB adoption, PB was a highly symbolic tool for the leftist Brazilian Worker's party, which was the driver of the adoption of the first PB processes in Brazil, and thus PB became a tool associated with leftist inclusive policy. The rationale behind this type of PB process was to radicalize democracy and to include marginalized groups of society. In the global North, PB has become a tool to make administration and the allocation of resources more efficient. Often it has been adopted in a broader reformation of the administrative apparatus in New Public Management style. The principal goals associated with these kinds of PB processes are to reduce citizens' disillusion with politics and to enhance citizens' awareness of the finances in their city. Hence an initially politically loaded tool became a tool adopted for economic purposes. However, it lost some of its strength because, in this newly adopted version, it was mostly consultative rather than binding as it had been in its original version.

The first German municipality adopted PB in the 1990s. Since then, more and more municipalities have adopted PB processes. The number of PB processes in Germany peaked around the year 2013, before declining until the year 2015. After that, the number of processes started growing again, but the increase was only moderate. Currently, 96 German municipalities employ PB projects and a further 3 municipalities are considering whether to introduce a PB process in their local environment. In addition, there are a further 176 municipalities that employed a PB process in the past but no longer do (Bundeszentrale für politische Bildung n.d.).

Overall, only a small share – around 2.3 percent – of all German municipalities have adopted a PB process so far. There are only a few municipalities in which PB has become a fixed part of the local decision-making process and the political culture. Although many municipalities discussed the idea of PB, they eventually never adopted it. The diffusion is further characterized by a very uneven regional distribution of municipalities with PB in Germany. There are clusters of municipalities that have adopted PB in Western, Eastern and South-West Germany, but virtually none in Bavaria or Northern Germany. The focus of this thesis is to ask why this is the case, and to identify the drivers of PB adoption in German municipalities.

Aim, research question and research steps

The research question of this thesis is: Which factors lead to the adoption of PB in Germany from a public finance economics point of view?

To answer the main research question, this thesis aims on answering the following sub-questions:

A. **What is the role of municipalities in the federal system of Germany and how does PB adoption fit into this system?**
   - Which tasks does the municipal level fulfil?
   - What are the sources of municipal income?
   - What possibilities do municipalities have to take on debt and how has municipal debt developed?
   - What is the traditional budgeting process in Germany?

B. **What are the origins of PB and how are PB processes implemented in Germany?**
   - What is PB?
   - How has PB diffused globally?
   - When and under which circumstances was PB introduced in Germany?
   - What are the drivers of PB adoption by municipalities in Germany?
   - How are PB processes designed in Germany?
   - Which effects of PB have been found in the scholarly literature?
   - Which factors have been found to influence PB adoption in the scholarly literature?

C. **How can the diffusion/ adoption of PB be explained by economic theories?**
   - What can be learned from Public Administration theories and research?
   - Can specific adoption and diffusion patterns of PB in Germany be explained by Fiscal Federalism and Public Choice theories?
   - Which factors have been found in the Policy Diffusion literature to motivate adoption of political innovations in general and PB processes in particular?

D. **Which factors influence the probability to adopt a PB process?**
   - Are there clusters of municipalities with similar characteristics that adopt PB in Germany?
   - How do municipalities with and without PB differ with regard to mean values of budgetary, political, socioeconomic, demographic and institutional variables?
   - Which factors influence the adoption of PB in Germany?
   - Which factors influence different stages of PB adoption in Germany?

To answer these research questions, the following research steps are carried out:

- A detailed analysis of municipal public finances in Germany is provided. The role of municipalities in the fiscal system of Germany is presented. It is explained which tasks municipalities fulfil, how the composition of its tasks has changed historically and how expenditure categories vary. The different sources of municipal income are explained and data regarding the current composition of municipal income are presented. Furthermore, the legal background of public borrowing for the local level is explained. Moreover, the budgetary cycle of German PB processes is explained and it is shown how PB processes intertwine with the existing structures.

- Theories from Public Administration, Fiscal Federalism, Public Choice and diffusion of innovations are applied. These theories are used to explain the incentives driving politicians to adopt PB from a public finance point of view. Based on this analysis, hypotheses for statistical testing are developed.

- Quantitative analysis using cluster analysis, mean value comparisons and t-tests, logistic regression with a population-averaged model suitable for panel data analysis and ordered logistic regression are performed. These statistical analyses are applied to find statistical differences of variables between municipalities with and without PB. Furthermore, hypotheses on the factors that influence PB adoption are tested, and zero hypotheses are rejected or accepted. The ordered logistic regression shows how the different variables affect different stages of PB adoption such as pre-form, adoption, and continuation. For this purpose, a unique panel dataset consisting of 2,951 German municipalities with more than 5,000 inhabitants in the period 2008 to 2014 was compiled. This dataset is the basis for the econometric analyses in this thesis.

The research steps and research questions are connected in a way that answering the research questions fulfils the research tasks.

This thesis contributes to the literature by filling in at least five research gaps.

First, there are no studies linking PB adoption with municipal finances in Germany (**Research Gap 1**). Most studies focus on how PB processes fit in decision-making institutions and the effects which they have on deliberation quality and democratic structures. The relationship between PB and the traditional municipal budgetary policy, the composition of the budget, and fiscal indicators like the budget deficit have not yet been adequately researched. In this thesis,

the author investigates how PB processes are integrated into the existing system of municipal finances and local budgeting in Germany.

Second, there is a lack of studies using economic theories to explain the adoption of PB (**Research Gap 2**). The existing literature mostly analyses PB adoption from a political sciences point of view, with reasons for adoption based on political ideology – as PB was a tool of leftist policies for a long time – and political competition. This study instead contributes to the knowledge of PB by considering the topic from a public finance economics perspective.

Third, there are as yet no empirical studies which explore differences in variables between municipalities with and without PB in Germany **(Research Gap 3)**. In this thesis, the author applies a cluster analysis and mean value comparison to describe differences in budgetary and economic variables between municipalities with and without PB. A unique dataset was compiled for this purpose.

Fourth, there are no studies that analyse the relationship between PB adoption and economic variables econometrically **(Research Gap 4)**. Empirical studies consist mostly of case studies, expert interviews, or smaller surveys. There are only very few studies that use statistical analysis in an attempt to analyse PB diffusion with the models developed by the literature on policy diffusion. To date, there has been no study that systematically analyses those factors which lead to the adoption of PB processes in Germany. This study aims to fill this gap by performing a logistic regression analysis, revealing which factors have an influence on PB adoption in Germany.

Fifth, this thesis contributes to the literature by quantitatively investigating those factors which lead to different stages of PB adoption, such as introduction or continuation **(Research Gap 5)**. So far there has only been one study that uses regression analysis to identify those factors which lead to PB adoption, to PB survival and to the abandonment of PB (see Spada 2014).

This doctoral thesis has six chapters, including introduction and conclusion.

The second chapter presents the legal status of municipalities and their role in the federal system of Germany, municipal finances and the traditional budgetary process. The chapter starts with a portrayal of the federal system of Germany in section 2.1. Section 2.2. focuses on the presentation of municipal finances by describing municipal tasks and revenues. Section 2.3 explains the traditional local budget process in Germany. Finally, section 2.4 closes by giving a summary of the most important conclusions from the chapter.

The third chapter takes a closer look at the main subject of this thesis. In Section 3.1 the term Participatory Budgeting is defined and its origins and global diffusion are reviewed. Section 3.2 describes the circumstances under which the first PB processes were introduced into Germany, and the diffusion of PB processes throughout the country. Section 3.3 presents a literature review of PB. It categorises the literature into research that investigates the adoption and diffusion of PB, the goals of PB, the process design and outcomes of PB processes, and finally the criticism which has been levelled at PB.

The fourth chapter introduces economic theories that can be used to explain PB adoption. In section 4.1, Public Administration research is summarized. In section 4.2., Fiscal Federalism theories are presented and the author analyses how they can explain PB adoption from an economic point of view. Section 4.3. presents factors that explain PB adoption based on Public Choice theories. Section 4.4 summarizes the literature of diffusion of policy innovations literature. Section 4.5 presents research hypotheses with regard to which factors influence PB adoption based on the theories discussed. Chapter 4 is closed with a summary in 4.6.

The fifth chapter contains the empirical analysis of this thesis. Here, the research question is tested by applying econometric methods. Section 5.1 starts with describing the dataset and variables used in the statistical analyses. Section 5.2 presents results from a cluster analysis and from mean value comparisons. Section 5.3 presents results from a population-averaged logistic regression analysis with regard to the main research question, asking which factors influence PB adoption in Germany. Section 5.4 summarizes the results of an ordered logistic regression relating to the factors which lead to different adoption stages for PB. Chapter 5 closes in 5.5 with the discussion of the results.

Chapter 6 comprises a summary of general conclusions regarding factors that influence PB adoption from an economic point of view, as well as possible directions for future research.

2. Municipal Finances in Germany

The public discussion of municipal finance among citizens is the main purpose of PB processes. This chapter provides a detailed analysis of municipal public finances in Germany. The role of municipalities in the fiscal system of Germany is presented. It is explained which tasks municipalities fulfil, how the composition of its tasks have changed historically and how expenditures categories vary. In addition, the different sources of municipal income are explained and data of the current composition of municipal revenues is presented. The legal background of public borrowing for the local level is described as well. Furthermore, the budgetary cycle of German PB processes is explained and it is shown how PB processes are integrated into the existing structures.

Section 2.1 starts with explaining the federal system of Germany. Section 2.2. focuses on the presentation of municipal finances. This section provides an overview of the legal basis of municipalities in the federal system of Germany, municipal tasks, municipal revenues and the options of municipal borrowing in Germany. Section 2.3 explains the traditional local budget process in Germany. The chapter is closed with a summary in 2.4.

2.1 The Federal System of Germany

In the following, first the political system of Germany is explained in 2.1.1, while in sections 2.1.2 and 2.1.3 a focus is put on explaining the financial relations between the different government levels.

2.1.1 Fiscal Federalism in Germany

According to Article 20 of the *Grundgesetz (GG),* which is the German Basic Law, Germany is a federal state with a three-level structure of government. Subordinate to the federal government are 16 *Länder*.[1] The lowest level of government is formed by the 11,014 municipalities (as of 2018, Statistisches Bundesamt 2019b, p. 29) which are constitutionally part of the *Länder* and are subject of instruction and supervision held by the *Länder*. The central level is mainly responsible for legislation, the distribution of public finances and the adoption of policy guidelines. *Länder* and municipalities implement and administer the specific policies. Lower levels

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[1] All laws cited in this work can be found in English language under the following link: https://www.gesetze-im-internet.de/englisch_gg/englisch_gg.html

of governments frequently carry out public tasks which are assigned to them by higher government levels. These tasks are often financed by grants tied to these specific tasks. This specific division of functions, in which the central decision making happens on central level and lower government tiers are in charge with the execution, has been labelled the horizontal approach to federalism in contrast to the vertical model of the Anglo-Saxon world (Spahn 1995, 2001).

After World War II, German federalism was intentionally designed as cooperative federalism. In comparison to other structure of states like the models of the Anglo-Saxon world, where there is a strong division of public tasks between the federal and state level, federalism in Germany is characterised by close cooperation between the Federation and the *Länder*. The GG specifies how competences between the different government tiers are distributed. Following the principle of subsidiarity, the GG grants primary state powers to the *Länder*. Accordingly, the *Länder* are in principle responsible for the fulfilment of state tasks as well as the exercise of state powers, unless the GG provides otherwise.

According to article 70 GG, the *Länder* level has the right to pass laws as well. The Federation may only assume state powers, perform tasks or enact laws if this is expressly permitted by the GG. In fact, however, the *Länder* level has increasingly lost competencies in favour of the federal government.

According to the GG, there are two forms of legislative powers on federal level. These types are exclusive and concurrent legislative power. Exclusive legislative power means that the Federation has the sole right to enact laws. In this case, the *Länder* have the power to legislate only if federal law gives them the permission to pass laws (Art. 71 GG).

The subject areas of concurrent legislative power are listed in Art. 74 (1) of the GG and Art.105 (2) of the GG. In the area of concurrent legislative power of the Federation (Art. 72 GG), the *Länder* only have the right to pass legislation if the federal government has not yet passed any laws concerning the respective areas (Bundesministerium der Finanzen 2021, p. 7/8).

In principle, the Federation can make use of concurrent legislative competence without additional conditions having to be met (Art. 72 (1) GG). In certain areas, however: "The Federation shall have the right to legislate on these matters if and to the extent that the establishment of equal living conditions throughout the federal territory or the maintenance of legal or economic unity renders federal regulation necessary in the national interest." (Art. 72 (2) GG).

Furthermore, *Länder* can deviate from the respective federal laws in certain matters that are part of the concurrent legislative power due to the abolition of the previous framework legislation of the Federation. Framework legislation allowed the federal government to enact framework laws for a number of areas, for example in higher education policy. With these, it provided

the framework for legislation, which the *Länder* parliaments could then fill out legislatively according to their needs. This was only changed during the federalism reform in 2006 (Art. 72 (3) GG).

In the areas in which the Federation uses its entitlements, the *Länder* can in principle no longer enact laws (Art. 72 GG). Existing *Land* law ceases to have effect (Art. 31 GG).

Even though, in reality the legislative powers lie mostly within the Federation, the *Länder* has the possibility to participate in important decisions through the *Bundesrat* (Art.50 GG). The government of each *Land* is represented in the *Bundesrat*. The large *Länder* have more representatives, the small *Länder* fewer.

This cooperative model of federalism in Germany changed more and more into what was coined by the political scientist Fritz W. Scharpf as the phenomenon of *Politikverflechtung*. This describes a state of increasing intertwining of competences between different levels of government (Scharpf et al. 1976).

The collaboration between the Federation and the *Länder* intensified at the end of the 1960s, primarily for economic reasons. In 1966, the Federal Republic of Germany experienced its first economic crisis and the government reacted to this crisis with government economic stimulus programmes. To speed up the effects of these stimulus programmes, economic and financial policies of all political levels were coordinated. In addition, the federal government had the aim to modernise the country, above all by expanding the welfare state. To achieve this, the federal order was redesigned (Kropp 2009).

An amendment to the GG in 1969 made it possible to expand framework legislation and thus make more policy areas than before available to the federal government for rule-making. *Länder* supported that change of the GG with required a two-thirds majority in the *Bundesrat*. New laws that affect *Länder* matters require the approval of the *Bundesrat*. The increasing interweaving of the government tiers was criticized for making federal decision-making intransparent and creating preferences for spending policies to satisfy all parties involved in decision-making (Kropp 2009).

The federalism reform of 2006 attempted to counteract the increasing interweaving of the federal government and the individual *Länder*. It sought to strengthen the legislation of the Federation and the *Länder* through a more transparent allocation of law-making competences and the abolition of framework legislation. Furthermore, it entailed laws to reduce mixed financing and a redefinition of the possibility of federal financial assistance. With the abolition of framework legislation, the matters previously assigned to it were reallocated between the Federation and

the *Länder*. Similarly, in the area of exclusive and concurrent legislation, competences for individual matters were reallocated. The exclusive legislative competences of the *Länder* were strengthened because the Federation withdrew from subject areas with particular regional relevance, and from those which do not necessarily have to remain under the control of the federal legislature. This applied, for example, to the penal system, the right of assembly, the law on homes, the law on shop closing hours, the law on development contributions, , the law on restaurants and the law on civil servants 'salaries and pensions. Furthermore, the need for approval of federal laws in the *Bundesrat* according to Art. 84 I of the GG was significantly curtailed. It was decided that federal legislature can regulate the establishment of authorities and the administrative procedure of the *Länder* without the consent of the *Bundesrat*, which had previously been required (Kropp 2009).

The core of further federalism reform in 2009 was the establishment of a debt brake in the GG. For the *Länder*, this meant that, by 2020, they were obliged to balance their budgets without annual new borrowing (Art. 109, 115, 143d GG). The debt brake is found in the new Art. 109 section III sentence 1 GG, according to which federal and *Länder* budgets have to be balanced. In the case of the Federation, this is reached if revenues coming from debt do not exceed 0.35 per cent of nominal GDP (Art. 109 (3), Art. 115 (2) GG). The *Länder*, on the other hand, are not permitted to incur structural debt at all (Art. 109 (3) GG). However, the Federation and the *Länder* may provide for regulations "to take into account symmetrically in the upswing and downswing the effects of an economic development deviating from the normal situation" (Art. 109 (3) GG).

In June 2017, the GG was again changed, this time to reorganise the federal fiscal equalisation system from 2020 and to strengthen the position of the federal level. The main change was an agreement on a new federal fiscal equalisation system in which equalisation payments between the *Länder* were eliminated and the federal government was obliged to contribute additional funds, from which all *Länder* benefit in comparison to the previous situation. Since 2020, underperforming *Länder* have been supported more strongly than before, through supplementary allocations from the federal government (Bundesministerium der Finanzen Monatsbericht 2017)

Furthermore, the federal government's powers to provide financial assistance for investments by the *Länder* and municipalities have been further expanded. The existing federal competence to co-finance investment projects of *Länder* and municipalities has been supplemented by far-reaching management and control rights of the Federation (Art.104b (2) sentences 2 to 4 GG).

According to the new article 104c GG, the federal level is now also allowed to provide financial assistance for investments of national importance carried out by financially weak municipalities, where these investments support the municipal education infrastructure. At the same time, the federal government will have improved possibilities to control the use of funds for financial assistance (Bundesministerium der Finanzen Monatsbericht August 2017). The restriction to financially weak municipalities has been lifted since 2019. This gives the federal government the possibility to support such investments in all municipalities, on the basis of Article 104c GG (Bundesministerium der Finanzen 2020). The federal government is also given sole responsibility for the planning, construction, operation, maintenance, financing and financial management of the federal motorways (Bundesministerium der Finanzen Monatsbericht August 2017). The next section gives an overview of the division of expenditure and revenue between the federal, *Länder* and local level in Germany.

2.1.2. Intergovernmental Financial Relations
2.1.2.1 Public Expenditure

Intergovernmental financial relations in Germany are very complex due to the increasing interweaving between the federal government and the individual *Länder*. This section focuses on explaining which government level is responsible for which type of expenditure.

The GG (Art. 73) lists the competences of the Federation and thus partly determines its tasks. The resulting exclusive federal legislation applies, for example, to foreign and defence policy, nationality, air transport, counterterrorism, and weapons law. With regard to the concurrent legislation, *Länder* have the power to pass laws as long as and insofar as the Federation does not decide to do so itself (Art. 72, 74, 74a, 75 GG). Tasks areas of the *Länder* are for example, the areas culture and schools, social welfare and law and order. Municipal tasks also comprise school affairs, social welfare, public health facilities, sports and recreation, public facilities and energy supply and transport (Spahn 2001, p.11). However, given the aforementioned high degree of horizontal integration of functions and shared responsibilities (*Politikverflechtung*), this division of responsibilities is not fully reflected in the distribution of public expenditures across the levels of government (Spahn 1995, 2001). Social policy is an example for a responsibility that is carried out by all government levels. Since higher levels of government tend to delegate the execution of many of their functions to lower levels, a single category of tasks and expenditures does not always correspond to a single level of government (Spahn 1995, 2001).

Table 2.1 shows the expenditure by government level for the years 1995, 2000, 2005, 2010, 2015 and 2020

Figure 1 Expenditure by Government Level
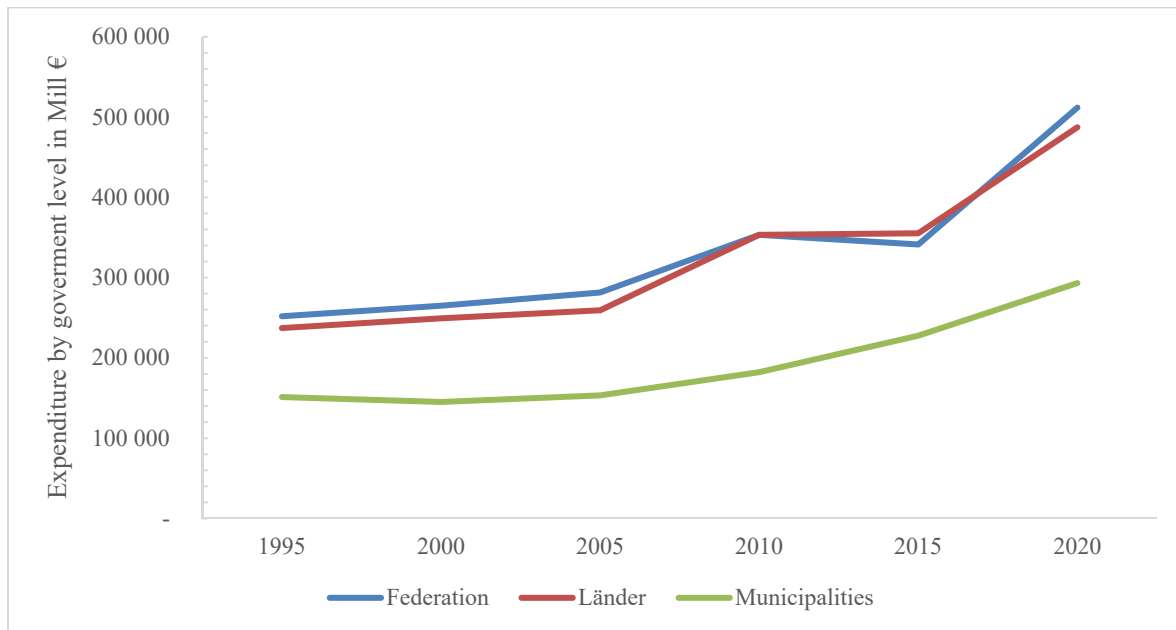
Source: Own diagram based on data of Statistische Ämter (n.d.). Statistische Bibliothek. Fachserie / 14 / 2, note: Data for the years 1995 and 2000 were converted from DM to Euro.

2.1.2.2 Public Revenue

In principle, each level of government in Germany must finance its own tasks by generating its own revenues. In accordance with the principle of connexity, the expenditure burden follows the task burden laid down in the GG in the sense of administrative competence (Art. 104a (1) GG). This means that the state level that is responsible for a task is also responsible for financing it.

However, there are examples for a mixed financing of the Federation and the *Länder*. For example, the GG grants the Federation powers to co-finance tasks of the *Länder* on account of its responsibility for the state and the economy as a whole. These mixed financing provisions have been partially restructured and supplemented within the federalism reforms of 2006 and 2009, as well as during the reorganisation of the Federation-*Länder* financial relations in 2017, and their further adjustment in 2019.When it comes to tax legislation, only the federal level has the power to enact new taxes and to change the tax system, but the *Länder* must approve the tax laws via the *Bundesrat*. Local governments and municipalities have hardly authority to enact taxes, only some smaller taxes can be designed by the *Länder* or local governments (Spahn 1995, 2001).

The concrete division of tax revenue between the regional authorities is regulated in Article 106 GG. There are taxes that are exclusively assigned to one of the three levels (municipal taxes, *Länder taxes*, federal taxes) and also joint taxes whose revenues are shared between the federal, *Länder* and municipal governments and the European Union. Customs duties are also part of the public revenues, however income from that source is rather small, with a share of 0.7 percent in 2018 (Bundesministerium der Finanzen 2020, pp. 16/17).

Figure 2.2 shows the type of taxes assigned to exclusively one level and how the income from the joint taxes is distributed between the different levels of government.

Figure 2: Tax Revenue for the Different Government Levels in Germany

Joint taxes		

Federation

50%	**Corporation Tax**	50%
42.5%	**Income Tax**	42.5%
52.9%	**Value Added Tax**	43%

Länder

4.1%   15%

Municipalities

Individual taxes		

Federation

Länder

Municipalities

| e. g. excise duties (excluding beer duty), insurance tax, and the surtax on income tax * | e. g. inheritance tax, beer duty and gaming casinos levy* | e. g. trade tax and real property tax* |
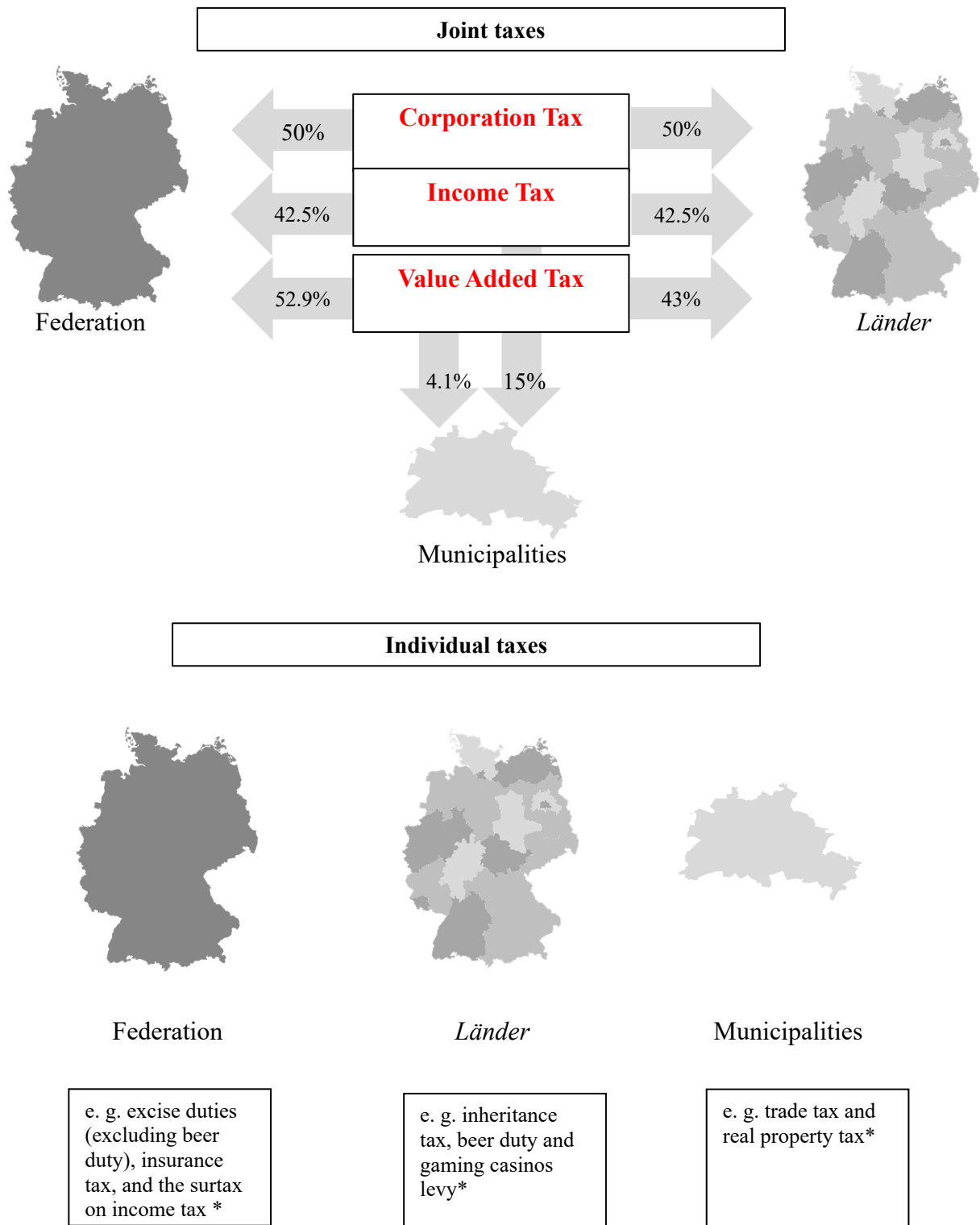
Source: Own diagram based on data of Bundesministerium der Finanzen 2021.

* English translation adopted from Bundesministerium der Finanzen 2021, p. 16

Article 106 GG defines where taxes are apportioned to a single government level. For the federal level, these include excise taxes and insurance taxes. *Länder* taxes include inheritance tax, beer tax and the gaming casinos levy. Individual taxes for municipalities include the trade tax and the real property tax (Bundesministerium der Finanzen 2021, p. 16).

All of the relevant public income sources are shared in Germany. These sources comprise the income tax, the corporation tax, and the value added tax, which accounts for three quarters of total tax revenue (73 percent of total taxes in 2018, Bundesministerium der Finanzen 2021, p. 16).

Municipalities receive exclusive tax revenue from real estate taxes, from trade tax and revenue from local consumption, and from expenditure taxes. Furthermore, they receive income from the joint taxes such as the income tax revenue, from the final withholding tax on interest and capital gains, and from the value added tax (Bundesministerium der Finanzen 2021, p. 56/ 57).[2]

Grants and Equalization

Grants are another important feature of German intergovernmental financial relations. After the primary division of the joint taxes, the secondary equalization scheme takes effect.

It regulates the redistribution of taxes horizontally according to certain keys, concerning the equalisation of several units of the same level like on *Länder* or regional level, and vertically between *Länder* and municipalities (Art. 106 (3), Art. 107 (1) GG).

The secondary equalisation on horizontal level comprises the *Länderfinanzausgleich*, that aims at equalising the revenues between the *Länder*. The fiscal equalisation system in the narrower sense consists of equalisation payments from richer *Länder* to poorer *Länder*. However, since 2020, financial relations have been reorganized to shift expenses to the federal level.

Correspondingly, the fiscal equalisation of the municipalities aims at ensuring vertical fiscal equalisation between the individual *Länder* and its municipalities on the one hand, and at ensuring horizontal fiscal equalisation between municipalities with different financial resources on the other hand.[3]

Furthermore, there are secondary vertical equalisation tools provided by the federal government to the *Länder* level which are called *Bundesergänzungszuweisungen*. These grants are given to financially weak states. There is another type which is called *Sonder-Bundesergänzungszuweisungen* which are grants that are given to some of the Western Länder in order to

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[2] For a more detailed portray of municipal revenues, see section 2.2.3.1.
[3] For a more detailed explanation of the municipal equalisation scheme, see section 2.2.3.1.

counterbalance losses they experience due to the inclusion of the Eastern *Länder* in the inter-state equalization scheme and grants provided for low-performing and financially weak *Länder* (Bundesministerium der Finanzen 2020, p. 42 sub seq.).

In summary, Germany´s system of cooperative federalism model turned into a progressively more complex and interdependent network of shared taxes and equalization grants. The principle of connexity was increasingly violated. As a consequence, it has become nearly impossible for voters and taxpayers to identify which government level spends money for which purpose and how taxes are divided. This also led to a lack of fiscal accountability at the municipal level. The problem is especially severe at the municipal level because tasks are delegated to the municipalities by subordinate government levels, with municipalities not even involved in legislation through the *Bundesrat* as is the case for the *Länder*. The federalism reform of 2006 therefore stipulated in Article 85 (1) of the GG that no tasks should be moved to the municipal level by federal law. However, in reality this still happens via the *Länder* (Zimmermann/ Döring 2019).

Thus, the problems caused by the intertwinement of public tasks and revenues remain. In addition, a trend towards centralisation can be identified. PB processes have the potential to counteract that trend to some extent. Even if PB processes are purely consultative, they can have positive effects for citizens by creating more fiscal transparency. However, it is costly and time-consuming for local decision-makers to adopt PB processes, and thus the question remains as to which incentives they have to adopt PB. Before this question is further discussed in the upcoming chapters, the legal basis of municipalities and municipal finances will be explained in more detail in the next sections.

2.2 Municipal Finances

This section is divided into three parts; section 2.2.1explains the legal basis of municipalities in Germany, 2.2.2 explains municipal tasks, and 2.2.3 presents sources of municipal revenue.

2.2.1 Legal Basis of Municipalities in the Federal System of Germany

The legal basis of the local level of government is well anchored in the German GG, with specific regulations outlining the revenue sources for local authorities. However, the tasks of local authorities are not defined in as much detail as they are for the other government tiers in the GG.

Constitutionally, municipalities are part of the *Länder* and are the subject of instruction and supervision held by the *Land*. However, Article 28 paragraph 2 GG grants them the right of local self-administration (dt. *kommunale Selbstverwaltung*). This gives them a certain budgetary sovereignty. The mayor and the municipal council make decisions about how to manage municipal finances. They can make decisions on larger infrastructure investments, to actively lobby for transfers, levy local taxes and issue public debt.

The rules governing municipal self-administration and the democratic order in the municipality are defined within an "inner" municipal constitution. This contains the municipal constitution (dt. *Kommunlaverfassung*) as well as the electoral law and is decided on *Länder* level for all municipalities in the respective state. Regarding this constitution, there are quite large institutional differences between the *Länder*. Each of the 16 *Länder* has its own constitutional rules concerning how jurisdictions are structured, what their competences and tasks are, what the budgetary process looks like and how citizens are involved in decision-making at the municipal level.

In the 1990s municipal constitutions were changed in all *Länder* and became more similar. The position of the mayor was strengthened in all *Länder*. The introduction of direct elections for the mayoralty has made a major contribution to this. The position of the mayor has been further strengthened by making him or her the head of the whole administration and giving him or her the power to make important operative decisions in most *Länder*. The *Land* North-Rhine Westphalia is an exception here, as the municipal council is responsible for the general principles according to which the administration is run, thus permitting it to intervene in the organizational sovereignty of the mayor.

In an attempt to make the mayor more independent of partisan influences and municipal representatives, the elections of the mayor and of the municipal council are separated in most *Länder*. The only exceptions are the *Länder* Bavaria and North-Rhine Westphalia, in which the elections take place at the same time. There are further differences between the *Länder* with regard to the municipal constitutions. For example, the mayor´s term of office varies between six and ten years. The longest term of office with 10 years is granted in Saarland and the shortest terms of

6 years can be found in the *Länder* Bavaria, Hesse, North-Rhine Westphalia and Thuringia. In the *Länder* Bavaria and Baden-Württemberg the mayor cannot be voted out of office, while in all other *Länder*, this is possible. Thus, the electoral law and the competences of the mayor and the council, which are regulated in the municipal constitution, lead to differences in the position of the mayor and his or her strength. In some *Länder*, such as Baden-Württemberg, Brandenburg, Saxony and Saxony Anhalt, the mayor is quite independent due both to having a longer term in office, and due to the different dates for the elections of the mayor and municipal council members; furthermore, there are a greater number of competences for the mayor in the management of the local administration. In other *Länder* such as Saarland, North-Rhine Westphalia and Hesse, the mayor has a relatively weaker position (Bogumil 2013, p. 33 sub seq.).

The municipal council must be democratically elected according to Article 28 (1) sentence 2 of the GG. The municipal council represents the citizens of the municipality and is directly elected for four, five or six years, depending on the respective municipal constitution. The number of elected council members varies from 6 to over 90 members, depending on the number of inhabitants with main residence registered in the municipality. The municipal council is responsible for all matters concerning the local community. All German municipal constitutions stipulate that the municipal council itself must decide on certain issues of importance to the municipality, which means that it may not delegate these to other bodies. In North Rhine-Westphalia, for example, these include the adoption of the annual financial statements (GO NW).

Furthermore, the municipal council controls the activities of the municipal administration (Engels/ Krausnick 2015). While the municipal council has parallels to the legislative organization of other government levels, the municipality lacks the ability to enact parliamentary laws.

Municipalities are granted the ability to enact their own affairs by issuing legal statutes. They are obliged to enact certain statutes such as the municipal main statute, which regulates the constitution and its organization, and the budget statute in which it regulates how it implements its budget (Engels 2014, p. 394 sub seq.). The decision-making power with regard to the municipal budget lies with the elected representatives of the municipality. This holds for PB processes as well as for other forms of direct democratic decision-making, meaning that petitions and referenda cannot address budgetary issues.

Over the last decades, all *Länder* incorporated in their constitutions more or less far-reaching legal instruments for the direct participation of citizens, such as referenda and petitions, both at the state as well as at the municipal level (Mehr Demokratie e.V. 2020). The procedures for referenda and petitions are regulated very differently in detail in the *Länder*. For example, there are more or less extensive negative catalogues listing the political content that is excluded from

a petition. In all *Länder,* the question of a petition must be formulated in a way that it can be answered with "yes" or "no". In addition, in some *Länder*, petitioners are obliged to make proposals as to how the outcomes of a successful petition could be funded. In addition, a certain number of signatures is required so that a petition is permitted. In the *Länder*, the support quotas range from 2.5 to 15 % of citizens eligible for voting, depending on the size of the municipality. Thus depending on the regulations, it may be more or less easy for citizens to make use of referenda and petitions (Bogumil/ Holtkamp 2013, p. 31 sub seq.).

The division of tasks between *Land* and municipal level, and accordingly the scope and type of tasks accorded to municipalities, varies depending on the specific municipal constitution.
The scope of tasks depends on whether the municipality belongs to a district (dt. *kreisangehörig*) or if it is a district-free municipality (dt. *kreisfrei*). If the group of users for a certain public good or service is significantly larger than that of a single municipality but smaller than that of a *Land*, that task is carried out by the district (dt. *Landkreis*) for the municipalities that belong to that district. A large number of such tasks justify an additional regional level authority. Their scope of tasks includes maintaining district roads, landscaping, and emission protection. In addition, districts fulfil tasks that are delegated to them by the *Länder* level. Districts are the most important type of municipal associations in Germany. Additionally, there can be associations under the district level, if municipalities cooperate in providing a certain public good, as well as above the district level, in which case several districts and /or district-free municipalities cooperate (Zimmerman 2009, p. 90). Furthermore, associations and municipalities can provide certain public goods in an administrative union. Federal state legislation can also force them to form such a union, for instance in the case of waste disposal.
Districts in Germany are democratically legitimised as their representatives are subject to direct elections. However, they are not equipped with their own revenues. Instead they receive revenues only from the municipalities they are comprised of; thus hereafter in this thesis they will be treated as part of the local level that they form together with the municipalities. Larger urban municipalities are typically district-free and fulfil all local tasks on their own. Other special cases are the city states Berlin, Bremen and Hamburg. They fulfil not only all local authority tasks themselves but also the *Länder* tasks (Zimmermann 2009, p. 58 sub seq.).

The spectrum of tasks that municipalities in Germany carry out and the resulting expenditures are explained in more detail in the next section.

2.2.2 Municipal Finances – Tasks and Expenditure

This section first explains the tasks that municipalities fulfil in Germany in section 2.2.2.1. Section 2.2.2.2 then presents data about the resulting local expenditure.

2.2.2.1 Municipal Tasks

In this section, first the range of tasks municipalities fulfil is outlined and then the development of the resulting local expenditure is shown. A look at the local expenditure situation provides information about the degree of autonomy that municipalities have in defining their tasks or deciding their expenditure. This is important to know when considering the adoption of PB processes, because citizens should be able to discuss local expenditure within this process.

Municipalities form the lowest level in Germany's administrative structure. The federal government and the *Länder* allocate tasks and corresponding financial resources to them. However, municipalities are closest to the citizen and thus implement many of the regulations decided at the federal and *Länder* level.

The German GG states that local authorities can regulate all matters of the local community autonomously (Art. 28 (2) GG). Neither the GG, nor the *Länder* and municipal constitutions, give a more detailed description of which public tasks the municipal level should fulfil. Typical tasks range from public order like parking lot control or the use of public places for markets, fire brigades, school buildings, administrative staff, culture, sports facilities, green areas, cemeteries etc. Municipalities have to spend public money for childcare, schooling, social security, social and youth welfare. Furthermore, municipalities are usually responsible for basic services as water and energy supply and waste disposal. The tasks, that municipalities fulfil in the federal system of Germany, can be categorized according to their legal obligation for the municipalities into duties that belong to the "own sphere of activity" (dt. *eigener Wirkungskreis*), which can be further divided into obligatory and optional self-administration tasks and tasks that belong to the "transferred sphere of activity" (dt. *übertragener Wirkungskreis*) (Zimmermann/ Döring 2019, p. 113 sub seq./ Vesper 2015, p. 6 sub seq.). Table 2.1 illustrates these different types of tasks.

Table 1:Obligatory and Optional Tasks of Local Authorities

Type of Tasks		Examples
Tasks in municipality´s own sphere of activity	**Obligatory**	Municipal roads
		Building industry (e.g. issuing building permits - construction of a youth centre)
		Construction and maintenance of public roads, squares and residential streets
		Construction and maintenance of water and canal facilities
		Waste collection and disposal
		Construction and management of municipal housing
		School administration
		Adult education centres
		Issuing birth, marriage and death certificates
		Social benefits
	Optional	Sports facilities
		Museums
		Swimming pools
		Theatres and orchestras
		Youth homes
		Libraries
Tasks of transferred sphere of activity		Passport and registration
		Driving licences
		Traffic regulations
		Citizenship records
		Conducting elections

Source: Own depiction based on Zimmermann/ Döring 2019, Bogumil/ Holtkamp 2013.

Municipalities can carry out *tasks in their own sphere of activity* as their own responsibility. They do not have to comply with individual instructions or administrative regulations issued by state authorities (Art. 28 (2) GG).

Tasks of *the transferred sphere of activity*, on the other hand, comprise all those tasks which a law or statutory instrument assigns to the municipalities on behalf of the *Land*. Here the municipalities are subject to the instructions of the *Länder* authorities. (Zimmermann/ Döring 2019, p. 113 sub seq.)[4]

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[4] Regulated in the respective municipal constitutions.

Within the group of tasks that are in a municipalities' own sphere of activity, a further distinction can be made between obligatory and optional tasks. Municipalities are obliged to carry out the mandatory tasks, though they are free to choose how to perform them.

Mandatory tasks always have priority in expenditure planning. Among the voluntary tasks are mainly municipal offerings in the leisure and cultural area such as swimming pools, museums and green spaces. Business promotion is also part of this category of tasks.

In practice, the distribution of tasks between the federal and municipal level varies greatly depending on the respective municipal constitution. In some *Länder*, the municipalities are more intensively involved in the provision of public services than in others. A well-known and fiscally particularly relevant example of a task that is provided in some *Länder* through the state administration, and in others by local authorities, is the supra-local social assistance. According to article 3 para. 3 SGB XII the *Länder* decide who is responsible for the transfer. For example, the *Land* is responsible for integration assistance for people with disabilities according to the SGBXII in Brandenburg, Lower Saxony, Rhineland-Palatinate, the Saarland, Saxony-Anhalt, Schleswig-Holstein and Thuringia while municipalities have to provide this social assistance in the other nine *Länder*.

Depending on the proportion of optional and mandatory tasks, the degree of autonomy of the municipalities varies (Zimmermann/ Döring 2019, p. 114 sub seq.). The most freedom is given in the case of optional tasks. However, the share of this kind of tasks is shrinking. Over time, more and more tasks were assigned to the municipal level. Expenditures at the local level have been rising due to several federal reforms that has been shifted to them. This included especially the provision of social welfare by federal law.

The range of tasks resulting from these laws include:

- Benefits according to SGB II (especially costs for accommodation and heating),
- Benefits of youth welfare according to SGB VIII (especially child day care, youth work, educational assistance and taking into custody of children)
- Social assistance benefits according to SGB XII (especially assistance for care, health, special life situations and social benefits for people with disabilities, basic provision for old age and reduction in earning capacity)
- Benefits according to the Asylum Seekers Benefits Act (dt. *Asylbewerberleistungsgesetz*).

These reforms moved a larger share of the costs of social assistance to the municipal level. When considering social spending, municipalities are obliged to follow regulations set at the federal level and have very little discretion over these expenditures (Zimmermann 2009,

p.79/80). Due to the different range of tasks, local expenditure levels also vary between the municipalities. The next section gives an overview about current local expenditure in total and at *Länder* level.

2.2.2.2 Municipal Expenditure

The volume of tasks fulfilled by the local level determines the expenditures. The development of local expenditure shows how the composition of tasks has changed over time and which tasks have become more or less important. Table 2.2. shows the historical change in structure of tasks fulfilled by the municipal level.

Table 2: Expenditure of Municipalities and Municipal Associations by Task Area

	Expenditure 1913		Expenditure 1995		Expenditure 2005		Expenditure 2010		Expenditure 2019	
	Mio M	%	Mio DM	%	Mio €	%	Mio €	%	Mio €	%
General administration	280	**9.7**	13 369,7	**8.8**	15 601,1	**10.2**	24 460,3	**13.4**	52 787,6	**20.2**
Law enforcement	112	**3.9**	6 696,0	**4.4**	8 008,4	**5.2**	9 088,3	**5.0**		
Basic education	842	**29.3**	13 528,1	**8.9**	14 427,5	**9.4**	17 900,2	**9.8**	29 500,0	**11.3**
Science/ Culture	58	**2**	5 732,7	**3.8**	5 827,1	**3.8**	6 447,1	**3.5**		
Social benefits	209	**7.3**	48 337,4	**31,7**	54 420,2	**35.5**	67 037,2	**36.8**	108 613,3	**41.7**
Sports, recreation	291	**10.1**	7 875,7	**5.2**	7 174,7	**4.7**	8 040,4	**4.4**	8 520,5	**3.3**
Roads, paths	498	**17.3**	19 405,3	**12.7**	17 248,7	**11.3**	18 503,9	**10.2**		
Economic promotion, agriculture, traffic	81	**2.8**	19 249,0	**12.6**	14 732,8	**9.6**	14 523,5	**8.0**		
Other expenses	505	**17.6**	18 500,7	**12.1**	15 742,8	**10.3**	16 264,5	**8.9**	61 324,2	**23.5**
Total expenditure	2876	**100**	152 694,6	**100**	153 182,7	**100**	182 265,4	**100**	260 745,3	**100**

Source: Own depiction based on data by Zimmermann/ Döring 2019, p. 105 for 1913/1914; other periods: Stat. Bundesamt, Rechnungsergebnisse der kommunalen Haushalte.
Note: City states are not included, because this expenditure is counted at *Länder* level.

Examining the historical development of expenditure in table 2.2, a major shift in tasks can be noted. Over the years, the share of the remit "social security" grew continuously from 7.3 percent in 2013/14 to 41.7 percent in 2019. In the year 1913 the remit "Basic education" was the area with the largest expenditure share with a value of 29 percent. The share of this task was only 9.8 percent in 2010. After 2011, remits were newly defined and thus the data are only conditionally comparable. The local task "Basic education" was integrated into the task category "Science/ Culture". This category had a share of 11.3 percent in 2019. Summing the categories "Basic education" and "Science/ Culture" for these earlier periods, it is clear that the trend continued. Tasks concerning "Social security" have become much larger for municipalities while those related to schools have become less.

Furthermore, the share of the task category "Sports/ recreation" has become smaller over the last decades. The share was 10.1 percent in 1913/14 and only 3.3 percent in 2019.

Other areas remained quite constant over time, such as the task area "General administration". The increase in that value in 2019 is mostly due to a redefinition of the categories. The shares of the areas "Roads/ paths" and "Economic promotion, agriculture, traffic" also remained quite constant over the years. The increase in value in 2019 is mostly due to a redefinition of the task areas (Zimmermann/ Döring 2019, p. 106). Thus, the largest change in expenditure composition in this historical comparison is as follows: municipalities spend substantially more on social security and less on areas such as schools and recreation. The remit "Social benefits" is an area of responsibility which is heavily regulated by federal regulations, and municipalities have no autonomy here in carrying out these tasks. This shows that municipalities have lost autonomy in their tasks over the last decades and that the share of mandatory tasks has become larger than the share of optional tasks. Thus, the scope for action on municipal levels has decreased significantly. For the implementation of a PB process, that means that there is only a small part of the local budget where municipalities can make decisions autonomously.

This is reflected in the composition of municipal expenditures. Figure 3 shows municipal expenditure by type. The figure does not include the data for the districts. These are difficult to interpret, as the payments to the municipalities take up a significant share of their expenditure. On the other hand, the districts received most of their income from the municipalities. Thus, double counting could hardly be avoided.

Figure 3: Adjusted Expenditures by Expenditure Type (2018)
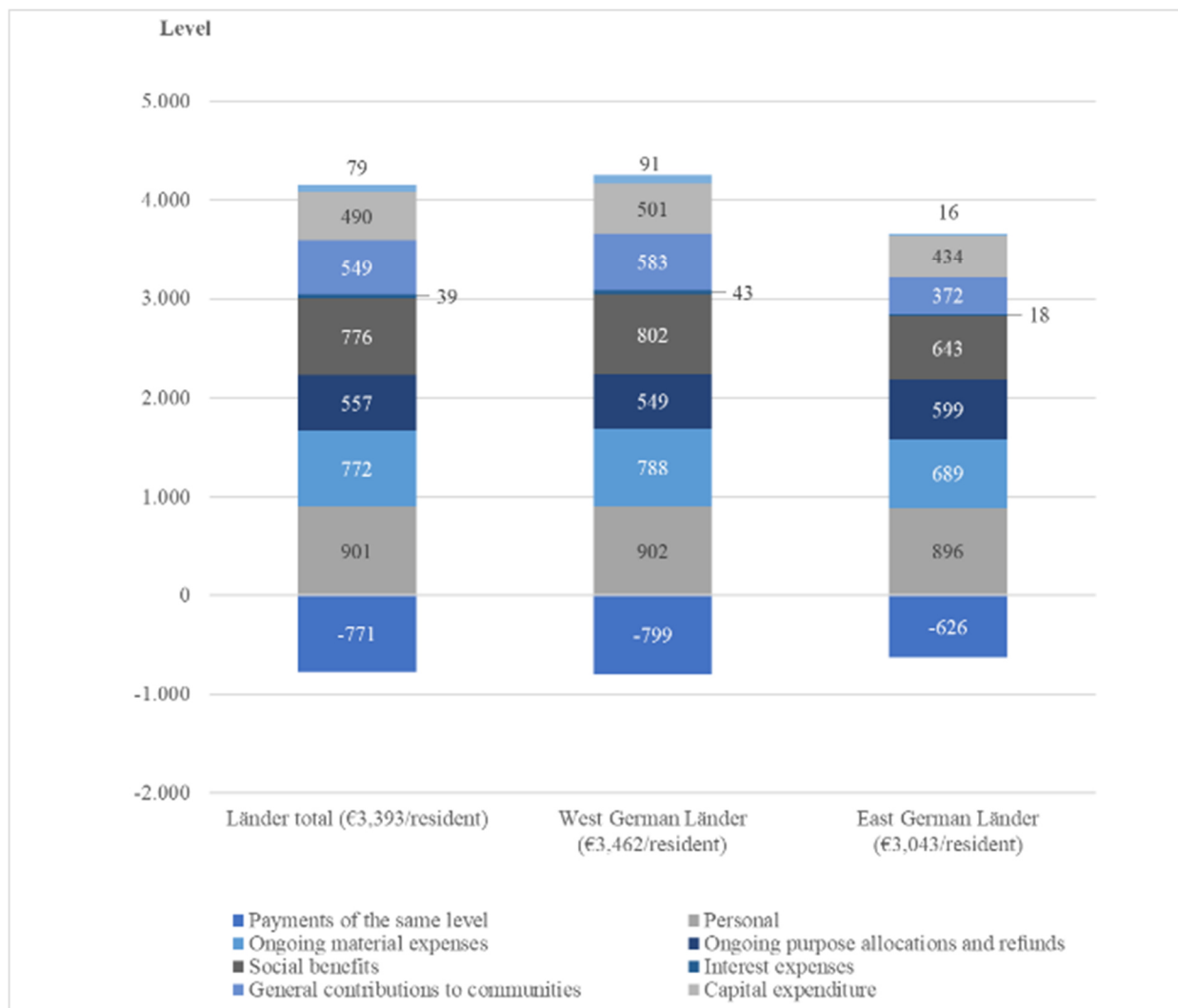
Source: Own figure based on Bertelsmann Stiftung 2019, p. 36.; data from the Statistisches Bundesamt (quarterly cash results of the municipal budgets).

The major item of expenditure is *Human Resources* with 901 euros per capita, taking up one third of all expenditure. This is followed by *social services* with 776 euros per capita and then *operating expenditures* with 772 euros per capita. The items *Human Resources* and *operating expenditures* constitute the most important means of production for municipal task provision. The *operating expenditure* includes expenditure on maintenance of movable and immovable property (land, buildings, vehicles), plus expenses for rents leases and other administrative and operating expenses associated with municipal tasks.

Fourth comes *funds for current expenses* (dt. *Zuweisungen für laufende Zwecke*). This expenditure item includes subsidies to municipal or private companies, plus allocations and grants to charities or other organisations providing services on behalf of the municipality (e.g. in youth

welfare). This is the only expenditure item for which municipalities in Eastern Germany spend more than municipalities in Western Germany.

The fifth largest item considering all municipalities is *general funds to municipalities* These are payments by the municipalities to their districts or associations.

Expenditure for *investment* is rather low with 490 euros per capita. Payments for *interest rates* are the lowest expenditure item.

The range of tasks and thus expenditure varies for municipalities in different *Länder*. This leads to very different expenditure levels at the local level. Figure 4 shows the total expenditures per capita by *Länder*.

Figure 4: Adjusted Total Expenditure, 2018 in Euro per Resident
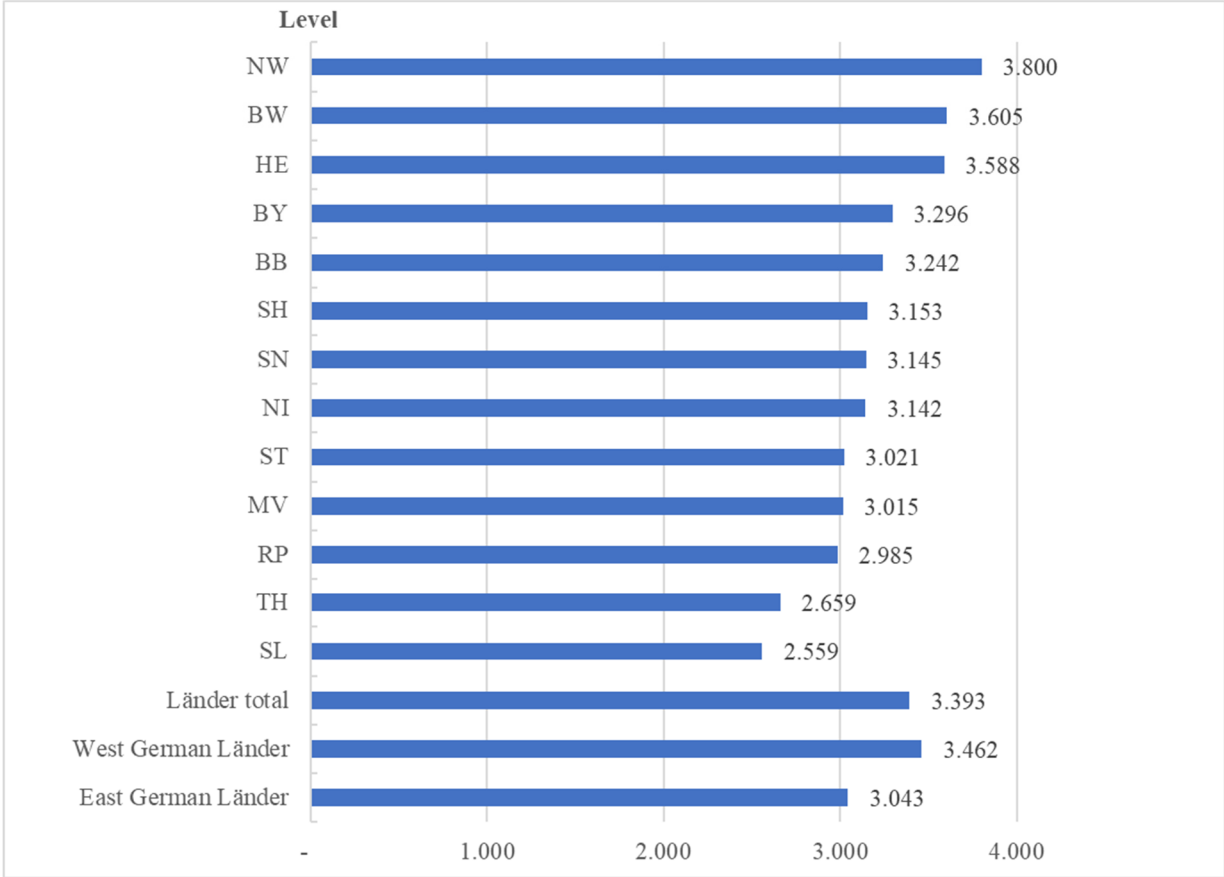
Source: Own figure based on Bertelsmann Stiftung 2019, p.33; data from the Statistisches Bundesamt (quarterly cash results of the municipal core and additional budgets).

In three *Länder* (North Rhine-Westphalia, Baden-Wuerttemberg and Hesse), total municipal expenditure in 2018 was well over 3,000 euros per inhabitant. In the majority of *Länder* (Bavaria, Brandenburg, Schleswig-Holstein, Mecklenburg-Western Pomerania, Lower Saxony, Saxony, Rhineland-Palatinate and Saxony-Anhalt), municipal spending was between 2,800 and just over

3,000 euros per inhabitant. Municipalities in the Saarland and in Thüringen were characterized by the lowest per capita expenditure in 2018. Here, the per capita expenditure was only just over 2,500 Euros per inhabitant. Looking at total expenditure per capita, the difference between the highest value (3,800) and the lowest value (2,559) is 1,241 euros per capita.

The range is even larger when looking at selected expenditure items. As mentioned before, the differences are particularly large when considering the expenditure item *social services*. Figure 5 shows the expenditure for *social services* per capita by *Land* in 2018.

Figure 5: Social Benefits, 2018 in Euro per resident
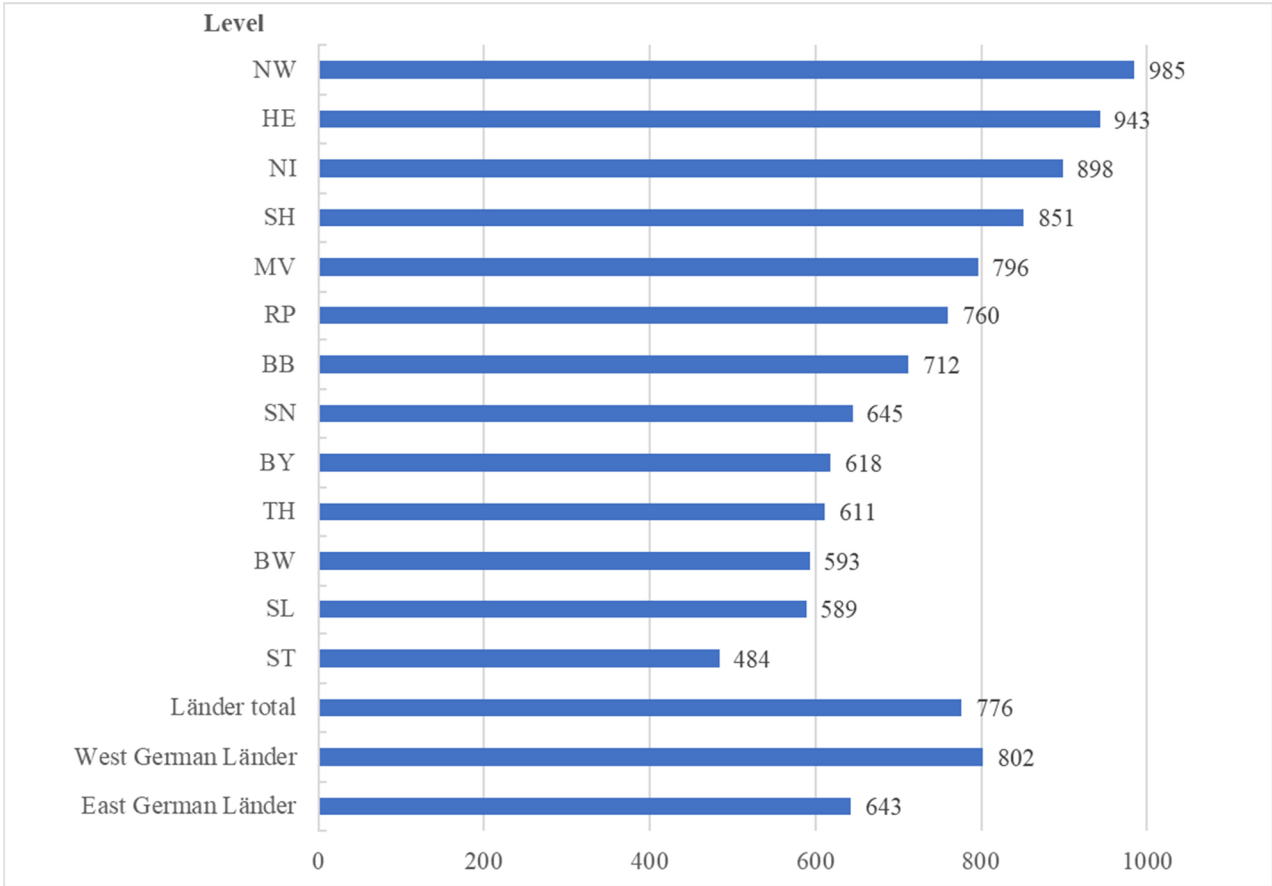
Source: Own figure based on Bertelsmann Stiftung 2019, p. 41; data from the Statistsiches Bundesamt (quarterly cash results of the municipal core and additional budgets).

On average, municipalities spend 776 euros per capita for *social services*. The largest values have municipalities in North Rhine-Westphalia with 985 euros per capita. The lowest expenditure of 484 euros per capita is found in Saxony-Anhalt. Thus, municipalities in North Rhine-Westphalia spend twice as much for social services compared to municipalities in Saxony-Anhalt. Among the

Western German *Länder,* Bavaria, Baden-Wurttemberg and Saarland have the lowest *social service* expenditure per capita. Hesse, Lower Saxony, and Schleswig-Holstein are the *Länder* in which municipalities are characterized by high social expenditure. Comparing West and East Germany, Western German *Länder* have on average higher *social service* expenditure with 802 euros per capita compared to 643 euros per capita in the Eastern German *Länder.*

Expenditure for *investment* takes up only a small share of total expenditure when considering all *Länder*. Differences in the expenses for investments are an indicator for the financial situation of a municipality and their possibilities of doing local politics. Municipalities in a financially difficult situation will not be able to invest in their municipalities' infrastructure, so their scope of action is limited. Figure 6 shows the expenses for investments per capita by *Land* in 2018.

Figure 6: Capital Expenditure, 2018 in Euro per Resident
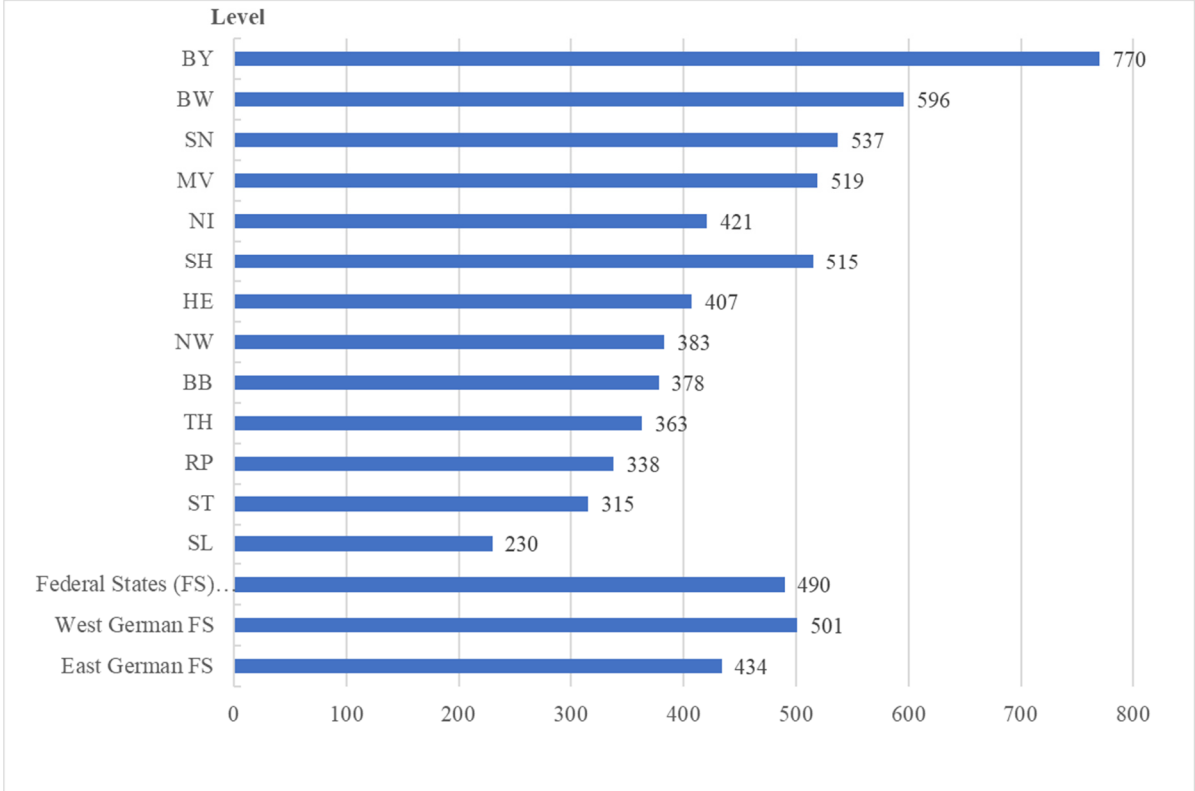
Source: Own figure based on Bertelsmann Stiftung 2019, p. 44; data from the Statistisches Bundesamt (quarterly cash results of the municipal core and additional budgets).

When looking at the investment spending of the municipalities by *Land*, municipalities in Bavaria stand out as having by far the highest expenditure for investments with 770 euros per capita. In comparison, municipalities in Saarland are at the bottom of the list with only 230 euros per capita, which is only one third of the investment expenditure in Bavaria. Among Western German *Län-*

der, Baden-Wurttemberg (596) and Schleswig-Holstein (515) have above average investment expenditure per capita. Among the Eastern German *Länder*, municipalities in Sachsen-Anhalt (537) and Mecklenburg-Western Pomerania (519) have the largest expenditure for investments. Lower Saxony and Hesse still have above 400 euros per capita investments expenditure. Municipalities in North Rhine-Westphalia, Brandenburg, Thuringia and Rhineland-Palatinate have less than 400 euros per capita investment expenditure.

The data show that municipalities in different *Länder* face very different local circumstances and have varying abilities to take political action, which can also affect the adoption of a PB process.

This difference in the scope of tasks assigned to different municipalities must be taken into account when comparing financial data between the municipalities. One possibility to measure and compare these differences is the communalisation rate. This provides information about the division of tasks between the federal state and the municipal level and shows the share of expenditure taken on by the municipalities compared to the *Länder* level. The higher the communalisation rate is, the more tasks are delegated to the municipalities.

Figure 7: Communalisation Rate Expenditure, 2017 in Percentage (Net Expenditure)
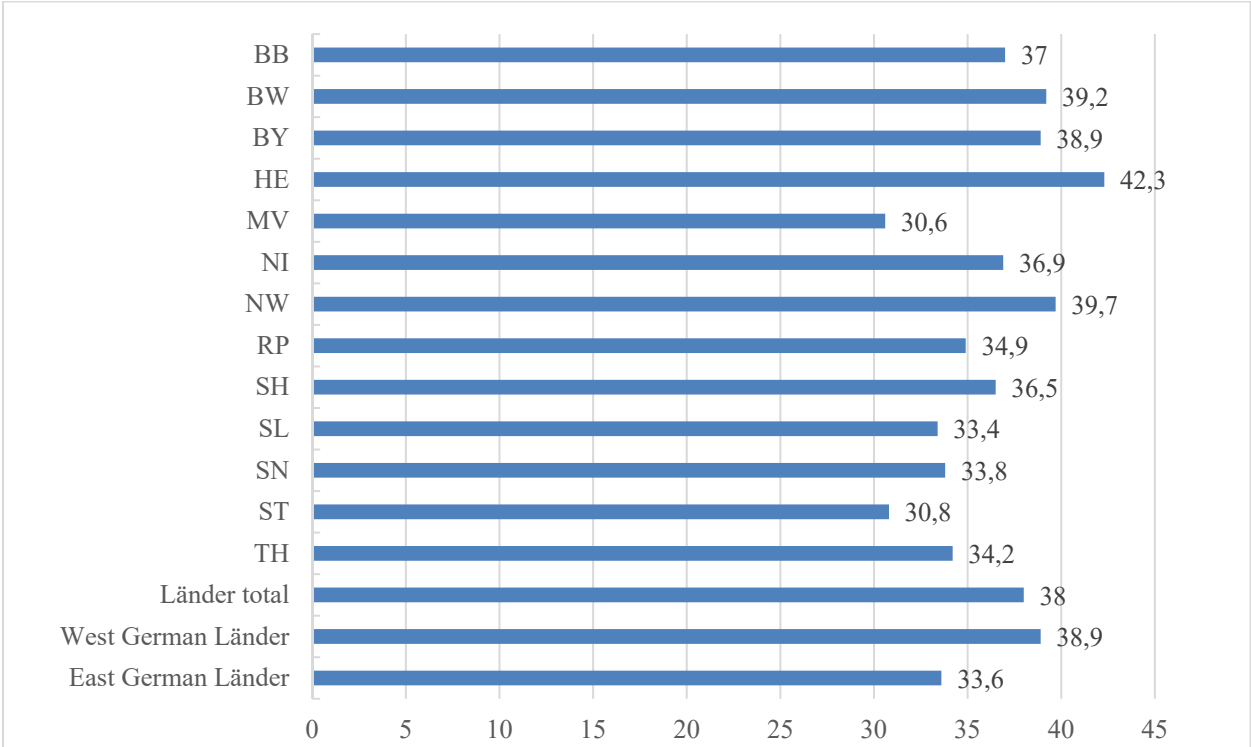
Source: Own figure based on Bertelsmann Stiftung 2019, p. 10.

The degree of communalisation of expenditure ranged from 30.6 percent to 42.3 per cent in 2017. The communalisation rate was highest in Hesse (42.3) followed by North Rhine-Westphalia (39.7 percent), Baden-Württemberg (39.2 percent) and Bavaria (38.9 percent). In these *Länder*, more public tasks are carried out by the municipalities compared to those of other *Länder.*

The lowest communalisation rate had municipalities in Mecklenburg-Western Pomerania (30.6 percent) and Saxony-Anhalt (30.8 percent).

Comparing the average rate between Western and Eastern Germany, the communalisation rate in the Western German *Länder* is with 38.9 per cent well above the average of the Eastern German *Länder* with 33.6 percent.

As there are clear differences in the division of tasks between the municipal and *Länder* level, it is important to analyse whether the communalisation rate influences the adoption of PB. This will be discussed further in Chapters 4 and 5.

The next section gives an overview of the municipal revenues which are used to finance the public tasks discussed above.

2.2.3 Municipal Finances – Revenues

This section explains municipal revenues. It is divided into section 2.2.3.1, which introduces the different revenue categories for German municipalities, and section 2.2.3.2, which presents data on municipal revenue.

2.2.3.1 Municipal Revenue Categories

The municipal expenditure aspect of finances having been outlined in the previous section, this section will describe those sources from which German municipalities generate their revenues. Principally, municipalities receive revenues from the following categories of income source:

- Special charges,
- taxes in their own authority and a proportion of federal taxes,
- general and conditional grants from the *Länder* and federal level,
- financial income including other administrative and operating income, profit shares, concession fees, interest income (Zimmermann/ Döring 2019).

Special Charges

Local authorities have to follow certain principles with regard to how they raise revenues. Under these principles, revenues have to be raised primarily by levying special charges. Special charges are fees that have to be paid by citizens to the municipality for certain services and facilities they provide as entrance fees for baths, community colleges or the civil ceremony. Subsequently, taxes have to be used a revenue sources if "other sources of revenue (including transfers from reserves, cost reimbursements and general fiscal grants from the *Länder*) are not enough. Last, local municipalities may borrow only if funds cannot be obtained in any other way or if other methods of financing would prove uneconomical" (Bundesministerium der Finanzen 2021, p. 58).

Special charges should be their first choice of income as they have the advantage that they comply with the benefit principle, meaning that the charges are paid for a service that is used in return. Thus, they have a similar effect as prices in private markets and can efficiently control the demand and provision of the provided public service and goods. A further advantage is that they offer a high degree of autonomy to the municipality. Finally, special charges are less anonymous than taxes and allow citizens to comprehend which public service they are paying for. Therefore, they find higher acceptance and can increase the bond between a municipality and its citizens (Zimmermann/ Döring 2019, p. 121 sub seq.).

Income from taxes

Despite the advantages of special charges, the revenue from taxes is in fact the most important source of income for municipalities (see figure 2.8). Municipalities receive income from different taxes. As already mentioned in section 2.1.2.1, the GG contains regulations concerning the distribution of tax revenues between the state levels. In practise, the distribution of taxes between the state levels has become progressively more complex.

In general, tax revenue is either assigned according to a system of separate apportionment (*Trennsystem)*, under which public revenue is assigned to an individual government level, or according to a system of shared apportionment (*Verbundsystem)* (Bundesministerium der Finanzen 2021, p. 16 su seq.).

Figure 8 illustrates how taxes in the German federal system are shared and shows how municipalities receive income.

Figure 8: Tax System of Germany

The tax system and the distribution of tax revenue between the Federation, Länder and municipalities

Assignment of revenue under the system of "separate apportionment" – i. e. where revenue is apportioned to a single government level (Article 106 GG)

Assignment of revenue under the system of shared apportionment (joint taxes):

Surcharge tax system

free

Regulated

With tax design possibilities

Without tax design possibilities

All tax design possibilities

Only equipped with the option to define a rate of assessment

Examples for taxes assigned to the municipalities

Dog Tax

Real property Tax

Income Tax

Option to levy an additional charge on income tax (Art.. 106 (5) GG)

Source: Own illustration based on Zimmermann 2009, p. 134 and Zimmermann/ Henke/ Broer 2005, p.259.

Under the system of separate apportionment, a local authority would be entitled to the full yield of a tax type. In an extreme form that could be in the form of a totally competitive system, meaning that local authorities could decide about the type of tax base and the tax rate autonomously. In the German federal system, local authorities do not have any tax revenue from such a system.

A milder form is the bound system of separate apportionment (dt: *gebundenes Trennsystem).* In that system, local authorities receive the revenue from a certain type of tax, but they cannot decide about the type of tax. In this system, for some taxes, the local level has the authority of deciding about the type of tax and the collection rate. Examples in Germany are smaller local taxes such as beverage tax, entertainment tax or dog tax (Art.106 (6) GG).

There are certain taxes for which local authorities can decide only the tax rate. Under this system, German municipalities receive revenue from the local trade tax and from the property taxes on real estate (Art.106 (6) GG). The local council can independently decide about the tax collection rate. The rate selected is binding for the whole budget year. The rate can be changed on a yearly basis but not in the ongoing budget year. There is no upper bound for the tax rate, but there exist a lower bound rate since 2004 (Zimmermann 2009, pp. 112). The largest parts of the local trade tax revenue is directly due to the municipalities. As part of the federal equalization scheme, a small portion goes to the other government levels (Bundesministerium der Finanzen 2020, p. 42 sub seq.).

In the system of shared apportionment revenues, municipalities receive income in the form of the joint taxes. As already explained in section 2.1.2.2 that includes income from the income tax (including wage tax), from the final withholding tax on interest and capital gains, and from the value added tax.

Table 3 summarizes the income stemming from tax revenues, that the municipal level in Germany receives.

The local authorities receive 15% of the income tax (Art. 106 (3) GG and section 1 of the Local Authority Finance Reform Act (dt. *Gemeindefinanzreformgesetz*); 12% from the *final withholding tax on interest and capital gains* (dt. *Abgeltungsteuer auf Zins- und Veräußerungserträge, tr*anslation of Bundesministerium der Finanzen 2021 p. 16) and approx. 2 percent of the value added tax (*Finanzausgleichsgesetz § 1 Anteile von Bund und Ländern an der Umsatzsteuer*).

Furthermore, the local authorities generate tax revenues from local excise taxes such as the dog tax, the property taxes and the trade tax. From that they must transfer around 9 percent to the *Länder* level and around 3 percent to the federal level (Bundesministerium der Finanzen 2021, p. 57).

Table 3: Division of Tax Revenue (in %)

Type of tax	Municipalities	*Länder*	Federation
Income tax	15	42,5	42,5
Value added tax[1]	2	45	53
Final withholding tax on interest and capital gains	12	44	44
Trade tax[2]	89	9	3
Property tax A	100		
Property tax B	100		
Local excise and expense taxes (dog tax, hunting tax, horse tax, entertainment tax, hotel tax)	100		

Source: Own illustration, based on data from Bundesministerium der Finanzen 2021
 Details see FAG § 1
[2] Based on data from Statistisches Bundesamt, Fachserie 14, Reihe 2, 1.-3. Vj 2019, municipalities are obliged to pay a local business tax apportionment to the Federation and *Länder*.

The surcharge system (dt. *Zuschlagssystem*) is a system where both the type of tax and the collection rate are determined at federal level. Other government levels have the option to levy the taxes

with a surcharge. However, there has not been any use of that option in practice (Zimmermann/
Döring 2019, p. 147).

Fiscal Grants

In addition to special charges and taxes, fiscal grants are another important source of revenue for municipalities. These are intended to function as fiscal equalizers, levelling out differences between richer and poorer municipalities.

Under Article 106 (7, first sentence) GG, a portion of the *Länder* share of revenue from joint taxes must be transferred to the municipal level and associations of municipalities (referred to as "obligatory revenue-sharing") (Bundesministerium der Finanzen 2021, p. 61).

The municipal fiscal equalization is based on a *Länder* law named the "Fiscal Equalisation Law" (dt. *Finanzausgleichsgesetz, FAG)* and "municipal financing law" (dt. *Gemeindefinanzierungsgesetz)*.

The execution of the fiscal equalisation is partly based on *Länder* law (Art. 8 (2) FAG). The details are regulated in the respective fiscal equalization laws passed by the *Länder*. Thus, the process varies greatly between the different *Länder*. However, some common aspects of how the equalisation is executed have evolved.

In a first step of the fiscal equalisation, the total amount of funds (dt. *Verbundmasse*) provided for the fiscal equalisation is calculated. It is calculated as the percentage share of *Länder* revenue in joint taxes, in some cases also in certain *Land* taxes or in the *Länder* fiscal equalisation system. In many *Länder*, this amount is initially divided into fixed partial amounts, such that the amount of funds is separated for municipalities belonging to a district, independent cities and districts.

Secondly, the tax power (dt. *Steuerkraft)* for each municipality is determined. This is calculated from the tax revenue per capita. Taxes that are subject to a tax rate like the local trade tax and real property tax are standardized to a fictitious, uniform tax rate (so-called reference tax rate).

Thirdly, this tax power is compared with the financial requirements per capita.

For this, the fiscal needs of individual municipalities must be calculated. As municipalities are entitled to self-government, local conditions can vary greatly, and thus the fiscal need of each municipality cannot be calculated precisely. Hence, each *Land* follows a standardised procedure to calculate the fiscal needs of individual municipalities. This contains the use of various apportionment factors, which together sum up to a "total apportionment factor" (Bundesministerium der Finanzen 2021, p. 62). Next to the "total apportionment factor, there are factors called "supplementary apportionment factors" which are supposed to consider specific municipal circumstances

like population growth, schools, social welfare costs, military bases and roads (Bundesministerium der Finanzen 2021, p. 62, Zimmermann/ Döring 2019, p. 282 sub seq.)

The fourth step in the municipal equalisation system is to calculate the difference between financial strength and financial needs for each municipality. A municipality with an average tax burden receives the average key allocation per resident (dt. *Schlüsselzuweisung*). A relatively tax-weak municipality receives more; a tax-strong municipality receives less than the average per capita allocation. For most municipalities the financial requirement is higher than the tax power, so that they are entitled to a compensation. Thus, the equalisation system in Germany is a vertical equalisation with a horizontal effect.

If both amounts are equal or if the financial power is higher, the municipality does not receive any compensation, but in most *Länder* it does not have to give anything either. Hence there is no horizontal financial equalisation among the municipalities in these states.

The allocations calculated in this way reach the municipalities as general grants. They are not tied to a special purpose.

In some *Länder*, a small part of the overall fund is reserved for municipalities in budgetary difficulties, for example where the budget has not been balanced for several successive years. These funds are allocated on request as so-called deficit or need allocations (dt. *Fehlbetragszuweisungen*). In addition, each federal state has *Länder* specific regulations. In Schleswig-Holstein, for example, there are special grants that supplement the usual general grants. In addition, each federal state also pays funds to the municipalities outside the municipal financial equalisation system, for example within the framework of support programmes (Zimmermann/ Döring 2019, p. 285 sub seq.).

In the next section, figures of municipal revenues are shown.

2.2.3.2 Municipal Revenue – Data

This section shows data for the different source of income for local authorities in Germany.

Figure 9 shows the municipal revenues from different types of revenue sources in 2018.

Figure 9: Adjusted Income By Type, 2018 in Euro per Resident
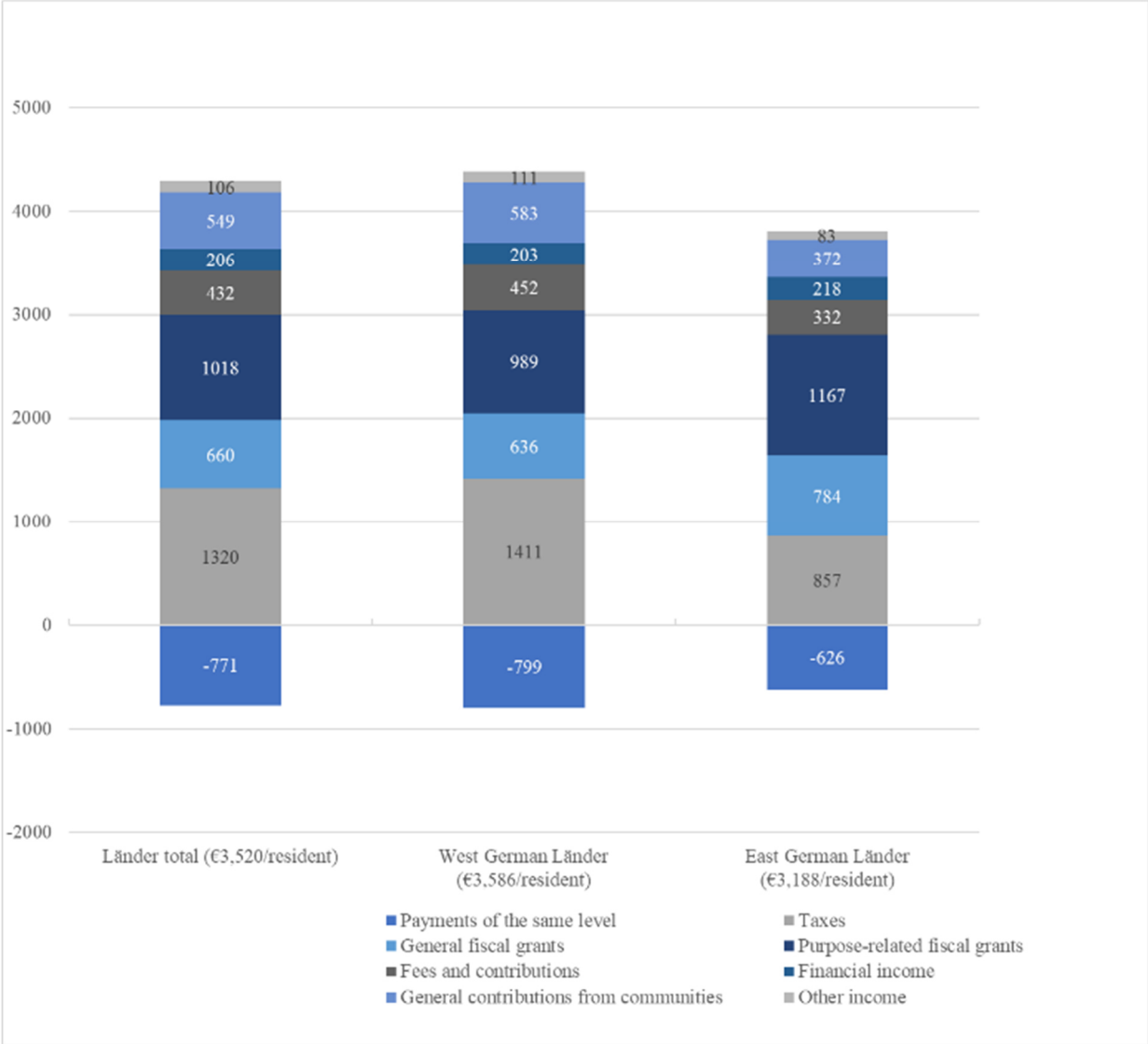
Source: Own figure, based on Bertelsmann Stiftung 2019, p. 26; data from the Statistisches Bundesamt (quarterly cash results of the municipal budgets).

Looking at the average of the *Länder*, income from *taxes* made up the largest part of municipal income, with an average of 1,320 euros per resident. This accounts for 30.8 percent of all municipal income. This is followed by *purpose-related fiscal grants* with 1,018 euros per resident (23.7 percent) and *general fiscal grants* with 660 euros per inhabitant or 15.4 percent. Income from *special charges* only accounts for 10.1 percent of the municipal income. Finally, the share from *financial income* is a small part (5.8 percent) of overall municipal income.

There are large differences in the income structure between *Länder* in Western and Eastern Germany. In the Western German *Länder* income from *taxes* is the most important source of

income in 2018, with 1,411 euros per resident. In the Eastern German *Länder*, the most important revenue sources are *purpose-related fiscal grants*. For Western German *Länder*, these are the second most important source of income.

Figures 10 to 12 show income from selected categories at *Länder* level.

Figure 10: Tax Revenue (net), 2018
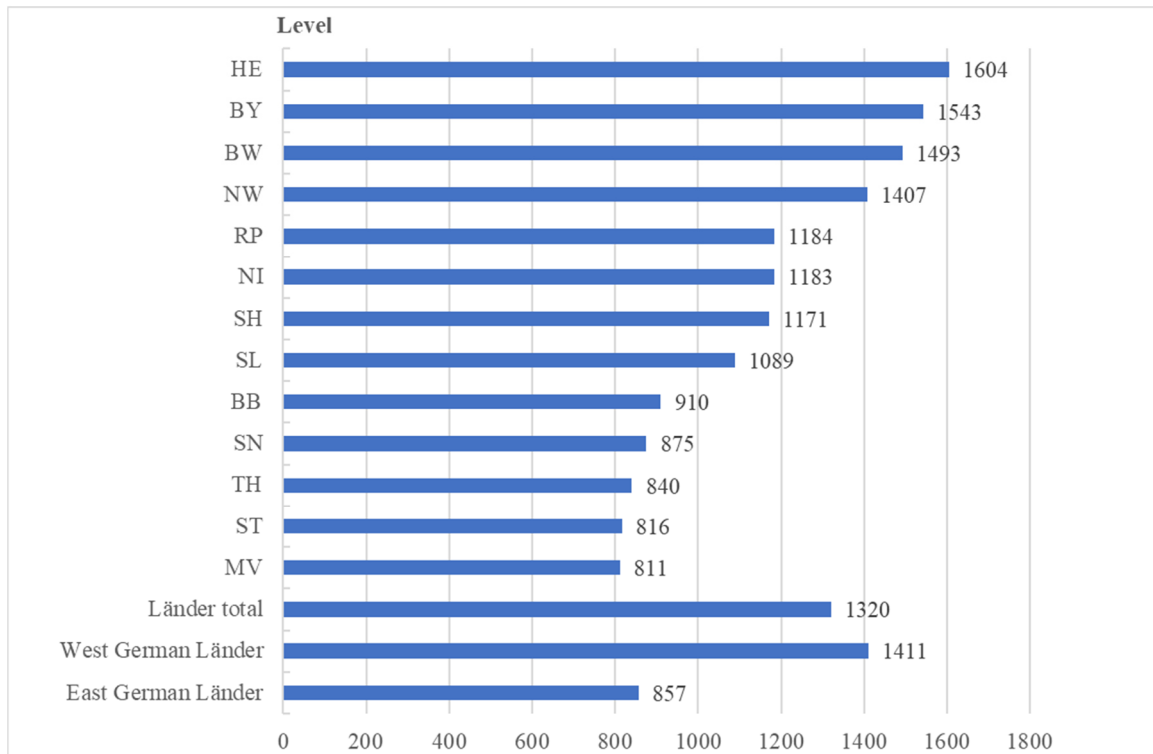
Source: Own figure based on Bertelsmann Stiftung 2019, p.27; data from the Statistisches Bundesamt (quarterly cash results of the municipal core and additional budgets).

Figure 10 shows the total income from taxes on *Länder* level. The income range ranges from 811 euros per resident in Mecklenburg-Western Pomerania up to 1,604 euros per resident in Hesse; the Hessian municipalities thus have almost twice as much tax revenue as the municipalities in Mecklenburg-Western Pomerania.

Municipalities in Southern German *Länder* (Hesse, Bavaria and Baden-Württemberg) have the largest values when it comes to income from taxes, followed by the municipalities of North Rhine-Westphalia.

Among the other West German *Länder,* municipalities in Saarland have the lowest income from taxes (1,089). However, they still have significantly higher tax income than municipalities in East Germany. There, income from taxes ranges from 811 in Mecklenburg-Western Pomerania to 910 euros per resident in Brandenburg. The missing income from taxes in the East German municipalities is balanced by a larger share of income from fiscal grants.

Figure 11 shows the income received from general fiscal grant by federal state in 2018.

Figure 11: General Fiscal Grants, 2018
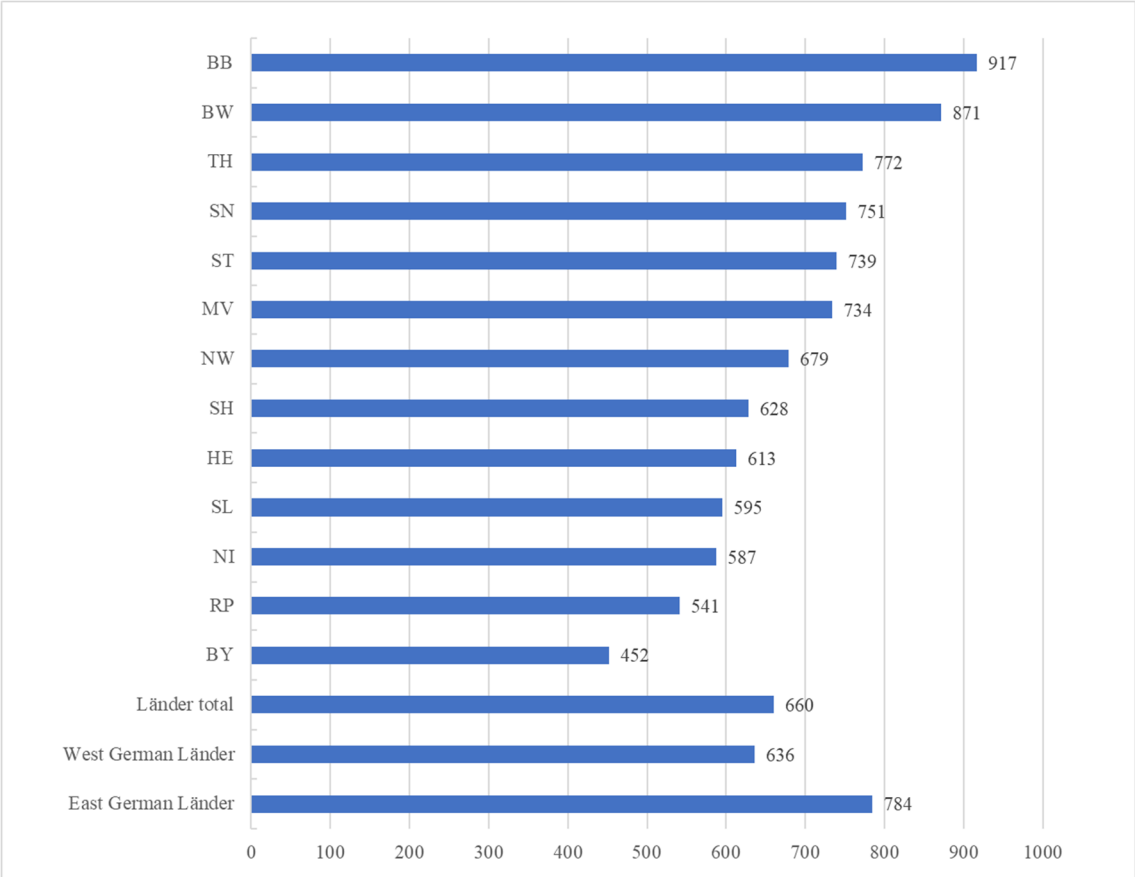
Source: Own figure based on Bertelsmann Stiftung 2019, p. 29; data from the Statitisches Bundesamt (quarterly cash results of the municipal core and additional budgets).

Figure 11 shows that municipalities in East German *Länder* are at the top of the list when it comes to income from general fiscal grants. One exception is the West German *Land* Baden-Wurttemberg, with a high value of 871 Euros fiscal grants per capita. However, this is mostly because of the *Finanzausgleichsumlage.* Baden-Wuerttemberg has been charging its districts and municipalities a financial equalization levy since 1973. The size of the levy depends on the tax power of the respective municipality and its fiscal needs (Art. (7) FAG Baden Wurttemberg). This levy is mostly used for municipal fiscal equalization. Thus, it has a horizontal component as it comprises payments from municipalities to municipalities.

Following the municipalities in the East German *Länder* and in Baden-Wuerttemberg, municipalities in North Rhine-Westphalia have the highest per capita income from general fiscal grants with 697 euros per capita.

Municipalities in the other West German *Länder* have an income from general grants between 500 and 600 euros per capita. Municipalities in Bavaria receive the lowest amount of general fiscal grants with 452 euros per capita.

Figure 12 shows the income from special charges in 2018.

Figure 12: Fees and Contributions (2018)
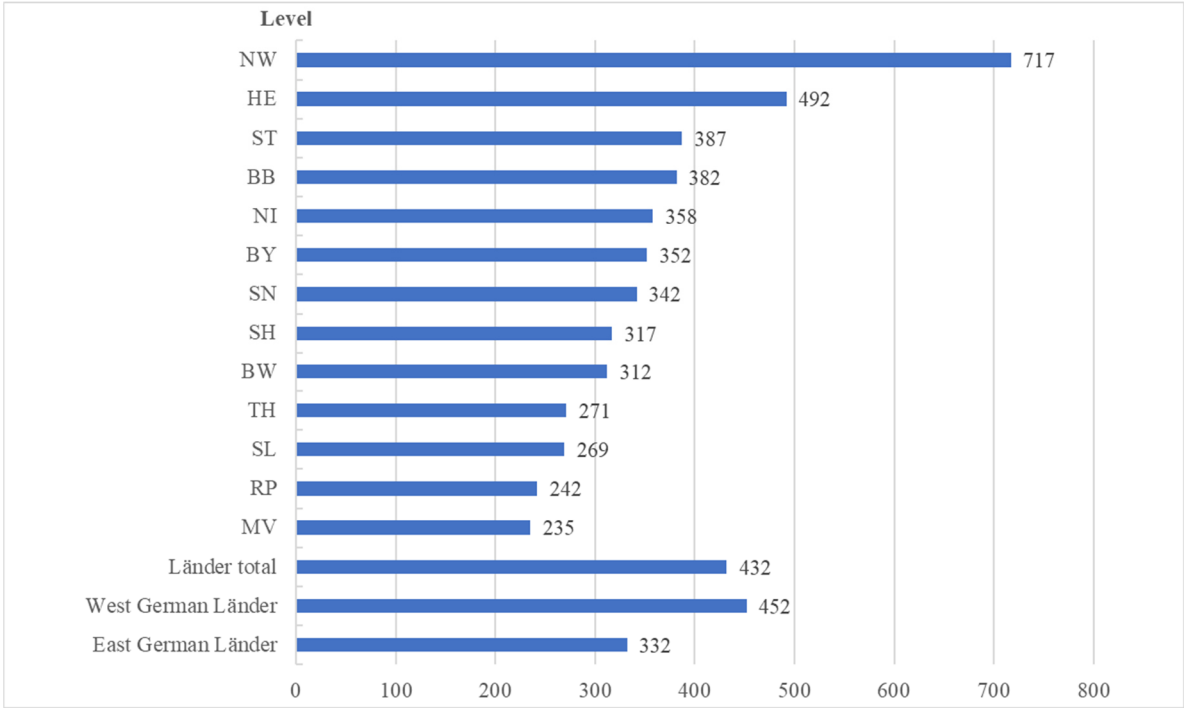
Source: Own figure based on Bertelsmann Stiftung 2019, p. 31; data from the Statitisches Bundesamt (quarterly cash results of the municipal core and additional budgets).

Revenues from fees and contributions (including specific levies) were highest in North Rhine-Westphalia, with 717 euros per resident, and lowest in Mecklenburg-Western Pomerania, with 235 euros per resident. The high income from special charges in North Rhine-Westphalia is caused by many municipalities in budgetary crisis. These municipalities are forced to increase special charges as part of their plan to balance their budgets. Municipalities in Hesse have the second largest income from special charges with 429 euros per capita. Many municipalities had to increase fees in order to achieve balanced budgets.

They are followed by a group of municipalities from *Länder* with special charges between 312 and 387 euros per capita (Brandenburg, Lower Saxony, Bavaria, Schleswig-Holstein, Saxony, Baden-Wuerttemberg). Municipalities in Thuringia, Saarland, Rhineland-Palatinate and Mecklenburg-Western Pomerania have income from special charges under 300 euros per capita.

This data shows differences in municipal income resulting from different economic and financial backgrounds in the German *Länder*. Evidently, municipalities in Eastern Germany still face structural problems resulting in less income from taxes, which is counterbalanced by higher income from fiscal grants.

Another way for municipalities to receive income is through borrowing, which is discussed in the next section.

2.2.4 Income from Debt

This section explains the options for public borrowing that are available to municipalities. Section 2.2.4.1 explains the legal basis of borrowing and section 2.2.4.2 presents data of municipal debt in recent years.

2.2.4.1 Legal Considerations

Municipalities have the possibility of borrowing. However, borrowing is considered a controversial source of income because of concerns around interest rates and repayment. The *Länder* level has extensive supervisory powers. Municipal borrowing must be approved by the supervisory authority of the *Länder*.

First, the legal framework concerning local borrowing is described in this section; then, the situation of municipal debt in Germany is shown. After that, the debt situation of German municipalities is presented.

A very important rule of public budget law is budget balance. This is already derived from Article 100 GG and can be found in all municipal constitutions. Budgetary balance is regarded as an important criterion for maintaining the long-term performance of local authorities. It is intended to prevent the municipalities from accumulating budget deficits over the years, as such deficits might ultimately limit their scope for action in the future. In a very general definition, budgetary balance is achieved when the revenue in any given financial year is equal to expenditure (Geißler 2009).

In a cash-based accounting system, the budget is considered to be balanced if the total amount of revenue does not exceed the total amount of expenditure in the administrative budget and if, in addition, a surplus could be transferred to the capital budget. In the accrual-based accounting system, the budget balancing concept refers to the operating result plan, since current income and expenses are recorded there. Some *Länder* also include the fiscal budget in the rules for a

balanced budget in order to guarantee the liquidity of the municipalities with regard to repayments on local debt (Geißler 2009, p.10).

Based on this premise of balanced budgets, municipalities are only supposed to borrow if other ways of financing are not possible or are not economical (Zimmermann 2009, p. 201).

As municipalities in Germany cannot go bankrupt, the *Länder* are ultimately responsible for ensuring the financial solvency of the municipalities; it thus follows that municipal borrowing must be approved by local government supervision (Zimmermann 2009, p. 202, Rehm/ Tholen 2008).

Länder have several ways to combat excessive borrowing (Zimmermann 2009, p. 202). The actual procedure of the local municipal surveillance system ranges from more supervision rights of the *Länder* level when the financial situation of a municipality gets worse, to a loss of the right of municipal self-government for the time of insolvency. (Gröpl/ Heinemann/ Kalb 2010, p. 187).

Whether a municipality is considered bankrupt or over-indebted varies depending on the municipal constitution in question. In the municipal constitution of e.g. North-Rhine Westphalia, a municipality is considered over-indebted if permanent deficits decrease the equity (Geißler 2009, Bertelsmann Stiftung 2019, p.142). A number of mechanisms have been introduced to avoid reaching this state of over-indebtedness. The rejection of the budget by the *Länder* budget supervisory agency is the most common sanctioning mechanism.

If the municipality can no longer balance its budget, it must draw up a budget protection concept (dt. *Haushaltssicherungskonzept*) in most *Länder*. At what point exactly a municipality is obliged to present a budget protection concept varies across the *Länder*.[5] In North-Rhine Westphalia, for example, a municipality must set up a protection concept if the general reserve is reduced by more than 25 percent within one financial year, or if the general reserve is reduced by more than 5 percent in each of two subsequent financial years, or if the general reserve is used up (Art. 76 GO NW).

The budget protection concept should contain a plan on how to eliminate the causes of the deficits and how to achieve a sustainable balanced budget. It should list in detail which measures are planned to increase local revenue and which measures are foreseen to cut public expenditure and thus to consolidate the budget.

The budget protection concept is to be decided by the municipal council and submitted to the supervisory authority. Despite substantial recommendations on its content, the decision on the

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[5] With the exception of Bavaria, Brandenburg, Rhineland-Palatinate and Schleswig-Holstein. For a detailed presentation of regulations by individal *Land*, see Geißler 2009.

measures and consolidation contributions contained therein is formally taken in the municipality itself. It refers to the current budget, must be updated annually if necessary, and is linked to the medium-term financial planning (Geißler 2009, p.13).

A much more severe cut in the right of self-governance of the municipality can occur if a budgetary protection concept is not approved. In that case, provisional budgetary arrangements will enter into force. If no convincing concept to create a balanced budget can be provided for several periods, a municipality operates under emergency budget law. This restricts self-government, especially in the area of optional tasks. In this case, an affected municipality can only perform tasks to which it is legally obliged or whose continuation cannot be postponed.

An even more severe sanction is the dismissal of the local administration and the appointment of a savings commissioner (dt. *Sparkommissar*) who will take measures to reach budgetary compensation.

In summary, municipalities are required to balance their budget, and unbalanced budgets are associated with severe restrictions to a municipality´s right of self-administration.

Despite this, some German municipalities have faced difficulties in achieving budget balance for years. The next section shows the development of local debt in recent years.

2.2.4.2 Development of Municipal Debt

Before the debt situation of the municipal budgets is considered at *Länder* level, the development of the overall municipal debt level is shown, starting from the outbreak of the financial crisis in 2008.

Figure 13 shows the development of total municipal debt between 2008 and 2021. In the first quarter of 2021, the municipal debt amounted to around 134 billion euros.

Figure 13: Aggregated Debt Level of Municipalities in Germany 2008 to 2021 (Euro/ Billions)
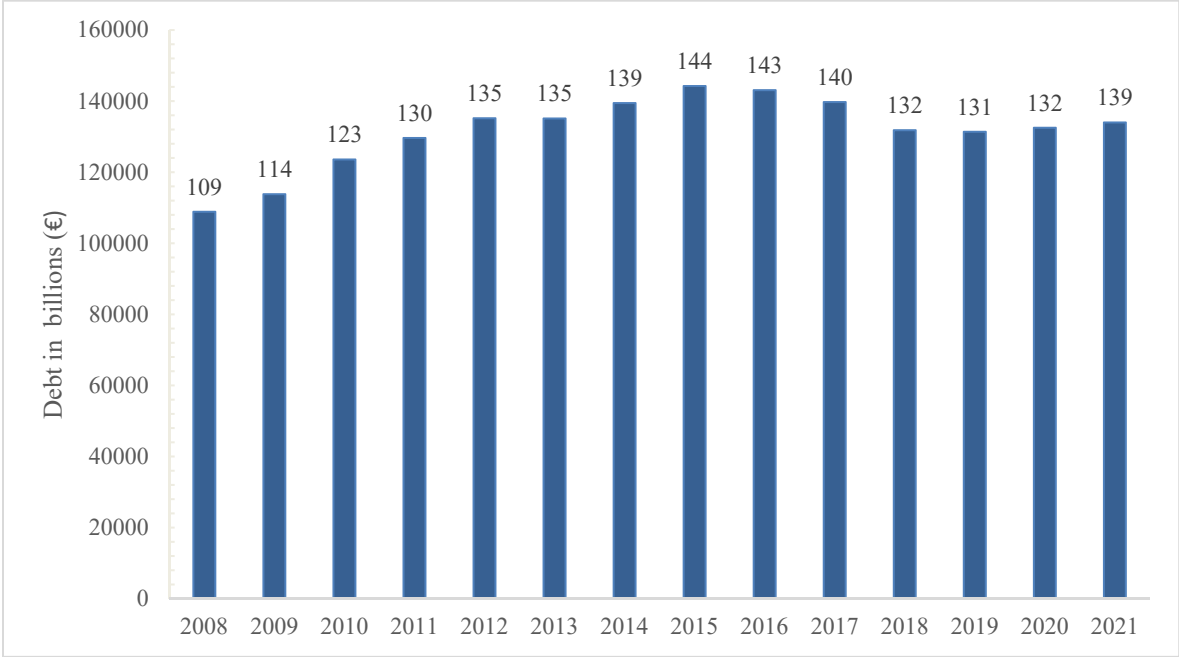
Source: Statistisches Bundesamt 2019a.

The aggregated municipal debt level rose after the financial crisis of 2008/2009, reaching its peak in 2015 with a debt level of 144 billion euros. A visible improvement took place due to the introduction of economic recovery and government support programs in 2016. In the particularly fiscally good years 2017 and 2018, municipal debt was reduced significantly.

This was in large part due to a reduction in short-term lending. Short-term lendings, which are called *Kassenkredite* in German, are a special type of lending instrument which are intended to bridge short-term liquidity problems. Municipalities can obtain this type of loan without approval by the supervisory body at the federal level. Figure 2.14 shows the development of this type of loan between 2008 and 2021.

With regard to overall debt levels, a slight increase can be seen from 2019, continuing until the first quarter of 2021. This is most likely due to the economic regression that happened in the wake of the Covid-19 pandemic.

Figure14 shows the development of the short-term lendings between 2009 and 2021.

Figure 14: Short-term Lendings of Municipalities 2009 - 2021
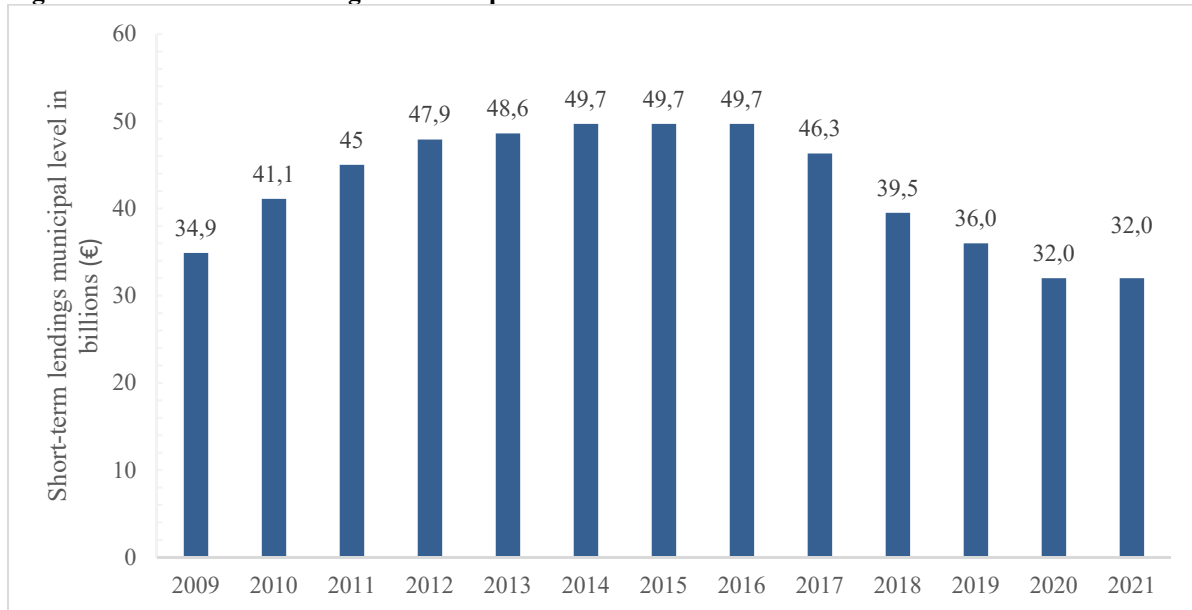
Source: Own depiction. Data from Bundesministerium der Finanzen 2021.

The volume of short-term lendings increased from 35 billion euros to around 50 billion euros in 2016. The increase in short-term lending shows that many municipalities were not even able to cover current expenditure with current revenue. Since 2017, there has been a trend reversal, towards a reduction in the level of short-term lending. However, this effect has to be considered with caution as it is distorted by debt rescheduling programmes of the *Länder*. The most important example is Hesse where in 2018, during the "Hessenkasse", 4.9 billion euros of short-term lendings were transferred to a special fund held by the *Land's* Wirtschafts- und Infrastrukturbank Hessen. The fund is repaid by municipalities and the state of Hesse over 30 years. Ultimately, this measure led to a shift in public debt and not to a real reduction. A similar effect is to be observed in Lower Saxony where, during the "Treaty on the Future" some municipality debts were rescheduled. As such, short-term lendings of the municipalities in Lower Saxony were reduced from 4.8 to 1.9 billion euros between the years 2011 and 2017. Since 2018, the reduction of short-term lendings slowed. In the first quarter of 2021 they stood at a level of 32 million euros.

As mentioned previously, the levels of municipal debt greatly vary between the different German *Länder*. Figure 15 gives an overview of the volume and composition of the municipal total debt in 2018 at *Länder* level and per capita.

Figure 15: Total Municipal Debt by Type and Land in 2018, in Euro per Resident
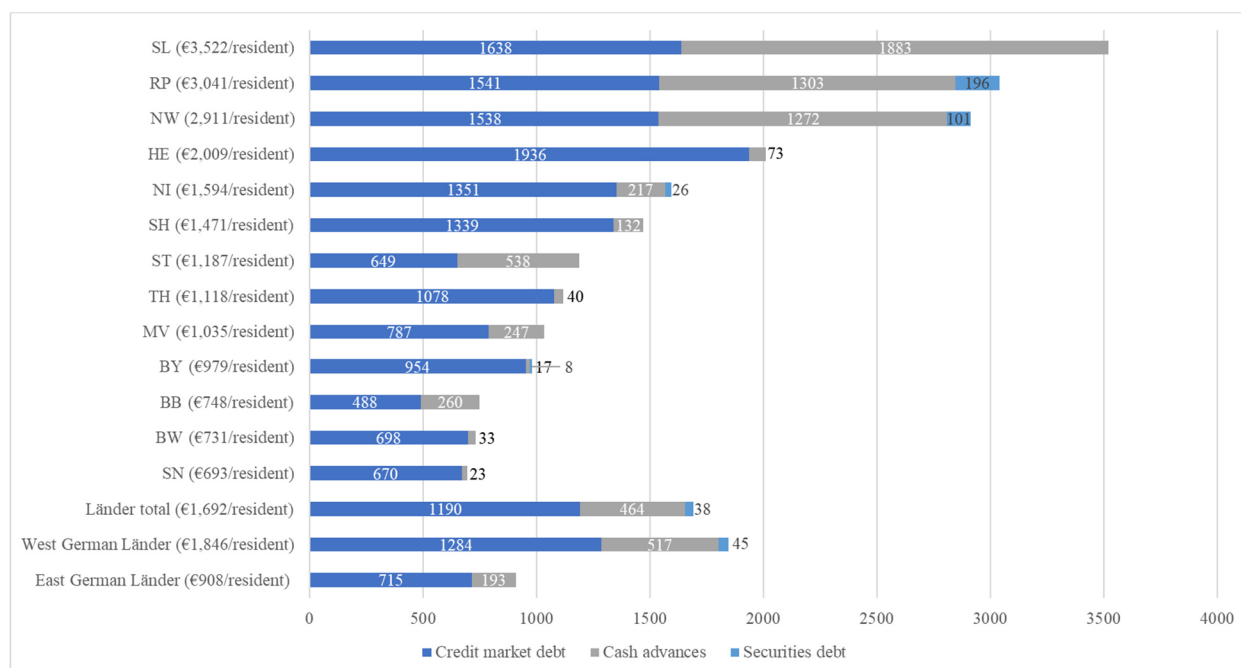
Source: Own calculations based on data from Statistisches Bundesamt (Series 14, Row 5.2).

This comparison reveals large differences in the level and structure of municipal debt. In three *Länder* – Saarland, Rhineland-Palatinate and North Rhine-Westphalia – the debt level is well above the average municipal debt level. The average debt level of these three *Länder*, with 3,158 euros per resident, is almost twice as large as the average municipal debt of all *Länder*. Municipalities in these three *Länder* also have the highest level of short-term lendings. Municipalities in Saarland held four times as many short-term lendings per capita compared to other municipalities. On the other hand, municipalities in Saxony, Baden-Wuerttemberg, Brandenburg and Bavaria had the lowest debt levels, with values far below 1,000 euros per resident. These states held only a very small amount of short-term lendings.

Municipal debt per capita in the *Länder* of Hesse, Lower Saxony and Schleswig-Holstein was also above average. However, the share of short-term lendings within the debt portfolio was at average level.

Figure 16: Financing Balance of the Municipalities and Municipal Associations in Billion Euro
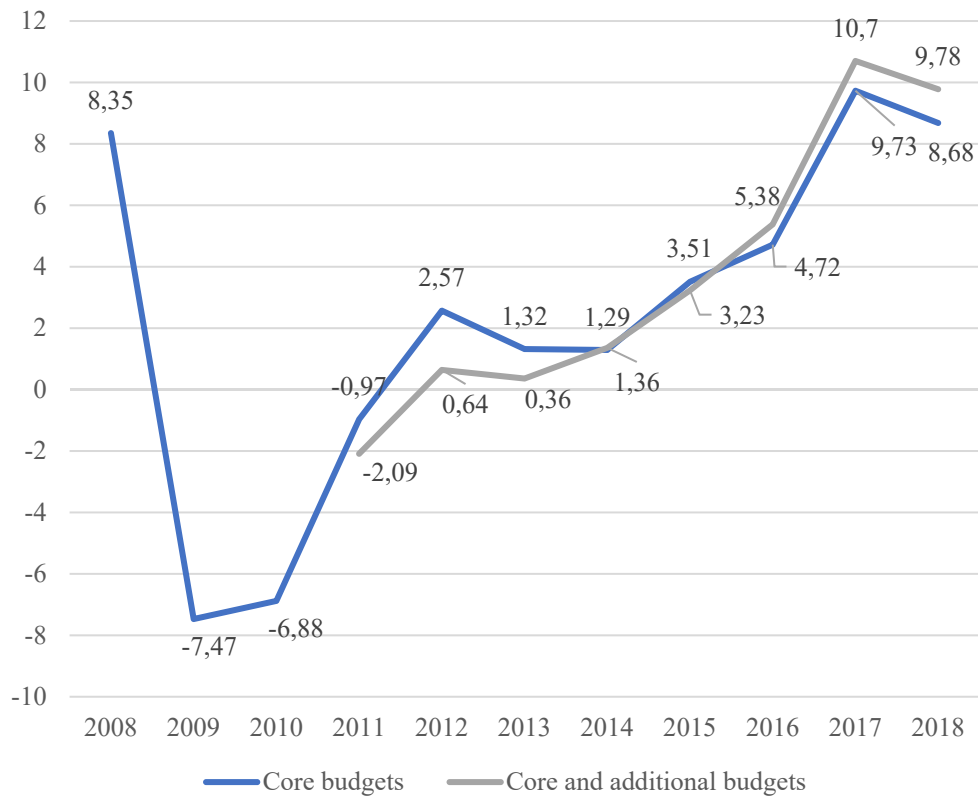
Source: Own figure based on Bertelsmann Stiftung 2019, p. 18; data from the Statistisches Bundesamt (until 2010: Fachserie 14 R. 3.1; from 2011: Fachserie 14 R.).

Figure 16 shows that the fiscal balance of the municipalities as a whole evolved from a surplus of 8.35 billion euros to a deficit of 7.47 and 6.88 in the years 2009 and 2010. Since 2011, municipalities have managed to stabilize their revenues and expenditures and reached moderate surpluses again. This surplus increased to 10.7 billion euros in 2017 and then decreased to a surplus of 9.78 billion euros in 2018.

While in 2018 there was still a financing surplus of 8 billion euros, in the first half of 2019 municipalities showed a financing deficit of 0.3 billion euros in total (Statistisches Bundesamt press release no. 381, 27th of September 2019).

In the next section, the budgetary process in German municipalities is explained.

2.3 The Municipal Budget – Principles and Procedure

Having analysed municipal finances in Germany, this section explains the core subject of this thesis, the municipal budget. Section 2.3.1 outlines those budgetary principles which apply in Germany. Section 2.3.2 explains the different components of the budget and the budget cycle.

2.3.1 Budgetary Principles in Germany

The municipal budget comprises the overall state of public finances within a municipality, including all revenues and expenditures within that year. The municipal budget is established in the form of a budgetary statute which determines the rates of municipal taxes, the maximum amount of short-term lending, and the total quantity of loans that the municipality is permitted to take out. Thus, the budget shows the municipal goals and municipal tasks in figures and defines the activities of a municipality for the coming year.

This budget is the main subject of discussion in local PB programs. The participation of citizens in the budgetary process stresses the political purpose of the municipal budget, which is to express and fulfil the will of citizens. Next to that political function, it fulfils other important functions such as budgetary compensation and the planning of municipal activities. In addition, it may control the activities of the administrations, and also serve an economic and social political function (Zimmermann/ Döring 2019, p. 297 sub seq.).

Many of the budgetary principles were developed with regards to their political function. For example, the principle of publicity ensures that all stages of the budgetary cycle should be open to the public. The budget serves as source of information for the public on all those planned measures which have financial implications (Schwarting 2019).

Another important principle is the principle of prioritisation, which states that the budget plan should be drawn up before the respective budget period. Furthermore, the principle of unity needs to be considered, which stipulates that all revenue and expenditures are displayed in a single budget. Thus, the budget also fulfils a planning function. Budgetary and financial planning differs from other specialized planning in that it covers an entire area very comprehensively and must be updated annually (Schwarting 2019).

Another important function is to ensure that the budget is balanced. The goal of this function is to avoid continuous budget deficits.

A further function of the budget is to manage and control administrative activities. The budget is the basis for action taken by the administration. The adopted budget authorizes the administration to make expenditures or disbursements. Furthermore, the budget and the associated reporting system enable the council and the public to control the activities of the administration, and to study in detail whether and to what extent the administration has complied with the budget plan.

Moreover, the budget can create economic incentives. This function is more important on the federal level where the structure of the budget has effects on economic stabilisation and growth. However, municipal budgets can contribute to regional economic development if priorities are set in such a way as to provide the necessary infrastructure for regional growth (Zimmermann/ Döring 2019, p. 306). These functions and principles are the basis for drawing up the local budget.

2.3.2 Legal Bases, Structure of the Budget and Budget Cycle

The budget is a matter for local self-government. Thus, the local government can prepare and manage the local budget autonomously. The budget as a whole does not need approval by the municipal supervisory authority. It only acts as a legal supervisor, i.e., it examines the budget for legal violations. If it finds such violations, it can object to the budget, demand changes, or impose conditions. However, as mentioned in the previous chapter, local borrowing must be approved by the *Land* (Schwarting 2019).

Local authority budget regulations in each municipality (dt. *GemHVO- Gemeindehaushaltsverordnung*)[6] determine the basics of the municipal budget and it cycle. Other by-laws govern areas such as "cash management", which is regulated by the "Local Authority Cash Management Ordinance" (dt. *Gemeindekassenverordnung*), and the management of municipal enterprises (dt. *Eigenbetriebsverordnung*) (Bundesministerium der Finanzen 2020, p. 59 sub seq.).

The municipal budget is divided into an "administrative budget" and a "capital budget". The capital budget contains the income and expenditure affecting assets (including capital expenditure, borrowing and loan repayments); the other - non-asset-related - cash flows appear in the

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[6] For details, see Baden-Württemberg: § 79 GemO, Bavaria: Art. 63 GO and Art. 57 LKrO, Brandenburg: https://bra-vors.brandenburg.de/verordnungen/komhkv, Hesse: § 94 HGO, Mecklenburg-Vorpommern: https://www.regierung-mv.de/Landesregierung/im/Kommunales/Doppik/, Lower Saxony: § 112 NKomVG, North Rhine-Westfalia: § 78 GO, Rhine-land-Palatinate: § 95 GemO, Saarland: https://recht.saarland.de/bssl/document/jlr-GemHVSL2006V6IVZ, Saxony: § 74 SächsGemO, Saxony-Anhalt: § 100 KVG LSA, Schleswig-Holstein: § 77 GO (Kameralistik) and § 95 GO (Doppik) Thuringia: § 55 ThürKO (Kameralistik) und § 6 ThürKDG (Doppik)

administrative budget. As a rule, any surplus revenue from the administrative budget is transferred to the capital budget, where it is used to finance investments (Bundesministerium der Finanzen 2020, p.58 sub seq.).

The municipal budget is divided into individual plans, sections, and subsections according to the area of responsibility. Revenues and expenditures are classified in the task areas according to their types. This classification and grouping is based on the classification and grouping plan annexed to the GemHVO, which is binding for the municipalities (Bundesministerium der Finanzen 2020, p. 58 sub seq.)

The financial statements must be prepared on the basis of commercial double-entry bookkeeping. Most municipalities had to change their accounting system from "cash-based accounting" to "accrual-based accounting" systems as part of a wave of administrative modernization during the 1990s, known as the "Blueprint for reforming local authority budget legislation". The reforms aimed to apply business principles to the municipal administration with the goal to create more efficiency and to be more customer-friendly (Bundesministerium der Finanzen 2020, p.58 sub seq.) The focus of the accounting system is no longer on the tasks of the municipality; instead the budget is structured according to the services and products provided. As a measure to achieve these goals, product budgets were introduced in many municipalities. Besides financial information (expenses and revenues), the product budget contains information about the municipal services and products (Bundesministerium der Finanzen 2020, p. 58 sub seq.).

Budget structure and budget cycle

Integral parts of the budget are the preliminary report for the budget, the budget statute, the budget plan, the personnel budget plan, and the reports and business plans of the municipal enterprises and special assets. The double-entry budget also includes a balance sheet, while the cameralistic (single-entry) budget includes a statement of assets and liabilities.

The most important part is the budget statute, which is the legal basis that must be adopted by the municipal council so that the budget can be implemented by the administration. It specifies, among other things, the budget volume, the planned borrowing, the maximum amount of short-term lending, the rates of assessment for the property and trade taxes and, in the case of municipal associations, the assessment rates for the municipal association levy.

These parts of the budget are developed during the budget cycle. During this cycle, the budget goes through various stages, starting with planning and ending with the final discharge. In total, the duration of this period is about 2 1/2 years. The first phase of the budget cycle is the preparation of the draft for the budget plan and statute by the administration.

In the second phase, the draft budget is discussed within the municipal council. The budget draft is made publicly available at the municipal office two weeks before the municipal council decides whether to accept the budget draft. During this phase, citizens are allowed to raise a plea in written form. These pleas are then discussed by the expert and finance committee and are included in the draft budget statute if they are seen as relevant and rational. Otherwise, direct participation in the budgetary process like petitions or referenda are not forseen and in most *Länder* even forbidden by law. During the second phase of the cycle, the budget must be presented to the budget supervisory agency.

In the third phase of the budget cycle, the budget plan and budget statute are approved and become legally binding. In the fourth phase, the budget is executed. During the fifth phase, the financial statements for the budget execution are prepared by the municipal treasurer. This is followed by the sixth and final phase of the budget cycle, which is the audit of the financial statements by the audit office (Schwarting 2019, Zimmermann/Döring 2019).

2.4 Chapter Summary

In this chapter, the role of municipalities in the federal system of Germany was explained. Municipal tasks and the sources of municipal revenues were described, as were the means by which municipalities can borrow. Furthermore, the traditional budgeting process in Germany was presented. Thus, the institutional and financial background for the introduction of a PB process in Germany has been laid down.

This chapter has shown that the German *Grundgesetz* grants substantial self-administration rights to the municipalities. Thus, they fulfil many public tasks autonomously. However, there are no laws securing or defining the scope of their public tasks. Many of the duties are assigned to the local level from higher government levels. Accordingly, the range of tasks greatly varies between the German *Länder*. Germany's cooperative federalism consists of three government levels: the federal level, the *Länder* level, and the municipalities, which are legally part of the *Länder*. While the German cooperative federalism was designed with the intention to promote strong *Länder* governments, over time, more and more legal competencies were transferred to the federal level. The latest reforms, that entered into force in 2020, strengthened the federal level once again.

Municipal tasks can be categorised into tasks that municipalities may decide about autonomously and those that are transferred to them from higher government levels. The tasks that

municipalities can decide about totally independently generally comprise those tasks in the areas of culture, leisure, and business development.

The data on local public expenditure show large differences in expenditure per resident in the *Länder*. Differences are especially large when it comes to spending for social services. There are some *Länder*, most notably North Rhine-Westphalia, in which municipalities face extremely high expenditure for social services. This is an expenditure item which can hardly be influenced by the municipality. On the other hand, the data show that expenditure for investments only takes up a small part of all expenditure. Municipalities in Southern German *Länder* are able to spend significantly more money on local investments than municipalities in other *Länder*. In municipalities that do not spend enough on investments, local infrastructure and quality of livewill deteriorate. This can lead to long-term structural problems, and will increase the disparities between municipalities in different *Länder*. These structural differences in municipal tasks and expenditure might also lead to different behaviour when it comes to adoption of PB. Therefore, in Chapter 4 these structural differences will be discussed in more detail in the course of theoretical analysis around the adoption of PB.

In order that the municipality be able to fulfil its comprehensive tasks, it must raise considerable financial resources. Local authorities in Germany receive revenues from taxes, special charges, fiscal grants, and financial income. The most important source of municipal revenues is taxes, followed by fiscal grants – whereby the income from fiscal grants for special purposes is higher than from general fiscal grants.

Income from special charges accounts for only 10 percent and financial income for 6 percent of the total municipal income.

The latter two types of income grant the highest level of autonomy to the local authorities. However, this type of income does not make up a significant part of overall municipal income. Considering the income from taxes, which is the most important source of revenue, the level of autonomy depends on whether the tax stems from a system of separated or shared apportionment. Taxes from a system of separated apportionment grant more fiscal autonomy to the municipalities. A large part of their tax income come from taxes for which municipalities have the opportunity to influence the tax collection rate and tax base.

General fiscal grants allow the municipalities some autonomy as to how they use these grants. However, municipalities still have only very limited influence on the quantity of grants they receive. Fiscal grants that are linked to specific purposes offer the smallest degrees of autonomy to municipalities.

In order to fulfil their right to self-administration, municipalities have to be granted financial autonomy. However, looking at the current data considering different sources of revenue, it must be concluded that municipalities depend to a large part on income coming from sources that they can barely influence.

Borrowing is another possible source of income for German municipalities. However, excessive borrowing can lead to major interventions in local self-government and politics. More especially, the scope to offer voluntary tasks that can be decided on autonomously shrinks as levels of debt increase.

As laid out in this chapter, the budgetary process is a highly technical and quite complex issue, and federal state legalisation is not homogeneous. Depending on the size of a municipality, the budget can contain between several hundred pages to several thousand pages. In order to be able to extract and interpret information, a sound knowledge of budgetary systematics, budgetary law and budgetary policy is necessary. As not even all members of the representative body have this knowledge, citizens are unlikely be able to understand the local budget. Here, PB programs can contribute to improving transparency.

This review of the role of municipalities in the federal system of Germany shows that the local council can in fact only decide on a small share of the budget, since a large share is pre-set by obligatory tasks, that municipalities have to fulfil and that are decided by higher government tiers. Furthermore, direct influence from citizens in budgetary matters is actually prohibited by law in many *Länder*. These circumstances must be considered when analysing the diffusion of PB programs in Germany.

3. Participatory Budgeting – Origins, Diffusion and Research Findings

This chapter describes the concept of PB. The origins of PB and its global diffusion are illustrated in section 3.1. Section 3.2. explains when and under which circumstances PB was introduced in Germany. Section 3.3 provides a literature review that summarizes, which factors have been identified to influence the adoption of PB processes, which effects of these processes have been found so far and which critical views exist with regard to PB processes. The chapter is closed with a summary in 3.4

3.1 Definition, Origins and Global diffusion of PB
3.1.1 Definition

There is neither a generally accepted definition of the term "Participatory Budgeting" nor a standardized procedure. There are different views on "what PB is and what it is supposed to do" and whether or not a specific process of involving citizens in the budgeting process "is or isn't really" a case of PB (Wampler 2012, p. 3). As PB travelled the globe, process design and objectives changed. While the goal to create more social justice was central in the first PB experiences in the early 1990ies, PB processes in Europe were adopted within the framework of broader reform efforts in the area of public management. These experiences are mostly only consultative while the outcome of i.e. PB in Brazil are politically binding. Therefore, different local interpretations of what PB can be exist (Wampler/ Hartzkarp 2012, p.3). In Germany, municipalities implement very different procedures compared to the original models, adapted to the respective political and economic circumstances. The decisive factor for the introduction of PB in German municipalities and cities was the trend towards more participation at the local level, which took place in the 1990s (Sintomer et al. 2010, p.113 sub seq., Bogumil et al. 2007, p. 45 sub seq.).

Nevertheless, most PB processes follow the same basic idea, namely the participation of citizens in drawing up the budget as part of a municipality's budget cycle. Thus, PB can be described as "a one-year decision-making process in which citizens negotiate among themselves and with government officials in organized meetings over the allocation of public revenues and expenditures" (Wampler 2007, p. 21). PB can therefore be a tool that redistributes decision-making power from elected officials to citizens. How many competencies are transferred to the citizens depends on the rules of the PB, which vary from country to country. While in some countries PB is an instrument of direct democracy on the representative side, in other countries

it is merely a tool for informing citizens about municipal finances. There is no precise or exact model for PB programs. Most PB processes have certain similar characteristics but the specific process and institutional design are adjusted to the particular political, social, and economic environment of the adopting municipality. There is no binding definition of what qualifies as a PB program. The range goes from a not binding collection of proposals for smaller projects over consultation to binding participation of citizens in financial matters of a municipality (Baiocchi 2015).

A widely used definition of the term "Participatory Budgeting" based on a worldwide comparative study of PB programs names five criteria that should be met to speak of a PB program and to distance this tool from other participative tools. The first criterion that has to be met in order to speak about PB is that the financial and/or budgetary dimension must be the central subject that is discussed in the process. The second criterion is that an elected body with some power over administration has to be involved, which means it is not sufficient for just a neighbourhood level that does not have any administrative power to be involved. The third criterion is that the discussion about the municipalities' finances has to be a repeated process; a one-time referendum on financial issues is not considered to be PB. Moreover, the process has to involve public deliberation that is embedded within specific forums that were established for carrying out the PB process. It is not sufficient for already existing administrative meetings to be opened up to the public. The last criterion is that participants have to receive feedback on the output of the PB (Sintomer et al. 2010, 2012).

In the next section, the origins and diffusion of PB worldwide will be portrayed.

3.1.2 Origins and Global Diffusion

The idea of PB was born in Porto Alegre in Brazil during Brazil´s transition from military dictatorship to democracy in 1989. The key factor in its development was a "window of opportunity" which opened in the aftermath of the electoral victory of the Worker´s party (Partido dos Trabalhadores) (Abers 2000). The Worker´s party is a "pluralist left-wing party" which was founded during the trade union movement in the 1970s. Middle-class intellectuals, supporters of liberation theology, members of former left-wing parties and extreme left groups as well as social movements in the cities and in the country joined it (Herzberg et al. 2008). The Worker´s party actively promoted transparency in government affairs and more citizen participation in the policy-making process (Wampler 2007).

However, PB did not evolve from a top-down process. During Brazil's military dictatorship, a politically aware civil society grew. Having experienced years of suppression and growing social injustice, citizens demanded more participation rights and more transparency in public finances. PB evolved from a mutual dialogue between policy-makers and citizens. Public programs and projects were discussed in public meetings. In these meetings, priorities were defined and citizens appointed delegates who were to supervise whether these priorities were implemented in the further course of the budgetary process. This process led to what was later called Participatory Budgeting (Sintomer et al. 2008, p. 166 et seq.).

One of the main goals of PB in Porto Alegre was to reach a higher level of social justice. To make sure that this goal was accomplished, a distribution key was established that ensured that districts with higher poverty rates, larger populations and poorer infrastructure received more resources than wealthy neighbourhoods (Sintomer et al. 2010, p. 31 sub seq.).

The rules for PB are made by the elected government with contribution from citizens. The defined rules and any changes that occur later have to be approved by the citizens (Wampler 2007). To legally ensure the participation of citizens in the budgetary process, it was laid down in the constitution of Porto Alegre in 1990 that citizens have to be involved in the budgetary process (Herzberg 2001, p. 43).

Since PB was very successful in Porto Alegre, more and more cities in Brazil adopted the process. More than 200 PB processes were counted in 2010 (Sintomer et al. 2008, p. 166 et seq.). In larger cities, the distribution of PB was even more impressive. Between 2001 and 2004, PB quickly diffused in Brazil. By 2004, 58 percent of the Brazilian population lived in a city with a PB process (Marquetti 2005).

Around the year 2000, the concept of PB started to extend beyond Brazil to many followers in other Latin American countries and became the most popular instrument of citizen engagement in Latin America with around 1000 municipalities adopting PB processes. Geographical distribution covered almost all regions of South America and, to a lesser extent, Central America (ENGAGEMENT GLOBAL gGmbH 2014, p.35).

According to Transparency International's corruption index, PB programs spread mainly in Latin American countries where the corruption index is particularly high (Transparency International 2011). Empirical studies show that PB processes have indeed positive effects in reducing corruption (Zamboni 2007). Besides the reduction of corruption and better accountability of elected officials, quantitative studies also find that other goals of PB like the creation of more social justice in allocating resources are fulfilled in the Brazilian examples.

Various qualitative field studies have confirmed as well that PB is a powerful instrument of redistribution in favour of the poor. In the slums of Porto Alegre and other cities, this has resulted in improvements in many areas: housing, asphalting, sanitation, land use planning and education. A detailed presentation of the literature concerning the impacts of PB will be given in section 3.4.

Due to its positive effects in Brazil, the idea of PB travelled around the world. The number of cases noted globally increased rapidly. As only a handful of PB programs worldwide was counted in 1999, in 2019, around 12,000 PB cases in 71 countries could be identified[7] (ENGAGEMENT GLOBAL gGmbH 2014, Dias et al 2019). In the last years, the number of PB processes in South America has been reducing. An increase of the number of PB cases was registered in Peru, where a law was enacted in 2009 that made it compulsory for all municipal and regional governments to adopt PB. For this reason, the country concentrates about 68 percent of the continent's PB cases. Also, in Ecuador a law was passed in 2010, which makes implementation of the PB compulsory for the 221 municipalities and 24 regions (Dias et al 2019).

Figure17 shows the number of PB processes worldwide by country (date 2019).

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[7] These figures should be handled cautiously since they do not cover all procedures.

Figure 17: Number of PB Processes worldwide
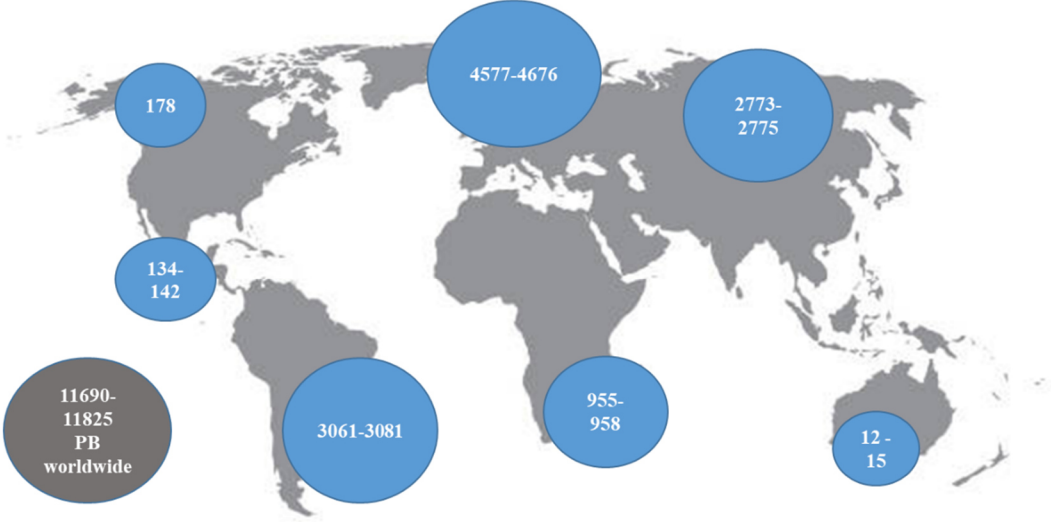
Source: Own figure based on Dias et al. 2019, p. 16.

The data show that, in the last decade, Europe has overtaken South America as the region with the largest occurrence of PB, with around 4,600 cases representing approximately 39 percent of all PB cases documented worldwide.

PB spread very quickly in Europe in the early 2000´s, mainly due to the World Social Forums in Porto Alegre. By 2005 there were already 55 PB programs implemented in Europe. By 2009, 200 PB processes were counted, largely due to the rise in the number of PB processes operating in Italy, Spain, and Portugal. Many municipalities in these countries joined networks, for example within the framework of support programmes such as URB-AL, in order to establish relations with towns and municipalities in Latin America (Cabannes 2003). The goal of the URB-AL program was to further partnerships between towns, regions and other local and regional authorities in the European Community and Latin America. In the course of the program, eight thematic networks of mutual interest were found which resulted in different joint projects co-financed by the European Commission (URB-AL 1998).

In 2003, the first PB processes were adopted in Eastern Europe; Poland in particular started many PB processes. In Northern Europe, the first PB programs were introduced in Norway and Sweden in 2008, in Iceland in 2010 and in Finland in 2012 (ENGAGEMENT GLOBAL gGmbH 2014, p. 59 sub seq.).

However, in Europe PB did not become an integral part of local politics. In 2009, the majority of the PB programs were closed in Italy. This is due to the abolishment of the municipal property tax on self-occupied residential property introduced by the Berlusconi government. After the local elections in Spain in 2011, 85 percent of Spanish municipalities underwent a change of power and the new local governments did not want to continue the flagship projects of previous governments. As a consequence, many PB processes were abandoned. Nevertheless, the number of PB programs in Europe, especially in Portugal, Germany, the UK and Poland, increased. In the UK, PB programs were implemented with the goal to strengthen the position of local communities, and were officially supported by the government in London (Herzberg 2008, p. 224 sub seq./ ENGAGEMENT GLOBAL gGmbH 2014, p. 49).

An increase of PB processes could be noted in particular due to the PB law that was passed in Poland in 2009 and applies 2,173 rural municipalities. It aims to further direct democracy at the local level through "Solecki funds2. The national law does not impose any binding obligations but does provide financial incentives. Since 2009, there have been more than 20,000 citizens' meetings in small towns and villages, and 375 million zlotys (82 million euros) have been allocated for this form of citizen participation (Herzberg et al. 2014, pp. 52-53). As a result, 46 percent of European PB processes are now located in Eastern Europe; meanwhile around 46 percent of PB processes can be found in Southern Europe. Only 5 percent of PB processes are carried out in Western Europe and only 2 to 3 percent in Northern Europe (Dias et al. 2019, p. 32).

In North America, the concept of PB arrived much later, with the first initiatives dating from 2009. PB processes there rely heavily on concepts linked to the tradition of community development, such as the promotion of disadvantaged neighbourhoods by self-organised interest groups (Lerner/Wagner 2006). In 2019, 178 PB cases were counted in the US and Canada which accounts for approx. 1.5 percent of the total number of PB in the world (Dias et al. 2019, p. 35).

In Africa, development organizations and international organizations were important for the initial adoption and diffusion of PB processes, which is now also being taken into account by UCLGA, the African umbrella organization of cities and municipalities. Some bottom-up cases developed, based on exchange with European and Latin American initiatives. This has contributed to the spread of some successful examples of PB. In 2012, there were between 77 and 103 examples, mainly in Senegal, Cameroon, the Democratic Republic of Congo and Madagascar. By 2019, between 955 and 958 PB processes were identified in Africa, which represents about 8 percent of the total number of cases worldwide. In domestic terms, the sub-region of Central

Africa stands out, with around 40 percent of all PB processes in Africa located in that region (Dias et al. 2019, p. 34).

In Asia, the adoption of the first PB processes was in 2005. The first Asian PB process was adopted in Kerala, India, after local government learned about it from European and Latin American scientists and activists. After an exchange with Brazilian delegates, further PB processes were adopted in Indonesia, South Korea and China (ENGAGEMENT GLOBAL gGmbH 2014, p. 57 sub seq.).

In 2019, between 2,773 and 2,775 PB initiatives were identified in Asia, which represents about 23 percent of the total number of PB processes worldwide. At the regional level, the East Asian sub-region sticks out, with around 77 percent of all PB identified in that region. These results must be treated with some caution because, on the one hand, they do not take account the initiatives known to exist in Thailand, Bangladesh and Sri Lanka and, on the other, they are strongly influenced by Japan's figures. Japan´s large number of PB processes (1,865), is mostly due to the "hometown tax". That is a law enabling municipalities to give citizens the opportunity to pay local taxes to municipalities where they do not live but that they want to support. 1,788 municipalities have made use of the law and 1,708 of these municipalities allow the taxpayer to choose how the government of the territory should spend that money (Dias et al. 2019, p. 38). Thus they are not explicitly a PB process, although they function like one.

Indonesia was the first Asian country to create legislation to make PB mandatory for municipalities. Due to that law, 74,000 villages in the country are expected to adopt PB. That would lead to an enormous increase in the number of PB processes in the country and in the world. South Korea was the second state in the region to make PB in its 243 municipalities obligatory by law. In Oceania, only between 12 to 15 examples of PB processes have been identified in 2019. The first documented appearance of PB is the case of Christchurch in New Zealand during the 1990s. This example became especially important for the design of German PB processes, which will be further described in section 3.2. In 2019, among the 14 countries and 9 dependencies that make up Oceania, all identified PB cases were located in Australia. The emergence of PB practice there started rather later with the first documented process taking place in Canada Bay in 2012. Australian PB practices are very similar to those conducted in other Western democracies (Dias et al. 2019, p.191).

To sum up, an overall increase of PB processes globally can be observed, albeit with large differences visible when considering the diffusion by regions. As the originating country Brazil has abandoned such processes, Europe has instead become the region with the largest number of documented PB processes. However, 74 percent of the processes are concentrated in only

two countries, Poland and Portugal, which have passed laws to make the adoption of PB mandatory (Dias et al. 2019, p.50).

In other areas of the world, the increase of PB processes is mainly due to the adoption of PB based on national laws. In Central America and the Caribbean, almost all noted PB cases are the result of legal imposition. In Asia just two countries, Indonesia and South Korea, both of which have national legislation on PB, account for around 27 percent of all identified PB cases in the region (Dias et al. 2019, p. 50).

When looking at the diffusion of PB processes, a surprising observation is that around 85 percent PB cases are based in 31 countries with "imperfect democracies"[8]. 5 percent of PB processes are found in countries with authoritarian regimes. 4 to 5 percent of PB cases are located in states with full democracies. Another 4 to 5 percent of identified PB cases are witnessed in countries with so-called "hybrid regimes". Accordingly, there are more PB cases in countries where political, civil and other freedoms do not exist or are limited compared to countries that qualify as "full democracies" (Dias et al. 2019, p. 41). The most PB cases found in countries characterized as "full democracies" are in Spain with around 400 cases and in Germany with 102 cases in 2019.

To sum up, PB has become a global phenomenon, but its distribution, form and the motivations for its adoption vary greatly from country to country. All these individual PB experiences can be categorized in different ideal types of PB; these will be presented in the following section.

3.1.3 Typology of PB processes

The phenomenon of PB has spread globally, but to varying extents and with different diffusion patterns. The design and implementation of PB programs around the world differs in many ways. Original PB processes in Brazil were mostly initiated bottom up and were supposed to lead to an empowerment of economically disadvantaged social classes. In Europe, most of the programs were started top-down and in combination with a modernization of the administrative apparatus. As PB programs in Brazil and Latin America were intended as a tool for the poorer classes, the participants largely were themselves poor. Initially, parties of the socio-democratic and post-communist left took part in this dissemination across Western Europe. However conservative governments were also active in this process. PB has been a bipartisan phenomenon right from the start in Sweden, Germany, Portugal and Poland (Sintomer et al. 2010, p. 53).

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[8] According to the democracy index applied by Dias et al 2019; see p. 14 for a detailed description of the applied criteria.

The term PB now covers different kinds of processes in terms of context, goals and scope. Based on the differences between these features, different types of PB can be defined. Based on comparative studies of PB processes around the globe, Sintomer et al. (2012, p. 19 sub seq.) propose a typology of six ideal types. They call these ideal types:

1) "Participatory democracy
2) Proximity democracy
3) Participatory Modernization
4) Multi Stakeholder participation
5) Neocorporatism
6) Community development."

In reality, these ideal types are often blended, though forms of these ideal types occur. They can be used as a roadmap on which individual PB programs can be mapped.

The first ideal type, *participatory democracy,* is the one closest to the example of Porto Alegre. PB processes that fall in this category are frequently adopted due to a change in the existing political system, as in Porto Alegre. This type of PB is usually furtherer by leftist parties while the political orientation of the local government does not influence the adoption of PB in the other ideal types. Important goals associated with this form of PB include social justice and the reallocation of resources. PB processes in this category are characterised by the empowerment of citizens and by a high quality of deliberation. This type of PB process is not linked to further reforms of the administrative apparatus. Latin American PB processes are prominent examples for that type of PB. Moroever, the city of Seville (Spain) and the city of Dong-ku (South Korea), also exhibit some of the same criteria.

In the model of *proximity democracy*, PB processes develop out of an effort to bring the administration closer to the citizens. The processes can be described as "selective listening" as citizens are consulted in citizen forums and in deliberation on budgetary matters, but in the end elected officials choose the proposals that are most in line with their own ideas and which can therefore be integrated into the budget most easily. Rules of the process are rather informal and decision-making authority remains with the traditional institutions. Empowerment of the citizens does not happen. PB processes that comply with that type have been most common in Europe and are often implemented by neighbourhood councils and neighbourhood funds. PB processes of that type can also be found in North America, Australia, Korea and Japan (Sintomer et al 2012, p. 21).

The model of *participatory modernization* is also described as a model that focuses on *consultation on public finances* (Sintomer et al. 2010, p. 259). PB processes that follow such a model are a part of general efforts to further reforms in the administrative apparatus. The goal is to make municipal finances more transparent and to make public services more efficient by utilizing input provided by the citizens. Thus, the integration of disadvantaged population groups or initiation of specific social policy as in the original PB processes are not part of the goal set of this PB process. PB processes in this category are purely consultative and characterized by a low deliberative quality. Examples of this type of PB can be found in Germany as well as in China (ENGAGEMENT GLOBAL gGmbH 2014, p. 20).

The ideal type *multi-Stakeholder participation* is, as the name already indicates, characterized by the inclusion of many different stakeholders in the process. Thus, next to the citizens, elected officials and members of the administration, as well as private companies and NGOs, are included in PB processes. PB processes of this model do not enable an empowerment of the citizenry. Most processes that fall into this category of PB process can be found in Eastern Europe. A prominent example is the Polish city of Plock, where a public-private partnership between the city, the company PKN Orlen (Poland's largest oil company, based in Płock), the company Levi Strauss and the representatives of some local NGOs has been established (Sintomer et al. 2010). Some African PB processes fit this model to some extent, especially when they are used in the context of decentralization processes and financed by external actors.

In *neo-corporatist models* the involvement of organized interests in politics and their participation in the formulation and execution of political decisions is important. The goal is to bring together organized groups (like NGOs, trade unions etc.), social groups (elderly people, people with a migration background etc.) and other institutions to create a social consensus in which interests, values and the desire for recognition of different parts of society are balanced. In PB processes of this type, the political orientation of the executive branch is of little importance. Moreover, they do not go hand in hand with attempts to modernize administration. There are not many PB processes that fully belong to this category, though some processes in Spain come close (Sintomer et al. 2012, p. 24).

PB processes that follow the *Community development* model are mostly local activities that are detached from local politics. The initiators of these proceedings are often district-based initiatives and associations. The rules of these process are usually clearly defined, and the deliberation is of relatively high quality. PB processes that are based on this model are particularly widespread in the Anglo-Saxon world, such as those in Canada (with the Toronto Housing

Community or the Guelph participatory budget) and in Great Britain (the Tower Hamlets participation process in London) (ENGAGEMENT GLOBAL gGmbH 2014, p. 40).

Ideal types show differences in the implementation of PB programs across the world. One important distinguishing feature is the extent to which decision-making authority is transferred to the level of the civilian population. In the first type, citizens are provided with de facto decision-making competence and they are involved in shaping the procedure. The second and third types of PB are consultative procedures in which no competences are transferred to the citizens. Citizens are not involved in the design of the procedure. Even in the fourth and fifth types, citizens are given little say in the design of the procedures, but decision-making powers are delegated (Sintomer et al. 2008, p. 164 sub seq.).

According to the scope, the quality of deliberations differs as well. In ideal types like the first and sixth model, a high deliberation quality is achieved because public meetings are organized during which citizens discuss issues both among themselves and with elected officials. In PB processes of other types such as consultation on public finances, the quality of deliberation is rather low as in many cases the whole process has become fully digital and participants can only rate proposals on an internet platform. Another distinguishing feature is the topic which is under discussion during PB. During some PB processes, such as the ones that fall in the category of the first model, concrete projects and investments are discussed. In PB processes that can be categorized as ideal type 3, the entire municipal budget is at the heart of the PB process.

The formulation of ideal types makes it possible to compare PB types internationally and to explore their different goals and process design.

The next sections describe which national developments led to the prevalence of the participatory modernization type of PB process in Germany, and how this type of PB is organized.

3.2 PB in Germany

This section focuses on the development of PB in Germany. Section 3.2.1 describes the circumstances under which the first PB processes were introduced in Germany. Section 3.2.2 gives an overview of the diffusion of PB process in Germany. 3.2.3 explains a special type of PB process that has developed in Germany, namely the savings budget.

3.2.1 The Background of PB in Germany

In Germany, the first PB process was implemented during extensive reforms of the local administrative apparatus in the 1990s. The decisive factor leading to the first adoption of PB in German municipalities and cities was the trend towards more participation at the local level which took place in that decade (Sintomer et al. 2010, p.113 sub seq., Bogumil et al. 2007, p. 45 sub seq.).

This development can be situated in a global trend towards the ideas of New Public Management. This trend started in the Anglo-Saxon countries during the 1980s and from there it spread to many other countries. Fiscal crisis was in many countries the reason to start a debate about profound public management reforms (Pollitt/ Bouckaert 2017, p.35 sub seq.) The central idea of the New Public Management approach is to increase efficiency by making administration more business-like (Pollitt/ Bouckaert 2017, p.). Therefore, reform policies under New Public Management put an emphasis on performance, introducing tools to measure administrative output. This approach also involved the creation of small specialised organisational forms in administration, the introduction of competitive tendering and performance related pay, and a general policy of treating service users as customers (Pollitt/ Bouckaert 2017, p.10).

Against this backdrop, the *Kommunale Gemeinschaftsstelle (KGSt)* presented the *Neue Steuerungsmodell (NSM)* as a reformed model for German municipal administration in 1993. The reform efforts also involved initiatives for more citizen participation, due to the new status of citizens as customer users in the New Public Management approach. In addition, it was intended that their participation would contribute to a more efficient provision of public services. As a result, citizens' petitions and referendums were introduced in all municipalities (Bogumil/ Holtkamp 2013, Bogumil 2017). Furthermore, direct election of the mayor was introduced in all *Länder*. As part of these reforms, citizens' information rights have been strengthened as well. This included the provision of the right to file inspection. In addition, the protocols of meetings of the Council and its committees were made public (Herzberg 2008, p.118).

The model of the *Bürgerkommune* emerged to complement the reforms brought about by the NSM. This concept complements the output-oriented, economic reforms of the NSM with input-oriented instruments of cooperative democracy and pursues the goal of bringing about a comprehensive change in the way stakeholders interact at the local level (Bogumil et al. 2007). The *Bürgerkommune* model includes the implementation of consultative participatory procedures such as round tables, civic forums, mediation procedures and planning cells. The adoption of PB processes also falls within these reform efforts (Herzberg 2008, p. 81).

However, PB processes were always an addition to the representative democratic institutions in place and not an instrument of direct democracy. The decision-making power in regard to the municipal budget lies with the elected representatives of a municipality (see chapter 2.3 above). This holds for PB processes as well as for other forms of direct democratic decision-making. These tools serve predominantly as means to enhance the functioning of representative institutions via the creation of stronger links between elected politicians and the citizenry (Banner, 1999, p.145). The political culture still follows the principles of a representative democracy, so it can be concluded that no profound institutional modification occurred. Furthermore, in Germany direct democratic instruments are not as far-reaching as in other countries such as Switzerland, where citizens can vote directly on public expenditure and taxation issues at the municipal and/or state level (Feld/ Kirchgässner 2004, Feld/ Kirchgässner 2005, Feld/ Kirchgässner 2007, Kirchgässner 2013). In all German municipal constitutions, the budget as a whole is exempted from being a subject of direct participatory actions. Furthermore, municipal councils effectively decide only on a small proportion of the budget, since a large share is determined by mandatory municipal tasks that are assigned to the local level by the federal or *Länder* level (see chapter 2). Thus, participation by citizens is in most cases designed as being merely consultative. It is not intended to change the balance of power between elected representatives and citizens.[9]

Moreover, citizens have no part in deciding the rules and framework of PB, unlike citizens in Porto Alegre. That said, due to Article 28 section 2 of the GG on the municipal right for self-administration, every municipality has the right to decide autonomously to introduce a PB process.

To make the implementation of a PB program obligatory, a change of municipal constitution would be necessary (Günther 2007, p.123).

Therefore, Germany can be assigned to the ideal type of *participatory modernisation*. The main purpose of German participatory budgets is to inform citizens about the financial situation of municipalities. The process is purely consultative as ultimately no decision-making authority is transferred to citizens (Herzberg/ Cuny 2007, p. 15 sub seq.). PB processes in Germany have been designed is in line with this goals. The process design was inspired by the city of Christchurch, the second largest city of New Zealand (332,000 inhab.). In 1993, it was rewarded as part of the Cities of Tomorrow network for its citizen-friendly modernization (Cabannes/ Lipietz 2018, p. 74, Günther 2007, p. 52). Since then it has been an important best practise

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[9] Parts of the text in this section have been published in earlier versions: Apostolou (2014) & Apostolou / Eckardt (2022). The data come from the dataset compiled fo the analyses in this dissertation.

example for many municipal reforms in Germany. Municipalities in Christchurch are characterised by a relatively high degree of autonomy, with two thirds of their income generated by the municipalities themselves (Sintomer et al. 2010, p. 74). The participation of citizens in budgetary matters has become a fixed part of the budget planning process. The Local Government Act of 2002 obliges the municipalities to prepare a long-term council community plan for the duration of 10 years and to involve citizens in its preparation. Within this plan, activities and services provided by the council must be defined, as well as how the living condition will develop over the next 10 years (Günther, 2007, p. 52 sub seq.). Furthermore, the council must present an annual report which shows whether the respective goals were reached with the available financial resources. Citizens participate through meetings on the level of the entire local authority, through events in districts, and through the internet (Günther 2007 p.55, Märker 2013). The budget is constituted by a bottom-up principle. Citizens' so-called "community boards" develop project proposals and provide information on public services. From this, the administration prepares a first draft of the budget. This is then revised by the local council. The resulting version of the draft budget will then be presented to the public. As a result, citizens once again have the opportunity to make suggestions. The administration examines the extent to which proposals can be implemented and thus integrates them into the draft budget. At a public meeting, citizens then have the opportunity to personally present and justify their concerns again.

At the same time, citizens receive feedback on the feasibility of financing their proposals both financially and technically. However, the final decision is made by the local council. A transmission of decision-making authority to the citizens does not take place. The results of consultations are published on the homepage of the city, where the budget is available for download. The document is edited in a reader-friendly way. The most important decisions and projects are briefly presented with pictures and short descriptions (Herzberg/ Cuny 2007, pp. 8).

In the next section, the diffusion of PB processes in Germany is described.

3.2.2 Diffusion of PB Processes in Germany

Against this institutional and historical background, PB was strongly promoted by non-governmental organizations in Germany at the end of the 1990s. In 1998, the network "*Kommunen der Zukunft*" ("Municipalities of the Future", own translation), where the Bertelsmann Stiftung, the Hans Böckler Stiftung and the Kommunale Gemeinschaftsstelle für Verwaltungsmanagement had joined forces, promoted the adoption of PB (Günther 2007). They offered to support the first-time adoption of PB processes and looked for municipalities that were interested in taking part in a pilot project introducing PB.[10]

A milestone in the history of German participatory budgeting was the foundation of a nationwide PB network, initiated by the "Service Agency Communities in One World", together with the Federal Agency for Civic Education, in 2003. Within this network, regular network meetings are organized and a directory of municipalities and cities that have implemented or intend to implement PB processes is published, along with their reports.[11]

The diffusion of PB processes started rather slowly in 1998 with Mönchweiler (2,997 inhab. in 2018), which was the first municipality that adopted PB. After that, PB processes were also installed in the South German municipalities Groß-Umstadt, Rheinstetten, Langen and Esslingen (Günther 2007). Further PB processes emerged between 2000 and 2004 with the support of the initiative *"Kommunaler Bürgerhaushalt"* ("Municipal PB", own translation), which was founded jointly by the Bertelsmann Stiftung and the *Land* of North Rhine-Westphalia. Cities and municipalities in North Rhine-Westphalia got the opportunity to apply for support in implementing PB processes. Consequently, PB processes were introduced in the cities of Hamm, Vlotho, Emsdetten, Castrop-Rauxel, Hilden and Monheim. The aim of the initiative was to gain insights into the decisive factors driving the successful implementation of PB, so as to derive general recommendations for further promoting PB processes (Bertelsmann Stiftung / Ministry of the Interior NW 2004). Hilden is often cited as a best practice example as PB has there already become an integral part of the political culture, having been carried out consistently since 2002. In 2005 the Berlin district of Lichtenberg (258,000 inhab. in 2018) became the first district of a larger German city to introduce a PB process, and was followed by Hamburg (1,8 million inhab.) in 2006. However, that PB process only consisted of an internet discussion,

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[10] Parts of the text in this section have been published in earlier versions: Apostolou (2014) & Apostolou / Eckardt (2022). The data come from the dataset compiled fo the analyses in this dissertation.
[11] See Bundeszentrale für politische Bildung (n.d.): www.buergerhaushalt.org.

during which citizens were involved in drawing up the budget for the year 2006. Potsdam, Köln and Leipzig are examples of other larger cities that followed in adopting PB processes.

Figure 18 shows the development of the number of municipalities with PB processes between 1998 and 2017, distinguishing between the number of established PB processes and those in preparation.[12] The number of PB processes increased over time, though not uniformly. Established PB processes showed a very slow increase reaching a peak in 2013 with a total of 103 PB processes, followed by a drop of about 30 percent in the next two years. Thereafter the number stabilized at a slightly higher level. PB processes in preparation comprise municipalities that have considered adopting a PB process without having implemented it yet as well as municipalities that employ a pre-form of a PB process like, for example, municipalities that launched a website with structured information on the budget. The number of such municipalities showed a continuous upward trend despite some minor fluctuations between 2012 and 2015. Together with established PB, therefore, there is an over-all upward movement in the adoption of PB processes in Germany. Nevertheless, the number of municipalities with discontinued PB processes also witnessed a continuous increase between 2008 and 2017, though at any point in time, their number was lower than the number of established PB processes. Many of the municipalities that have decided not to repeat PB processes made this decision due to lack of participation by citizens (Vorwerk/ Gonçalves 2018, p.11).

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[12] There is a rich literature on what should be counted as an established PB process; see for a widely used definition Sintomer/ Herzberg/ Röcke (2008), pp.164ff; Sintomer et al (2010), pp. 18.

Figure 18: German Municipalities with PB Processes (1998-2017)
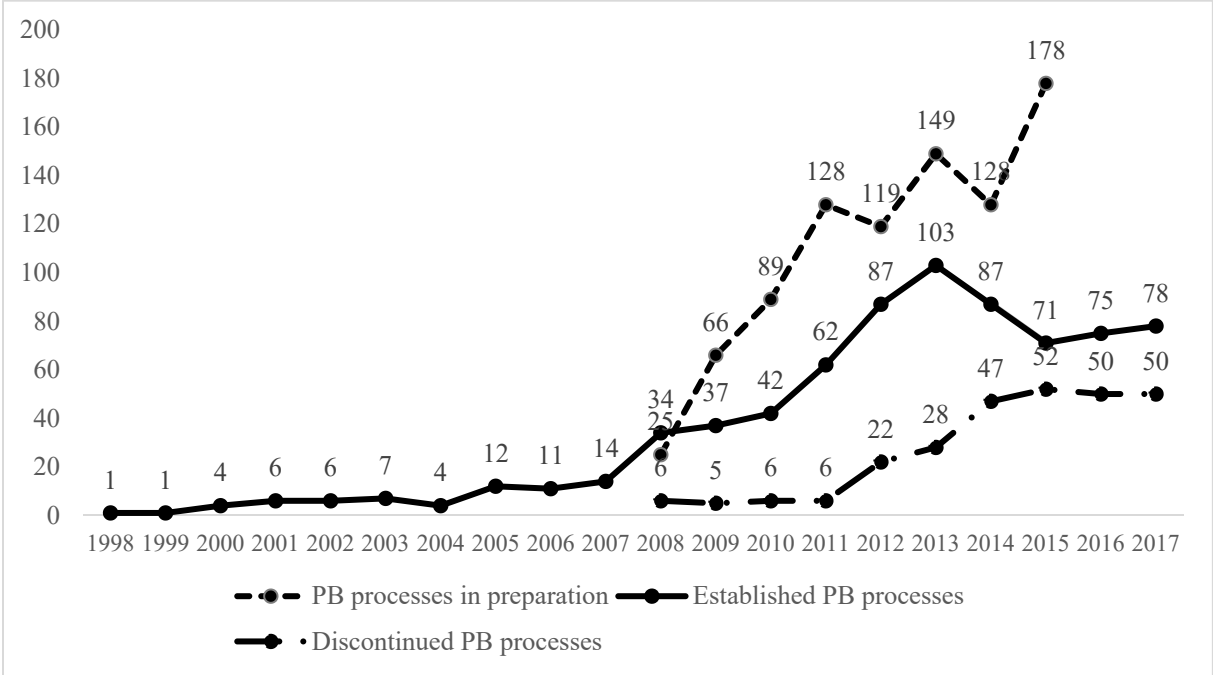
Source: Own figure based on own research and data from Ruesch/ Wagner (2014), Ruesch/ Ermert (2014), Günther (2007), Franzke/ Kleger (2010), Herzberg (2009), Sintomer et al. (2010), Ermert et al 2015, Schneider (2018), Vorwerk/ Gonçalves (2018).

The numbers show that PB has become a popular instrument. However, a far-reaching diffusion as in originating countries in Latin America did not occur, as evidenced by the fact that only around 100 out of 11,014 municipalities in Germany (as of 2018, Statistisches Bundesamt 2019, p.29) have adopted PB.

Figure 19 presents the share of municipalities that ever had a PB process adopted according to size class. While municipalities with 25- to 100-thousand inhabitants dominated, smaller municipalities with less than 25-thousand inhabitants accounted for a third of all PB processes, and larger municipalities for a quarter (Apostolou/ Eckardt 2022).

Figure 19: PB according to size of municipalities (2012-2018)
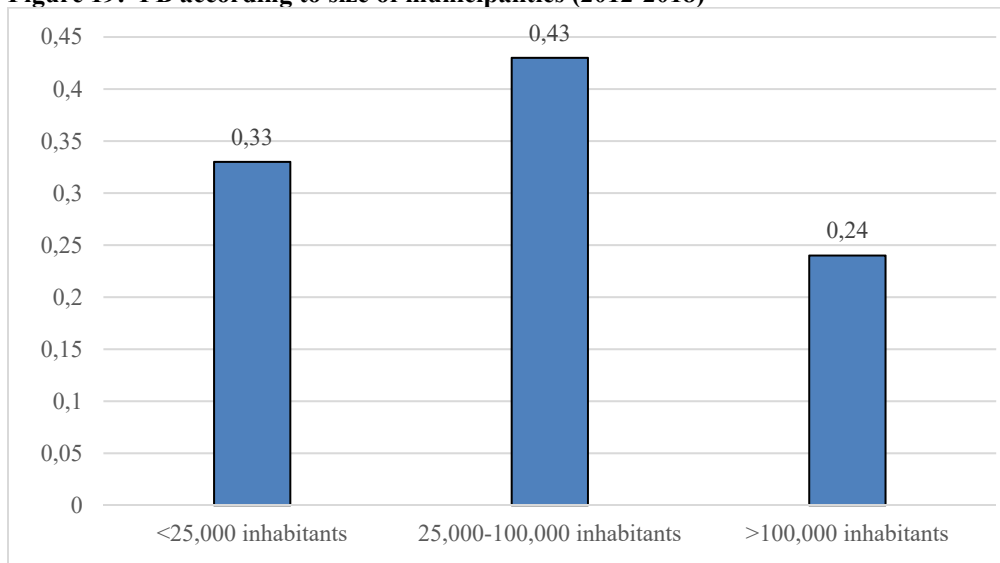
Source: Apostolou/ Eckardt 2022, based on open data downloaded from "List of municipalities" on www.buerger-haushalt.org/en/list (last access 02/09/2020).

Figure 20 shows the number of municipalities that have been registered with a status[13] with respect to the introduction of PB on *Länder* level.

Figure 20:Number of PB Cases at Länder level
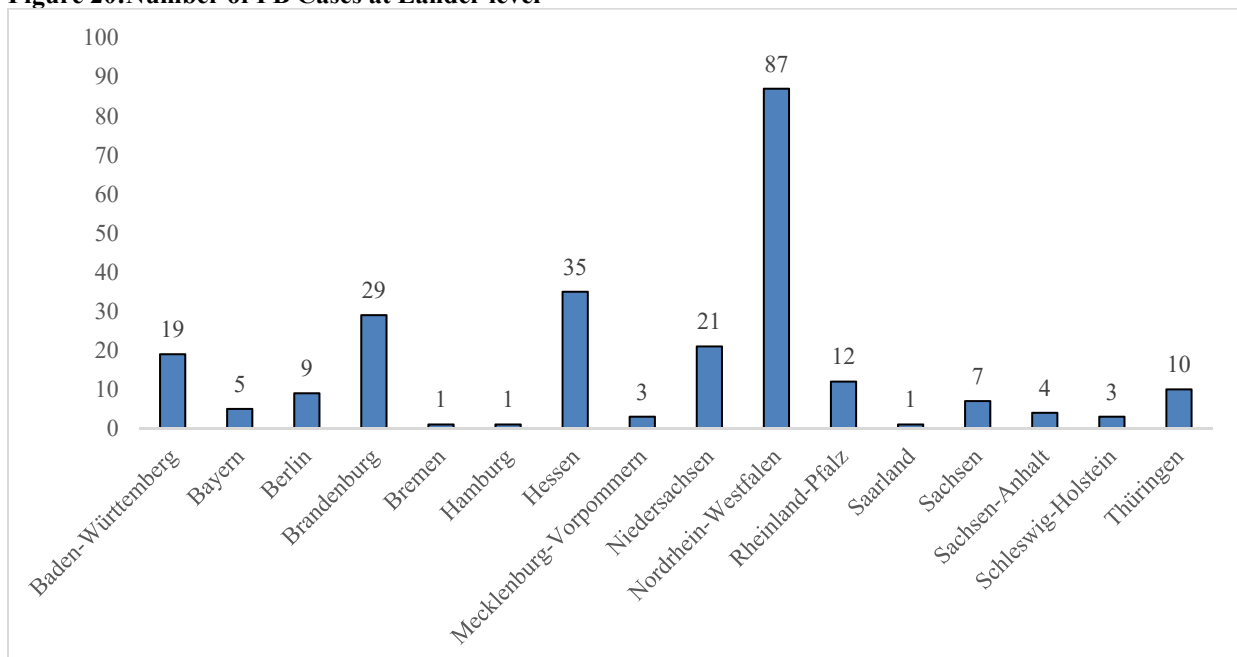
Source: Own composition, calculation based on open data downloaded from "List of municipalities" on www.buergerhaushalt.org/en/list (last access 12/07/2021).

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[13] The status ranges from pre-form over adoption and continuation to municipalities that have abandoned PB processes, they are included here so the diagram also included municipalities that once used PB.

Out of 247 documented processes, the largest number of cases, 87, was observed in North Rhine-Westphalia. North Rhine-Westphalia is the largest German *Land* by number of inhabitants (17.8 million, 2012 census). However, it is not the state with the largest number of municipalities. Rhineland-Palatinate with 2,307 municipalities or Bavaria with 2,248 municipalities exceed North Rhine-Westphalia in this regard.[14] In these *Länder*, a relatively low number of PB programs has been adopted.

Looking at this observation in the context of the financial data presented in chapter 2, it is striking that, on the one hand, two *Länder* which were among those with relatively high communalization rates, (see above 2.2.1.1) have the largest number of PB processes, whilst on the other hand, two *Länder* which also show relatively high communalization rates, Bavaria and Baden-Wuerttemberg, have a rather low number of PB processes. In addition, the *Länder* whose municipalities have been characterized with high levels of debt, North Rhine-Westphalia and Hesse, have among the highest number of PB processes. From this empirical finding it can be argued that in Germany those municipalities with particularly high levels of debt are more likely to adopt PB processes. PB seems to be an instrument that policymakers use to prepare citizens for budget cuts and to build or rebuild trust. This hypothesis will be analysed from a theoretical point of view in chapter 4 and tested empirically in chapter 5.

In terms of procedure, the German PB processes are very similar to the PB processes implemented in Christchurch, mentioned in section 3.2.1. A content analysis of the mission statements on the PB websites shows that the aims of online PB processes are mainly to provide information, transparency, and consultation (Apostolou 2014, pp.183-197). These goals comply with the three stages of information, consultation and accountability that characterize PB processes in Germany. Even though this three-stage procedure prevailed in most municipalities, PB practices vary in how these phases are organized with regard to the channel of participation, the subject of the PB, the type of input, type of participation, and the handling of proposals by decision-makers.

Figure 21 shows which channels were used in 181 PB processes that were identified between 2012 and 2018.[15]

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[14] Data available online: http://www.gemeindeverzeichnis.de/dtland/dtland.htm

[15] The numbers are mostly based on the status reports publsihed by the network *Buergerhaushalte.org* as well as on own research of websites' contents and press articles. For the cities of Bochum, Leipzig, Sankt Augustin and Konstanz information could not be found on the internet, but in the status reports and on the website buergerhaushalte.org information is available. Therefore, they are included in the observations. The result is a list of 128 municipalities that are running or ran a PB project between 2008 and 2014.

Figure 21: Channels for Participating in PB Processes (2012-2018, n = 181)
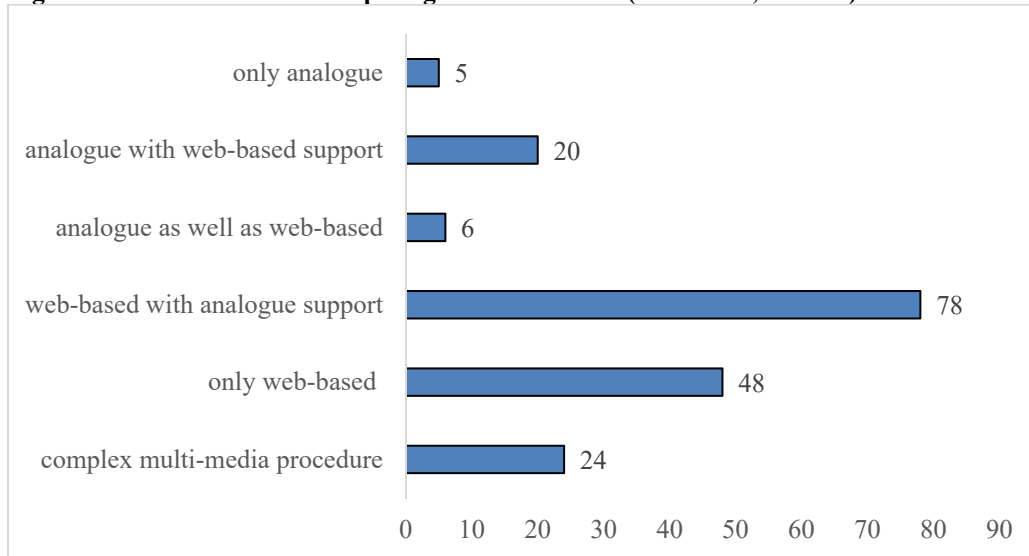
Channel	Value
only analogue	5
analogue with web-based support	20
analogue as well as web-based	6
web-based with analogue support	78
only web-based	48
complex multi-media procedure	24

Source: Own composition. Calculation based on open data downloaded from "List of processes" on www.buerger-haushalt.org/en/list, last access (02/09/2020).

The data show that Information and Communications Technologies played a pre-dominant role, with 97 percent of all PB citizen-involvement web-based. In contrast, only 3 percent of PB processes used no Information and Communications Technologies instruments at all and instead solely relied on public meetings.

Furthermore, slightly over a quarter of all PB processes were conducted exclusively via the internet. 13 percent of the observed municipalities applied a multi-channel process. A multi-channel approach is a combination of public meetings, citizen polls and Internet platforms for participation (Ruesch/ Ermert 2014, p.11.)

These numbers show that most of the observed cases rely on the internet as the main communication channel for the PB. Every city that conducts an online-based PB process offers alternative ways to take part in the process like handing in proposals by post, by phone or in person. However, empirical examples show that the online channel is the one that is used most frequently. For example, in Cologne 98 percent of all participants used the website to take part in the PB process (Taubert et al. 2011). Moreover, in the case of Frankfurt, an evaluation showed that 77 percent of all proposals in the research sample were made online. Among the top 30 proposals, 9 out of 10 were submitted online (Geißel 2013).

The channel predominately used to carry out the participation influences the manner in which the three stages of the PB process – information, consultation and accountability – are organized.

The goal of the information phase is to turn the budget, which can be a document of a few thousand pages, into a document that is easy to understand, including by non-experts (Günther 2007).

The operative starting point is the budget planning, which usually take place in spring (April/May) (Bertelsmann Stiftung/ Ministry of the Interior NW 2004). Once a benchmark resolution has been made, the information phase can commence on this basis. In municipalities where no benchmark resolution is passed, a council resolution should be passed on the draft budget so that there is a legitimate basis for discussion with the citizenry (Bertelsmann Stiftung/ Ministry of the Interior NW 2004).

Information on the municipal budget is distributed depending on the channels displayed in figure 3.5 by a variety of media, such as brochures, the internet, and press releases. This information comprises details on the expenses and revenues of the municipality. For a sample of 128 municipalities with PB processes, in the period between 2008 to 2014, Apostolou (2014) found that the municipal budget was divided into different sections to make it more understandable for citizens. In many municipalities, first the municipal tasks in general and the differences between mandatory and voluntary tasks were explained. In addition, sources of municipal revue were portrayed. Other cities provide budget information according to different items of the budget; see Freiburg for example[16]. Citizens can click on an item like schooling, culture etc., then see information about the public tasks related to that item, as well as the costs of the specific item and information on which groups benefit the most from that particular item.

Some cities provide a downloadable budget brochure in PDF format, such as the city of Halle[17]. Other cities provide information on a website launched for the PB process. [18]

Some cities such as Hilden have developed creative ideas to engage the citizens in the budgetary process. In Hilden, for the information stage of the PB process, a gymnasium was arranged as in the board game "monopoly", to create the city administration called "Hildopoly". On each playing field, walls were placed on which the costs of various budget items such as kindergarten, youth promotion, building authority, schools, fire department etc. were presented in a clear and comprehensible way. On each "field" employees from the city were presented to answer any questions related to the different budget items. Furthermore, questionnaires were sent to all households that contained questions about preferences for public spending.

The second phase, *consultation*, is the core of the PB process. During this phase, citizens are invited to debate the budget as a whole or in part. This is accomplished by town hall meetings

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[16] See Stadt Freiburg im Breisgau: https://www.freiburg.de/pb/1041335.html
[17] See Stadt Halle (Saale): http://www.rechne-mit-halle.de/haushaltsinfos
[18] See Stadt Mülheim an der Ruhr: https://www.muelheim-ruhr.de/cms/buergerhaushalt_besonders_effizient.html

or, in some cases, consultation on an internet platform – or via a combination of both. This phase takes place in the fall and, if possible, before the deliberations of the council committees (Bertelsmann Stiftung/ Ministry of the Interior NW 2004).

Municipalities have developed different types of consultation procedures, an overview of which is presented in Table 4. Each survey is similar to an opinion poll on the planned municipal budget. During a *Vorschlags-PB* process, citizens are invited to make spending and/or saving proposals for the municipal budget. In contrast, a *Bürgerbudget* allocates a fixed amount of money to citizens who can then submit proposals as to which services that money should pay for. Table 4 shows the use of the different types of PB processes for a sample between 2014 and 2017. Surveys have played a negligible role, with a share of 2 to 4 percent of all PB processes in the sample. In 2014, *Vorschlags-PB* processes clearly dominated with a share of 83 percent of all PB processes. However, *Bürgerbudgets* gained in importance during the last years. In 2014, only 15 percent of PB processes took the shape of a *Bürgerbudget.* In 2017, 41 percent of PB processes already used that type of process, while the share of PB processes that used *Vorschlags-PB* was reduced to 56 percent.

Table 4: Type of PB Process (2014-2017)

	2014	2015	2016	2017
Survey	2%	4%	4%	3%
Vorschlags-PB	83%	75%	67%	56%
Bürgerbudget	15%	21%	29%	41%
N	95	72	75	78

Source: Own calculation, data based on Vorwerk/ Gonçalves (2018), p. 9.

PB processes vary in the consultation phase also in terms of the type of input citizens can give. Figure 22 shows what was discussed in processes between 2012 and 2018. Out of 182 PB processes identified in that period, only 19 municipalities solely asked for proposals related to public expenditure. In 32 cases, processes were savings-based, meaning citizens were asked to make proposals on where to save money. They can also make proposals for shifts in the budget, like increases in specific areas of the municipal budget. In the majority of 131 cases, participants could make savings-based as well as expenditure-based proposals.[19] [20]

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[19] Own calculation based on open data downloaded from "List of processes" on www.buergerhaushalt.org/en/list, (last access 02/09/2020).

[20] In Germany, even a specific type of PB process called "*Sparhaushalte*" developed which is only about saving proposals, this will be described later in the text.

Figure 22: Input Focus in PB Processes (2012-2018, n=184)
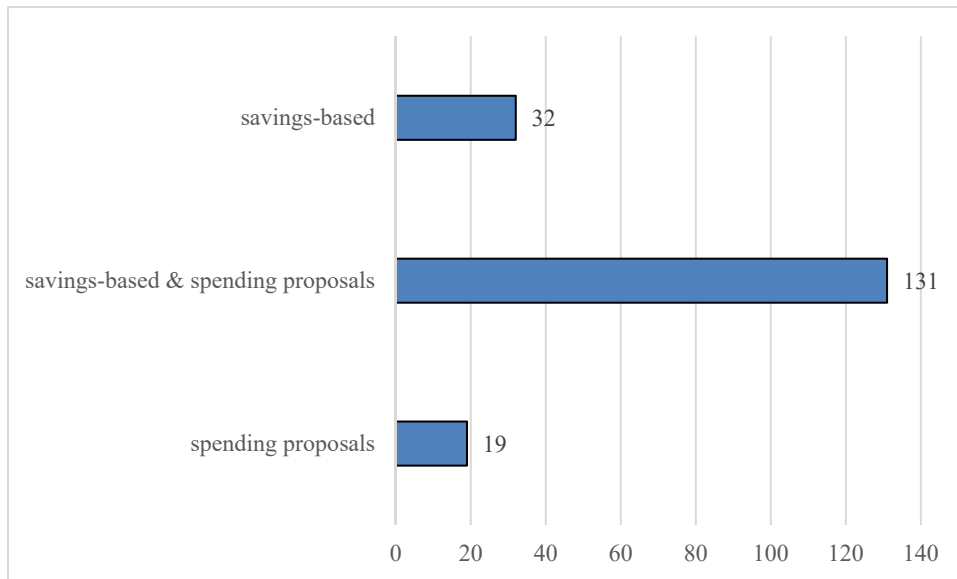
Source: Own calculation data based on Vorwerk/ Gonçalves (2018), p. 9.

The opportunity for citizens to participate during the consultation phase, and thus the impact citizens have on the budget, differs widely. This strongly depends on the kind of participation rules that citizens are granted in the PB process. These may range from the weakest form of (1) just giving feedback to proposals of the budget initiated by the municipal authorities through (2) making own proposals for changes to the budget to the strongest form of (3) deciding on which measures should be realized in a given budget. Figure 3.7 illustrates that 54 percent of PB processes enabled citizens to make proposals, with another 32 percent enabling them to both give feedback and make proposals. In only 4 percent of PB processes, citizens had the right to decide on the budget draft, while another 5 percent provided mixed forms of participation (Apostolou/ Eckardt 2022, p. 35).

Only 7 municipalities developed a process that redirects more power to the citizens. In these cases, a fixed amount of money is provided by the local government for certain projects about which citizens can decide. [21]

This again highlights that German PB processes at the municipal level are predominantly instruments for consultation, not for direct democratic co-determination.

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[21] See Stadt Senftenberg: https://www.senftenberg.de/B%C3%BCrger/B%C3%BCrgerhaushalt-/

Figure 23: Participation Options granted in PB Processes (2012-2018, n=184)
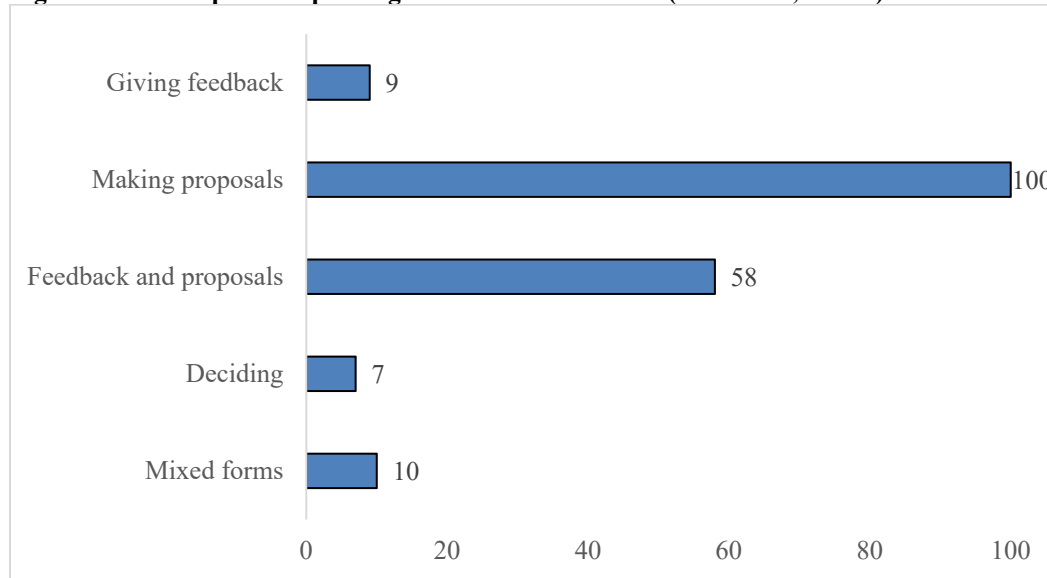
Source: Own calculation based on open data downloaded from "List of processes" on www.buergerhaushalt.org/en/list (last access 02/09/2020).

Depending on the dominant participation channel, consultation can take place via public meeting or via an online platform. If public meetings take place, participants are often randomly selected and receive a personal invitation, in some cases from the mayor, to attend the citizens' forum. In addition, participation is possible for any interested citizen. Meetings are usually organized in the evening. The mayor and administrative staff take part at the meetings to explain the municipal budget and to answer questions raised by the participants of the meetings. Participants can ask questions and make proposals. Prioritisation of the proposals usually does not take place in the case of public meetings. However, each citizen receives a personal answer by letter, if and when his request is implemented (see also accountability) (Herzberg et al. 2010, p. 14/15).

Where PB processes are only carried out online, the actual consultation phase can be divided into different stages in most cases. At first, citizens have the opportunity to submit proposals on a platform. These platforms usually have an interactive character. That means participants can comment on each other's proposals and rate them. Some cities also provide chat forums for that purpose, as in the city of Jena. Most of these platforms or chat rooms have a moderation team that guides the discussions and makes sure the guidelines are respected. There are big differences in the way that the proposals are organized on the platforms. While in some cases all proposals appear in the same place, in others the proposals are divided into different categories, such as in the city of Cologne (1 million inhab.in 2018). The online PB process there was organized according to topics. Citizens were invited to make, comment on and rate spending and savings proposals on specific budget areas such as "Green Spaces", "Streets, Paths and

Squares" and "Sport" (Taubert et al. 2011). Some municipalities additionally provide compre-hensive search and filter tools which makes it easier to find individual proposals, like the city of Trier. Once the period for submitting proposals and discussing them is over, the proposals are subject to evaluation by the participants, resulting in a ranked list of proposals. At the next step, the administration checks these proposals for feasibility, their effect on the budget etc. (Apostolou 2014).

After the budget has been decided and displayed or approved, the accountability for the PB procedures takes place. This usually happens at the end of the year but, in some cases occurs in the first quarter of the following year (Bertelsmann Stiftung/ Ministry of the Interior NW 2004). The accountability phase is centred around giving feedback on accepted and refused proposals. Feedback is usually given on the online platform as is the example of the city of Münster. At the end of a PB process, the city administration revises the proposals, that receive the most votes and gives them on to the city council. The decision made by the council with regard to the implementation of the proposal is published on the online platform (Stadtverwaltung Mün-ster 2020). In the online PB of Cologne, the city council diligently commented on the first one hundred proposals in each of the areas that were open for discussion. The proposals were pub-lished together with the comments on the website and could be viewed there alongside the responses of the city council and of the responsible committees. The city of Hilden responds to any suggestion with a personal letter, informing the applicant what has become of their proposal (Herzberg et al. 2010, p. 41).

Accountability is important for the acceptance of PB processes and the motivation to participate at all. Therefore, it is surprising that most cities and municipalities do not provide detailed feed-back on the outcome of the PB process. Figure 24 gives an overview of the different types of feedback given.

23 cities published detailed feedback, classed as feedback which is linked to every individual proposal on the internet platform. 28 other cities use the same method, but in addition provide information about the status of implementation. 64 municipalities provide feedback in one co-herent document, but do not give detailed feedback for every proposal in the same place where the proposals have been posted. 59 of the PB processes did not receive any follow-up monitor-ing. This shows that for a majority of PB processes, the city council does not provide detailed feedback, potentially leading to frustration among the participants who do not know what hap-pened to their proposals.

Figure 24: Accountability (2012-2018, n=174)
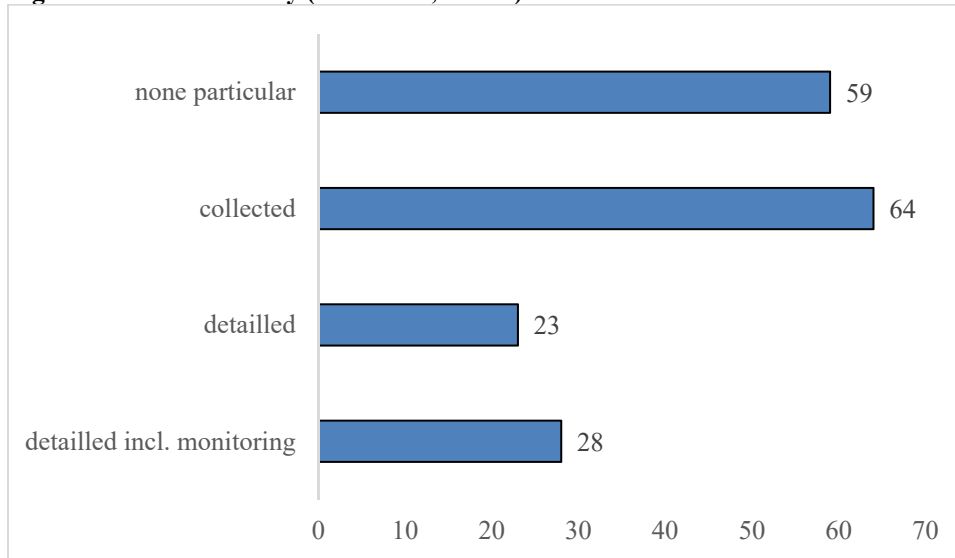
Source: Own calculation based on open data downloaded from "List of processes" on www.buergerhaushalt.org/en/list (last access 02/09/2020).

This section described how PB processes in Germany are usually organized. A three-stage procedure consisting of the stages *information, consultation* and *accountability* has emerged. Moreover, differences in the implementation of PB projects with regard to their channel of participation, their input focus, the options for participation and the form of feedback on the results of the PB project were highlighted. In most of the observed cases, the internet is an important channel of the PB process. A comparison of the average population size of municipalities that use the internet as a main channel with those that primarily rely on public meetings (but might use the internet as an additional channel) shows that in general the relatively larger cities carry out PB processes solely online.

Thus, larger cities seem to rely more on the internet as participation channel. Furthermore, there is a trend towards using a *Bürgerbudget* that allocates a fixed amount of money to citizens who then can submit proposals for what services these resources should be spent for.

3.2.3 A German Peculiarity: Saving Budgets

In Germany, PB processes are implemented as part of an effort to make administration more efficient and to better align the provision of public goods and services with the citizen's preferences, citizens who are seen as customers in the New Public Management approach. There is an emphasis on informing citizens about public finances and obtaining a public opinion about the local budget. As shown in in figure 22, many PB processes are *savings-based*, asking par-

ticipants to make proposals to cut expenditures or improve revenues; in other cases, they represent a blend of savings and expenditure-based proposals. This led to the development of a specific type of PB process, which is called *"Sparhaushalt"*. This type of PB process is especially implemented by financially strapped municipalities. The focus in such a program lies on debating how the municipal debt structure can be changed by adjusting taxes and local expenditures. This type of program puts an emphasis on explaining the financial situation of the municipalities to the citizens in detail. The focus during the discussion phase is on debating about where the municipality can save money. Citizens are asked to make austerity proposals or they are asked to take votes in which public areas costs should be cut and which areas should be exempted from cuts (Holtkamp/ Batghe 2012, pp. 47-64, Märker 2011).

There are some prominent examples for that type of procedure in Germany, such as in the cities of Essen (159,360 inhab. in 2019, Eurostat) and Solingen (583,109 inhab. in 2019, Eurostat). Between 2009 and 2011, these cities adopted PB procedures that were officially called *„eine bürgerbeteiligte Haushaltssicherung",* which translates into citizen-participated budget protection. Both cities had to present a budget protection concept to avert the threat of over-indebtedness. Thus, citizens were invited to discuss this concept. The focus was on the evaluation of savings proposals and of proposals to increase public revenue. Dealing with savings proposals only was necessary in order to get the additional expenses for the PB process approved by the municipal supervisory authority (Servicestelle Kommunen in der Einen Welt, 2011, p. 11).

In 2009, the city council of Essen did not want to decide on budget cuts alone and thus chose to publicly debate its own consolidation proposals. There was a target for 100 million euros in public spending that had to be saved. One part was to be achieved through internal administrative measures; the other part was presented to the citizens in the form of 78 measures and 16 ideas. The citizens of Essen were given the opportunity to review these proposals and to take votes on their preferred measures. Thus, the city council got an impression of what measures would be supported or rejected. In addition, citizens were invited to hand in their own proposals on how spending could be reduced, or how additional revenues might be generated. 3,700 citizens took part in the PB process and budget cuts of 117 million euros were supported. According to the city administration, budget cuts in the social and educational sectors (support rate here at eleven percent) were in general rejected, while cuts in other budget positions, for example those that concerned expenditure items in public administration, were more likely to be accepted (with a support rate of 85 percent) (Stadt Essen 2011). The procedure was repeated the following year, but the participation rate was significantly lower. In the city of Essen, it was

then decided not to continue the PB process as the city was no longer under financial pressure (Stadt Essen 2011).

The city of Solingen is another prominent example for its *"Sparhaushalt"* in 2010, which also gained international recognition (Cabannes 2017). Here too, the background was the imminent over-indebtedness that local government sought to avert. The interior ministry of the *Land* NW threatened to set up a "state commissioner" who would make the essential decisions for Solingen in place of the council and the mayor. The declared goal of the administration was to save 45 million euro. The focus of the PB process in Solingen was completely on the reduction of municipal expenditure and the increase of revenues. Here too the budget supervisor made it a condition that no additional expenditures, but only savings, were put to the vote (Banner 2010, p. 26). The *Sparhaushalt* took place via voting on the internet and could be implemented at relatively low costs of 50,000 euros (Naßmacher 2010, p. 11). In this combination, it was possible to involve citizens and generate approval for savings proposals (Märker/Wehner 2011).

From the city´s administration, 248 measures which accounted for 22 million euros of saving were proposed and presented to the citizens via the internet. About 3,600 citizens have registered on the platform and voted there. This accounts for 2.2 percent of the overall residents and was considered a relatively good participation rate. The participation was followed by an internal evaluation and political consultations. In the summer of 2010, the council decided on the budgetary protection concept. Due to the PB process, citizens could avert reductions in public transport as well as the closure of two district meeting halls, a stadium and indoor swimming pools. Smaller measures such as increasing the dog tax and reducing subsidies were supported by the participants (Servicestelle Kommunen in der Einen Welt 2011, p.26). However, the success in savings cannot be attributed to PB process in a monocausal way. The overall concept was geared towards saving in Essen and Solingen, because a stabilisation of the municipal budget was required by law (Servicestelle Kommunen in der Einen Welt 2011, p.11).

These experiences nevertheless show the positive effects that even *Sparhaushalte* can achieve, namely that the public is better informed about the finances of their municipality and more aware of the budget situation. Citizens even came up with concrete saving proposals. These examples show that citizens used their opportunity to influence the allocation of public resources even when faced with a situation of huge local debt. Thus, even if the critics are sceptical about PB programs initiated in indebted cities, they may have benefits by making finances

more transparent, by creating awareness for the financial situation of the local public sector and by including the citizens in the decisions on where to save money in areas that directly affects their lives (Servicestelle Kommunen in der Einen Welt 2011, Cabannes 2017). Furthermore, the emergence of this specific type of savings budget in Germany reinforces the hypothesis that municipalities in fiscal stress are more likely to adopt PB in Germany.

3.3 Literature review of PB

As one of the most popular democratic innovations, the phenomenon of PB has been a frequent subject of academic studies in different disciplines including economics, business administration, public management, sociology, urban planning and political science. Moreover, international organisations such as the World Bank, as well as government bodies and NGOs, have published numerous reports and handbooks on the topic of PB practices (see e.g. Shah 2007, OECD 2003, ENGAGEMENT GLOBAL gGmbH 2014). In this section, an overview of existing research findings is presented, followed in the next chapter by a theoretical model and then hypotheses with regard to the diffusion of PB in Germany.

The aim is to construct an overview of what research exists on PB and to identify research gaps. Section 3.3.1 summarizes findings on adoption and diffusion of PB processes. Section 3.3.2 outlines studies that examine the impact and process design of PB. Section 3.3.3 revises critical contributions with regard to PB.

3.3.1 Adoption and Diffusion of PB – Research Findings

While there is extensive literature on the diffusion of policy innovation in general, which will be discussed in detail in the following in 4.1.4, literature regarding specifically the diffusion of PB programs remains scarce. Most of what literature there is analyses adoption and diffusion of PB by using qualitative methods across local governments within a country (Hernández Medina 2007, Wampler/ Avritzer 2005, Aleksandrov et al. 2018, Bartocci et al. 2018).) or within Latin America (Goldfrank 2007), or else studies the overall global diffusion of PB (Goldfrank 2012, Ganuza/ Baiocchi 2012, ENGAGEMENT GLOBAL gGmbH 2014).

One common conclusion in the literature describing PB diffusion is that there are at least two different phases in which global diffusion of PB happened (Ganuza/ Baiocchi 2012, Cabannes 2004). The idea of PB was first promoted by the Workers' Party in Brazil in the 1990s andf then it became a popular tool within non-governmental organizations (NGOs) throughout Latin

America. The tipping point for the global diffusion has been identified as the World Social Forum in 2001 to 2003, where PB gained international popularity and a global diffusion of PB between 2001 and now was triggered (Porto de Oliveira, Baiocchi 2015, Ganuza/ Baiocchi 2012, Sintomer et al. 2008).

The first PB program in Porto Alegre was introduced in 1989 as a result of the end of Brazil's military dictatorship. PB emerged from the demand for more political participation after a long period of political repression. It became both the model and the central point of reference for other PB experiments (Baiocchi 2015). In that first phase of diffusion, PB processes became widely recognized as central to the Worker´s party politics of combining redistribution with broad-based participation. As PB was successful at combining goals such as social justice with improved transparency in public finances and more effective governance, the Worker´s party could successfully expand its electoral influence in municipal governments throughout Brazil in the late 1990s (Huber 2010). Thus, PB adoption in the first phase happened mostly for political reasons and was strongly connected to goals such as deepening democracy, empowering citizens, redistributing financial resources and improving social justice (Cabannes 2004, Baiocchi 2015, Cabannes/ Lipietz 2018).

Four factors have been found to make the adoption of PB more likely. These are: "strong mayoral support, a civil society willing and able to contribute to ongoing policy debates, a generally supportive political environment that insulates PB from legislators' attacks, and financial resources to fund the projects selected by citizens" (Shah 2007, p. 24). Other factors which have been found as influential for PB adoption in quantitative studies are partisan affiliation of the mayor elections, and the existence of policy networks (Wampler 2009, Spada 2010, 2014). Baiocchi et al. (In: Alsop et al. 2006, p. 95-120), using both qualitative and quantitative methodology, confirm that the Worker´s party is responsible for the rise of PB processes in the first phase of PB adoption. Additionally, PB processes are rather introduced in larger municipalities. Another finding is that in the first phase of PB adoption, committed mayors played a crucial role in adopting PB programs and making them successful. Kingdon (1995, p. 179) coined the term policy entrepreneur for these kinds of committed politicians. He describes them as persons "willing to invest their resources-time, energy, reputation, money-to promote a position in return for anticipated future gain in the form of material, purposive, solidary benefits." In the policy diffusion literature, policy entrepreneurs have been identified as important driver for the adoption of political innovations (Mintrom 1997).

Wampler (2009) analyses the influence of two new actors which he calls policy advocates and pro forma adopters. To detect their influence on PB adoption, he conducts interviews with experts and evaluates the experience of eight Brazilian municipalities that adopted PB between 1989 and 2004. His analysis indicates that the PB programs initiated by policy entrepreneurs are the most successful programs. He explains that with the fact that the re-election of that type of politicians strongly depends on the success of the program. Thus, policy entrepreneurs have strong incentives to invest a lot of resources to make the program successful. Moreover, Wampler (2009, p. 33) finds that policy advocates support certain aspects of PB, but they are not willing to invest as much as the policy entrepreneurs as they do not base their re-election chances on this particular policy program. Pro forma adopters only implement a PB process because they were urged by their political party or by an international organization to adopt PB. However, according to Wampler´s research, pro forma adopters are not willing to delegate the necessary authority to the citizens as well as enough time, energy or resources to make PB successful. Thus, PB processes implemented by pro forma adopters will not have a real impact on the decision-making process and can lead rather to cynicism instead of empowerment. Based on these findings, Wampler recommends that adoption among policy advocates should be encouraged, but that adoption among pro forma adopters should be discouraged. Entrepreneurs implement the PB processes with the greatest success because they are willing to dedicate the necessary resources to the program and to transfer authority to the citizens to make policy decisions.

Thus, literature identifies the Worker´s party as one of the most important drivers for PB adoption in the first phase. It is also believed to have influenced diffusion in later phases by actively promoting PB in a variety of contexts, such as the numerous World Social Forums hosted by Porto Alegre.

Since then, PB has been recognized by large international institutions such as the United Nations (UN), the European Union and the World Bank. This helped legitimize PB as a valuable policy initiative on the global stage (Goldfrank 2012, Porto De Olivera 2017). These organisations, in cooperation with NGOs, promoted PB diffusion in the developing world (Baiocchi 2005, Baiocchi et al. 2011). Whereas PB in Brazil was not imposed by the state or by national-level governments, nor funded by international donors, instead being self-adopted at the municipal level using city resource, in the second phase, many PB programs were imposed by the state or supported by international agencies (Goldfrank 2011, Alves/ Allegretti 2012).

A study of PB diffusion in South Korea shows that PB diffused much faster and was much faster integrated into municipal constitutions when the implementation of PB became obligatory in 2011. After 2011, it took only three years until the remaining 60 percent of local governments, that had not adopted PB previously, introduced PB processes. In line with the diffusion of policy innovations literature, another finding of the study is that early PB adopters were geographically proximate (Soonhee 2016).

Porto de Oliveira (2017) explains the global process of diffusion based on expert interviews, the observations of processes and the analysis of documentation of processes analysis at the local, national and international level. With that approach, he explains three fundamental stages of international PB diffusion, which he calls internationalization, legitimization, and large-scale diffusion (Porto de Oliveira 2017, p. 27). He identifies the so-called "ambassadors of participation" as important for the international diffusion of PB programs. According to him these ambassadors are local decision-makers as the mayor of Porto Alegre, whose political influence and early experiences with PB processes allowed them to make PB globally popular. Porto de Oliveira additionally emphasises the importance of international relations in PB diffusion. As an example, he mentions the role of the "Extraordinary Secretariat for Fund-Raising" in Porto Alegre whose goal was to find international sources of funding. This secretariat was explicitly tasked with pursuing relationships with foreign partners. That was an important channel to further the global diffusion of PB processes (Porto de Oliveria 2017, p.75). Furthermore, he identifies networks of politicians that were important for the diffusion of PB from Porto Alegre to Europe. He highlights the role of the mayors of Porto Alegre and Saint-Denis, France that met to form international relationships. This was a milestone for the diffusion of PB throughout Europe (Porto de Oliveria 2017).

In the first phase of diffusion, PB was conceived as "a highly symbolic tool associated with left policy of the Worker's party" (Bartocci et al. 2018, p.70). Thus, it was mostly seen as a program that is introduced to strengthen the political influence of the civil society and to further democracy. During the later phases of diffusion, especially outside Latin-America and Southern-Europe, other factors have been identified as being important. There is a strand of literature that analyses this changed logic of PB adoption. As other motives besides the political, a community-building and a managerial logic led to the adoption of PB processes in the later phases of diffusion. PB adoption under a community-building logic aims to improve the cooperation between elected officials and citizens. PB adoption under managerial logic can be described as more technocratic management in response to managerial problems, with the goal to improve

financial efficiency and optimise public resources and service delivery (Cabannes/ Liepitz 2018, pp. 69 sub seq.).

Furthermore, municipal budgetary crises and the accompanying legitimacy crisis of municipal democracy have been mentioned as reasons for introducing PB processes (Sintomer et al. 2010, p. 112-113, Holtkamp 2012, p. 267, Röcke 2009, Cabannes/ Lipietz 2015, Cabannes/ Liepitz 2018). German decision-makers introduced PB processes for managerial reasons, emphasising finance optimization and consultation instead of on improving deliberation quality – as had been the focus of the original PB processes (Cabannes/ Liepitz 2018).

Holtkamp (2012, p. 268 su seq.) describes some additional explanatory factors for PB adoption in Germany. He mentions initiatives such as *"Kommunaler Bürgerhaushalt"* ("Municipal PB", own translation), which was founded jointly by the *Bertelsmann Stiftung* and the *Land* of North Rhine-Westphalia, as well as reform discourses in municipal administration such as the model of the *Bürgerkommune*, the citizens' municipality, as factors that motivate the adoption of PB. He also believes that left-wing parties, especially *Bündnis 90/Die Grünen* and *Die Linke*, which have listed citizen participation on their agenda, push the adoption of PB processes. In some eastern German municipalities, *Die Linke* has been identified as a driving force for PB adoption (Orbit 2010, pp. 9-11). Other studies have concluded that PB in Germany is not linked to the agenda of a particular party because even municipalities with a conservative or neoliberal administration adopt PB programs (Sintomer et al. 2010, p. 51-52).

Holtkamp (2008a, p. 224) states that directly elected mayors were especially motivated to adopt the first PB projects in Germany. He does not see any efforts from the citizens to introduce a PB process bottom-up.

Case studies concerning PB adoption in Germany find that actors who function as political entrepreneurs such as the mayor, municipal treasurer or other persons that can be considered a local leader have a positive impact on PB adoption, as those persons do the publicity and persuasion work that is necessary to adopt such a process (Bertelsmann Stiftung/ Ministry of the Interior NW 2004, p.8, Herzberg et al. 2004, p.14). However, systematic studies that analyse which factors lead to the adoption and diffusion of PB processes in German municipalities are lacking.

3.3.2 Goals, Process Design and Outcomes of PB – International Research Findings

In the following section, literature concerning the goals, effects and process design of international PB processes are summarized, alongside other factors that have been found to make PB successful. First, results of research analysing the original Brazilian PB cases are presented. As PB originated in a Brazilian town, PB there has the longest tradition, and it has been studied extensively. Subsequently in this section, international comparative studies are presented.

Early research of Brazilian PB cases consists mostly of single case studies analysing process design and outcomes of a PB process (De Sousa Santos 1998, Abers 2000, Avritzer 2002, 2006, 2008, 2009; Nylen 2003, Menegat 2002, Baiocchi 2005, Marquetti et al. 2011). These studies suggest that the main goals that were hoped to be achieved with PB were indeed achieved.

One important goal of PB processes in Brazil, the redistribution of resources to economically disadvantaged parts of the population, was confirmed by case studies of Belo Horizonte's PB program and of Porto Alegre's PB program. Other studies analysing empirical data for the PB process of Porto Alegre confirmed that more resources were spent in poor municipalities than in middle- and upper-income municipalities (Marquetti et al. 2011, Wampler 2012).

Another important goal associated with PB in Latin America is the empowerment of citizens. Studies found that PB led to significant administrative reform that gave more authority to the citizens (Goldfrank 2011, Baiocchi et al. in: Alsop et al. 2006, p. 95-120). Studies confirm that PB processes in Latin America were successful in including poor and traditionally excluded groups of society that are characterized by a relatively low socioeconomic status, low incomes and lower levels of education. Furthermore, it often included women in public decision-making (Abers 2000, Avritzer 2009, Baiocchi 2005, Wampler 2007). The empowerment of these usually marginalized groups has had important distributive effects. Marquetti et al. (2011) use time series data from Porto Alegre to estimate the effects of PB. They find that PB has prompted decision-makers to spend public resources more efficiently and that public spending has become more transparent. According to their study, PB helped to improve living conditions of economically disadvantaged groups by changing priorities that used to favour better-off districts. An example for that is that these groups have been granted an improved access to drinking water and are connected to the sewage system.

These positive results were also confirmed by cross-case comparative studies and large-*N* quantitative studies. Baiocchi et al. (2008, p. 95) use quantitative data from all 5,507 municipalities in Brazil between 1997 and 2000 to estimate the effects of PB using a regression discontinuity design. They estimate mean treatment effects on public finances, public service delivery, human

development, growth and inequality. The most important results of the econometric analysis are that PB reduces "extreme poverty by over 40 percentage points", rises the percentage of "municipal expenditures allocated to health and sanitation by over 6 percentage points" and reduces "income inequality by 0.05 percentage points". Interestingly, the financial deficit decreased by 3 percentage point where PB was adopted (though the coefficient of this variable not significant).

Boulding und Wampler (2010) measure the effects of PB programs on social spending and on several indicators of well-being using a dataset of Brazil's 220 largest cities covering the period from 1991 to 2000. The results of their regression analysis reveal that municipalities that employ PB spend more money on health and education programs.

Touchton and Wampler (2014) expand the dataset used by Boulding und Wampler (2010) to embrace all Brazilian municipalities with at least 100,000 residents ($N = 253$) from 1989 to 2008. They perform a regression analysis using cross-sectional time-series regression with random effects and clustered standard errors.

Their regression results show that PB programs lead to significant rises in "health care expenditure", surges in the "number of civil society organizations operating within a municipality", and decreases in "infant mortality rates". Another result is that these effects are much stronger when PB programs have been in place over a long period of time. They also find that the effects of PB programs on well-being are stronger if implemented by mayors from the Workers' Party.

Touchton and Wampler (2019) use a dataset of 114 Brazilian municipalities with PB programs from 2009 to 2016 to evaluate whether certain characteristics of PB programs explain differences in local infant mortality rates. They estimate relationships between "PB rules" and "infant mortality" using ordinary least squares (OLS), with standard errors clustered on the municipality. As independent variables, they include the "range of participation", "the scope of deliberation" and the "embeddedness within local institutions". To measure the "range of participation", they consider the number and type of participation channel, for example face-to-face meetings or online. Furthermore, they incorporate the variable "frequency of meetings" and consider whether governments also "provide transportation or childcare support to ease the time and financial costs of participation". To capture the full scope of public deliberation, they also take into account "the range of policy issues eligible for deliberation", and whether additional policy and budgeting workshops to educate participants are organized. Furthermore, they test whether "PB meetings that are more deeply embedded within existing policy-making processes" are more effective than those that are not embedded. The most important results are that the existence of PB programs leads to lower "infant mortality rates" when there is a wider range

of participation, the scope of deliberation is larger and PB is embedded in ongoing policy-making venues. Thus, whether a PB program is successful also depends on the institutional design of the process.

Goldfrank (2002, 2007) finds that a "high degree of participant decision-making power", a "wide range of issues under debate", an "informal structure", and a "decentralized nation state" where municipal government has its own resources and responsibilities are all factors which predict a successful output of PB processes in Latin America.

In addition to improvements in social justice, PB processes also led to significant improvements with regard to the management of municipal resources.

Based on analysis of 25 municipalities in Latin America and Europe, Cabannes (2004) finds that in many municipalities, the PB process led to an increase in tax revenues and a decrease in tax crime. Property tax wrongdoing in Porto Alegre fell from 20 percent to 15 percent, and, in less than ten years, property taxes developed from 6 percent to almost 12 percent of the municipality's revenues. A reduction in tax delinquency due to PB was also noted in the Brazilian city Mundo Novo. Cabannes argues that the reason for this is the greater transparency of public administration made possible by a PB process.

Baiocchi et al. (In: Alsop et al. 2006, p. 95-120) measure the impact of PB on empowerment, examined by a matched-pair study comparing effects of PB on agency and opportunity structure. Their dataset contains 5,403 municipalities in Brazil for the period 1991 to 2000. They measure the impact on "municipal finances", "public service delivery", "human development", "growth" and "inequality". They find positive links between introducing PB and reducing extreme poverty and inequality, and PB and a better access to water infrastructure.

Zamboni (2007) estimates a treatment effect caused by PB on different governance variables using the same approach used by Baiocchi et. al (In: Alsop et al. 2006, p. 95-120). He performs matched-pair analysis for 10 pairs of Brazilian counties with and without PB but sharing otherwise similar socioeconomic and political characteristics in the years 2003 and 2004. He estimates the effects of PB processes on the quality of local governance using official audit reports as a measure of governance. He argues that the quality of governance can be measured by the amount of violations of public management regulations revealed by auditors. The governance indicator measures different dimensions of the performance of the local public administration including the measurement of how much the government follows the administrative rules and different indicators to assess the quality of public service. Zamboni´s analysis shows that 7 out of 10 counties that employ PB have better governance indicators. Furthermore, in 7 out of 10 counties, in which PB places are in place, public revenues have increased. However, counties

with PB processes also had irregularities concerning governance. Thus, Zamboni concludes that PB alone is not a satisfactory solution for creating better governance.

Studies that compare PB programs in different countries show that as PB has adopted to local contexts, different types have evolved that vary with regard to goals of the process, population size, municipal resources and mode of participation. There are those with "strictly political goals along with the idea of democratizing democracy" (Cabannes 2004, p. 38). There are other types of programs that "pursue social goals such as helping invert priorities or generate social bonds" (Cabannes 2004, p. 38). Then, there are PB processes that are supposed to fulfil administrative goals, whereby the PB process is intended to improve the efficiency of public administration, and to make more transparent how public resources are used. PB adopted for managerial reasons will produce different outputs compared to those implemented for political reasons, such as in the improvement and modernisation of the administrative apparatus in Germany (Cabannes 2004, Cabannes/ Liepitz 2018).

Based on PB case studies from all over the globe, Sintomer et al. (2008, 2010) develop a classification scheme of the different types of PB processes. On that basis, they define six ideal types of PB that differ in terms of socio-political context, goals, rules and procedures of participation, dynamics of collective action, and the relationship between conventional politics and participatory procedures (see also section 3.1.3).

Talpin (2007) differentiates effects in different countries using a micro-sociological research design to analyse the effects of three PB processes in France, Italy and Spain. His central finding is that the participants' attitudes towards participation changes in the process. This can foster exclusion in some cases, while it fosters inclusion in others. If participants are disappointed by their specific PB experience, they become cynical about participation and politics in general. However, in cases that are considered successful, PB processes foster democratic engagement. Participants report that they have become better educated with the political environment and decision-making process. They also attribute greater participation in social movements and political parties to this.

Furthermore, a comparative analysis of three cases of PB in Germany, France, and Great Britain shows that PB processes in different countries produce different results (Röcke 2009). Röcke uses expert interviews to analyse the relation between concepts of citizen participation as the citizens' commune and PB processes, the degree of "procedural and political innovation" of PB, and the similarities and differences between different concepts of citizen participation. The analysis of the three PB processes leads her to the conclusion that PB processes in Europe rather

lead to the introduction of "a user-oriented administration, rather than furthering a democratisation of democracy" (Röcke 2009 p.9).

Ryan and Smith (2012) use a blend of qualitative and quantitative research design, performing a comparative analysis of PB by conducting a fuzzy-set qualitative comparative analysis with a small-*N* study of six very different PB initiatives from around the world, including PB processes from Brazil, France and Germany, Canada and Argentina. They analyse how the outcome of PB is influenced by the variables "civil society demand", "participatory leadership strategy"," fiscal independence" and "bureaucratic support". A central finding is that if there is neither "fiscal independence", "political leadership" nor "civil society demand", the presence of initial "bureaucratic support" is enough to transfer budgetary decision-making power to citizens. Based on this finding, they suggest that "it is not an absence of participatory leadership per se, but rather de-politicisation of the process that is the positive contributor to outcomes. It may be that a key factor in institutionalised participatory democracy in some localities is that the handing of budget decisions over to citizen participants is not an ideological issue that divides political parties." (Ryan/ Smith 2012, p. 113).

There are two studies comparing PB processes worldwide. Shah (2007) summarises the principles of PB around the world, focusing on developing countries, and analyses benefits as well as potential risks. The publication consists of five regional surveys and seven country case studies.

A study published by ENGAGEMENT GLOBAL gGmbH (2014) analyses PB processes around the globe and classifies them according to the ideal type scheme developed by Sintomer et al. (2010). Generally speaking, the global comparison of PB programs shows that PB led to far more fundamental systemic change in the global South compared to the global North. PB processes in the global North do not lead to profound changes of living conditions and policy-making process as was the case in Brazil. PB processes in Europe are mostly of a consultative nature. Thus, real political impacts from PB in Europe are not yet seen. Nevertheless, one positive conclusion of the study is that PB around the world have been found to be a tool that builds trust between municipal governments and residents.

Qualitative and quantitative research for the Latin-American and especially Brazilian PB cases have mostly confirmed the positive effects that are associated with PB programs. In addition, studies have found that the effectiveness of the outcomes of PB processes depend on its institutional design and embeddedness in local institutions. Effects on health and living conditions of the poor are larger when PB is in place over a long period of time.

3.3.3 Effects and Process Design of PB in Germany

This section summarizes existing research into the effects of PB processes implemented in Germany. It consists largely of single case studies evaluating PB processes in individual municipalities or cities (Klages/ Daramus 2007, Taubert et al. 2011, Geißel 2013, Schneider 2011, 2012, 2013, Kersting et al. 2013, Franzke/ Roeder 2014). These studies rely mostly on qualitative research methods such as expert interviews, surveys and analysis of documents related to PB processes. While these studies provide an in-depth analyses of single processes and allow best practice cases to be identified, they provide few general conclusions regarding the design or impact of PB processes.

What can be learnt from reviewing these evaluation studies of German PB processes is that the they do not all or at best very little influence political decisions, even if the local council makes a positive decision on specific proposals submitted during a PB process. Moreover, the small number of participants casts doubt on the legitimacy of the proposals. Thus, PB processes in Germany have little real impact on political decisions. Evaluation studies of PB processes in Berlin Lichtenberg, Frankfurt am Main, Berlin-Marzahn-Hellersdorf, Cologne, Mansfeld-Südharz, Oldenburg and Jena report that participants are sceptical as to whether the PB process had any real impact outcome, or else they reported that they felt like that officials do not take the results of the PB process seriously (Schneider/ Busse 2018, p. 8). On the other hand, administrative staff reported that the PB process produces hardly any innovative proposals and that no real discussion about the budget and distribution of resources unfolded. Only in the case of Mansfeld-Südharz (PB process 2012/2013) and Berlin-Marzahn-Hellersdorf (PB process 2015) were proposals rated as good and considered helpful to identify preferences of citizens; in these cases, the quality of the deliberation during the PB process was also perceived as good. This latter was also true for the evaluation of the process in Cologne. Similarly, from the political side, the proposals were evaluated as very concrete and helpful. They gave an orientation for decision making and made day-to-day business easier (Kubicek et al 2011, p. 60)

Thus, even though the political impact is generally perceived as low, the results of different evaluation studies show that participants and city officials report gains in financial knowledge of the municipality and improvement of civic education (Schneider/ Busse 2018, p. 7/8).

Another general result from the evaluation and case studies is that participation rates are rather low and that the residents that participate can be described as the "usual suspects". That means

that a certain stratum of society predominantly takes part in PB processes. These are men between 36 and 50 years of age, that are further characterized by a high level of education and occupational status. Moreover, people that have lived for a comparatively long time in a municipality are more likely to engage in a PB process (Günther 2007, pp. 99-103, Masser et al. 2013, pp. 89-92, Schneider/ Busse 2018, p.11).[22] Thus, spill-over effects on the general population in a municipality and greater socio-political effects as observed in other countries are not expected to occur in Germany. This is also due to the short duration of PB processes in Germany, which hinders the achievement of sustainable effects (Holtkamp/ Bathge 2012, Neunecker 2016).

In a study that stands out for using a large-N quantitative dataset alongside causal analysis, Schneider (2018) analyses which factors influence the participation rates of citizens in PB processes.[23] Firstly, he examines which factors motivate citizens to take part in a PB process from a sociological perspective. He finds that the following three factors are important on the individual level: an internalized norm of participation, membership in an association, and a strong trust in the municipal institutions. Secondly, Schneider analyzes which characteristics at the municipal level explain participation in PB processes. He uses aggregated data to discover potential relationships between the institutional design of a PB process, its local structural and socioeconomic context, the political and financial situation of the municipality and participation rates amongst citizens. The results of his regression analysis show a negative effect of the share of people on welfare on the participation rate and a positive effect of the usage of the internet, as well as huge differences between Eastern and Western Germany, with the participation rate being much higher in Eastern Germany.[24]

PB programs only have far-reaching political and social outcomes in exceptional cases (Neunecker 2016, p.192). Neunecker (2016) conducts a detailed analysis of the impact of PB processes on municipal policies by using data from 13 German municipalities that employed PB processes in 2011. She performs a quantitative evaluation of the 839 top-listed proposals in those PB processes, and of the corresponding formal council decisions by the municipalities in question. She also conducts a standardized written survey of local council members, as well as in-depth guideline-based interviews with parliamentary party leaders and budget experts in five

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[22]See Schneider 2018, p. 100 for a detailed overview of studies analysing participants.
[23] Data include (1) a 2011 survey among 1,233 citizens of the city of Oldenburg, (2) a pooled data set of 185 municipalities with a PB process established between 2006 and 2013, and (3) a multi-level dataset compiled by the Bertelsmann Stiftung comprising 2,698 observations in 27 municipalities in 2013, see Schneider (2018) p.200, p.211, p.223.
[24] Parts of the text in this section have been published in Apostolou/ Eckardt (2022), p. 38.

selected cities. Her empirical analysis reveals that only in rare cases were the submitted proposals actually implemented. The implemented proposals are often measures with low financial volume, or ones that were already on the municipal agenda, i.e., those that would have been implemented sooner or later regardless of the PB process. There are many proposals that the author defines as "unclear", meaning that the administration reviews proposals, but a decision as to whether the proposal will be executed is not given (Neunecker 2016, p.188). Neunecker argues that the low impact of PB on municipal policies follows directly from the complexity of the municipal political process, and from the resulting tendency of municipal decision-makers to follow draft resolutions prepared by the administration. With regard to the type of proposals, an interesting finding of this study is that in municipalities with tight budgets citizens submit more proposals with ideas for saving or generating more revenue. This suggests that citizens are able to take the financial situation of the municipality into consideration and align their proposals according to the financial context (Neunecker, 2016: 181-183).[25]

A 2003 survey conducted among 276 council members that took part in the project *Kommunaler Bürgerhaushalt* shed a positive light on the pilot PB projects. 80 percent of the respondents stated that they gained a better feeling for what is important for citizens, 60 percent stated that PB programs offer a good opportunity to make the budget more transparent, and 55 percent said that they could achieve more acceptance for unpopular budget cuts (Bertelsmann Stiftung/ Ministry of the Interior NW 2004, pp. 32). Thus, PB processes were perceived by the council members as an effective tool to generate fiscal transparency and to prepare citizens for budget cuts in their municipality.

Furthermore, there are studies focusing on the evaluation of online PB processes in Germany. As shown in section 3.2.2, the internet is in important channel to involve citizens in the PB process in Germany. Nitzsche et al. (2012) analyse the degree of web 2.0 implementation in a qualitative multiple case study of 43 online PB processes in Germany. They analysed web 2.0 characteristics such as the integration of citizens into administration processes and communication interfaces. This includes the analysis whether a platform allows citizens to generate user added value and to integrate own ideas. They consider as well whether suggestions for improvement into the online participation platform and thus into the administration's planning are possible and considered. Nitzsche et al. find that web 2.0 implementation is relatively far advanced in some of the online PB processes analysed, but most of the analysed cases do not use the full potential of web 2.0 applications. One common problem is that many of the online processes

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[25] Parts of the text in this section have been published in Apostolou / Eckardt (2022), p. 38.

attract only a small number of users so that network effects are not generated. The authors identify some positive examples of how to generate more users such as the city of Potsdam, which encourages citizens to invite friends using different communication channels to get them involved. However, the authors conclude that not all the possibilities offered by web 2.0 applications are sufficiently utilized. Thus, the process design of online PB processes still has the potential to improve and make them more successful.

Kubicek et al. (2011) evaluate 12 different online-based participation instruments from different countries, including three German online PB processes, on the basis of a secondary evaluation of available reports on 12 successful case studies of consultative citizen participation. The results show that the observed instrument met their goals. They report as core results a better inclusion of the needs and interests of the population, and PB as a tool is seen to promote comprehensibility and acceptance of measures. They list as important features for a successful adoption of online based consultation: a clear objective for the consultation, an issue of high urgency, and the provision of sufficient (financial/personnel) resources.

Scherer and Wimmer (2012) develop a reference process model of how online PB processes can be embedded into the traditional budget planning process. They describe how the different phases of PB in Germany, which are information, consultation and accountability, are implemented within the traditional budgetary cycle using the examples of three German cities, that have adopted PB for several years. They show that the whole process becomes more complex when citizens are involved, which makes the overall process longer. Moreover, PB requires a lot of coordination efforts to deal with the inputs from citizens through different participation channels. Thus, if a PB process is to be adopted, sufficient time for the budgetary process and additional financial and human resources should be provided. Scherer and Wimmer emphasize the important role that third parties, such as PB consulting agencies, play in moderating and accompanying PB processes in Germany.

In summary, studies focusing on effects and process design of German PB mostly rely on case studies or evaluation reports of individual PB programs, and thus results are difficult to generalize. Exceptions are the contributions of Schneider (2018) and Neunecker (2016), who have both conducted broader-based quantitative studies.

Overall, PB processes seem to have either no impact or at most a very small impact on the political outcome in Germany. As a positive effect, it can be noted that PB processes do help to create transparency and to better educate the public about municipal finances, especially in times of fiscal crisis.

3.3.4 Critical Review of PB Processes

While predominantly positive outcomes have been found for the traditional PB cases which followed the Porto Alegre model, positive outcomes from other PB processes located in the global North such as those in the US or Germany have been limited. One point of criticism is that PB programs only have a small impact on the political outcome. In addition, the low participation rates are seen critically. Furthermore, critics argue that the high costs associated with PB procedures are disproportionate to the rather small benefits (Masser et al. 2013, pp. 171-172, Neunecker 2016, p. 242).

During the first pilots of PB in Germany, few citizens actually came to the meetings. For example, in Monheim am Rhein, no more than 20 people attended the information events on the budget. In other municipalities that adopted PB processes, even fewer participants attended the events. This was also the reason for many municipal decision-makers choosing to abandon the PB process after just one round (Masser et al. 2013 p. 171/172, Günther, 2007, p.67).

Larger cities that relied mainly on online procedures have had the experience that few residents engage in the PB process. For example, in Hamburg only around 0.04 percent of the residents entitled to vote participated in the online PB process in 2009. An evaluation of the process shows that another PB process is unlikely to be adopted in light of the low participation rates (TuTech Innovation GmbH 2009, p. 5)

In the city of Freiburg, which used a multi-channel approach in its PB process, participation rates were only slightly higher. At the city conference 0.13 percent of residents that are entitled to vote actually participated, at the internet platform 1.22 percent of residents took part and at the survey 1.68 percent of residents engaged in the process. Therefore, the decision was taken to abandon the process (Schubert 2010, pp. 163-171). Other cities, that used only online processes made similar experiences. Trier, for example, had a participation rate of 2.9 percent of eligible voters in 2011. Solingen engaged around 2.8 percent of eligible voters in 2010, but initially these were only the users who registered on the Solingen participation platform. Only 1 percent of eligible voters submitted proposals themselves. In Cologne, around 1.4 percent of eligible voters registered in 2008 and 2009, with around 10,000 users (Masser et al. 2013).

In the US literature, qualitative studies also show that budget directors argue that participations rates are low due to the complexity of the budget and a general lack of citizen interest (Ebdon 2002). However, Schneider (2018, p.106) points out that even in the best practice example of Porto Alegre at its peak only 1.2 percent of the citizens participated in the PB process.

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Another point of criticism aimed at PB processes is that they merely offer additional opportunities for influence to individuals or influential interest groups who are already active in politics. Studies have shown that men with relatively high educational and income levels are over-represented in PB processes. At the group level, this refers to well-organized interest groups which have enough financial and human resources. PB processes give these segments of society a disproportionate and essentially undemocratic influence on the decision-making processes (Sintomer et al. 2010, p.78, Geißel et al. 2015, p. 160, Holtkamp 2006, p. 199, Neunecker 2016, pp. 242-243). Criticism in other countries has also pointed to the fact that citizens and interest groups that are anyway politically use PB as a forum to push their own interest which might not correspond to the interest of the wider public (Ebdon/ Franklin 2005, Robbins et al. 2008). A further common point of criticism is the cost of the PB process. It is often mentioned that the costs of the programs are not proportionate to the benefits generated by the process, since the number of participants is low. However, the cost of PB programs greatly varies and depends on the implementation process. Numbers that circulate range from basically no additional costs to 1.2 million euros in Frankfurt am Main (Holtkamp/ Bathge 2012, p. 55). Officials from the city of Vlotho, for example, stated that there were no additional costs caused by the adoption of the PB program, since the additional work was shared among the different departments. Other municipalities claim that the implementation and supervision of a PB process requires a full-time job, and that the cost can easily add up to around 50,000 euros.

Material costs for printing brochures etc. are another cost factor. These costs can be reduced by including information about the PB program and budget in the daily newspaper. In the city of Hilden, these costs were only seven cents per citizen (Günther 2007).

Depending on the design of the PB process and any costs associated with external consultation, internet platform and moderation, the overalls cost of the PB processes can take a wide range. This range includes 52,000 euros in the example of Solingen, 60,000 euros in the example of Essen, 80,000 euros in the example of Oldenburg and around 680, 000 euros in the case of Freiburg im Breisgrau (2009/2010) (Eich 2011, p. 53, Servicestelle Kommunen in der Einen Welt 2011, p. 25, Schneider 2018).

Even if a PB process can be realized in a cost-efficient manner, implemented with modern technology and with the Internet as an important channel of participation, additional costs have to be expected. These might be especially difficult to handle in cash-strapped municipalities. As the adoption of a PB program is a voluntary task, there might not be resources available to implement it. Austerity measures were often mentioned, next to the small number of participants, as a reason why a PB process was abandoned (Günther 2007, p. 66-71).

Another point of criticism is that even if proposals are implemented, decision-makers in politics and administration tend to do "cherry picking", which means that they select those proposals that correspond to their own ideas whilst any non-conforming ideas are filtered out (Allegretti 2014, p. 58-59). Thus, citizens do not feel that their proposals have enough weight (Herzberg 2006, pp.100-107, Neunecker 2016, p.244). The consequence of this might be that disillusionment with government is not reduced, but rather is intensified by frustration with the process (Holtkamp/ Bogumil 2007, Wampler 2009, Talpin 2007). The specific type of the saving budget, which evolved and spread in Germany, has been criticized for its potentially demotivating effect on participation. Participants might ask themselves why they should even participate if there is nothing to distribute (Holtkamp 2008).

The reluctance towards PB processes by the municipal council is mentioned as another critical point. Council members might see the process as a threat to their decision power, or they may dislike the measure as a strategic action of the mayor to increase his or her popularity. As a consequence, they may not support a PB processes and even prevent that PB processes from unfolding in such a way as to have real political impact (Holtkamp/ Friedhoff 2014, p. 4). While this hypothesis has not been directly tested empirically, in other areas empirical research has shown that citizen participation is perceived critically by the council whereas the mayor sees it in a positive way (Bogumil/ Holtkamp 2013).

All in all, the aforementioned criticisms of and apparent weaknesses in the PB process lead some academics and municipal practitioners to regard PB as ineffective and to see no future for the program in Germany. Examples from most of the first municipalities that implemented PB in Germany, namely Castrop-Rauxel, Hamm, Monheim am Rhein and Vlotho, indicate that it seems to be difficult to implement a PB process over a longer period of time. Even in cases where a PB process has been implemented over a longer period of time, as in Hilden, only rudiments of the original concept remained after a few years. These procedures only offer citizens very limited influence over the municipal budget (Eisel 2011, Masser et al. 2013, pp. 171-172, Neunecker 2016, p. 283).

3.4 Chapter Summary

All PB processes follow the same basic idea, namely the participation of citizens in the preparation of the budget within the framework of the municipality budgetary process. The idea was born in Porto Alegre during a phase of transformation to a more democratic order.

After that, it was implemented in countries all over the world. While PB has spread at a rapid pace in Brazil and throughout other countries in Latin America, diffusion in other parts of the world happened at slower pace.

When looking at the manner of diffusion in Germany, it is apparent that the number of PB programs has been growing since the adoption of the first PB process. There has been a peak of adoption in 2013. Subsequently the number of PB processes declined, before rising again. There are also large regional differences between the different German *Länder* when it comes to the diffusion. There is an accumulation of PB processes in the *Land* North-Rhine Westphalia while there are only a few cases in the South and the North of Germany.

As PB spread and was adapted to local contexts, its goals and process design also changed. While the goal in many developing countries was to achieve radical change to a more democratic system, in industrialized countries PB is often associated with a modernization of the administration towards greater citizen orientation. An analysis of the background of PB adoption in Germany shows that adoption of PB processes was linked to extensive reform in the public sector in the 1990s. Thus, with regard to the typology of PB processes presented in this chapter, German PB processes can be assigned to the "participatory modernization" model. An important goal of that type of process is the creation of more transparency. These processes are merely consultative in Germany, as the decision-making competence stays with the city council. In terms of the process design, a three-stage procedure has evolved, comprising the stages of information, consultation and accountability.

Considering the content of PB processes, many of the cases are either *savings-based*, giving participants the opportunity to hand in saving proposals or to make suggestions how to improve municipal revenues. More and more municipalities rely on the internet as the primary participation channel. This is partly due to larger cities tending to adopt PB, so that internet becomes the easier way to engage citizens. It also fosters the consultative character of PB processes in Germany, as deliberation quality is low.

Thus, a conclusion from this chapter is that the focus of PB in Germany is to make the financial situation of the municipality more transparent. This applies especially to municipalities that are in a budgetary crisis. PB seems to be an instrument that policymakers use to prepare citizens

for budget cuts. A special form of PB in Germany has even evolved, in which citizens can suggest where to save public resources in order to establish a balanced budget. Goals of such PB processes are to build trust and gain higher acceptance of political decisions, especially in times of financial distress. As citizens are directly affected by cuts, closures and levy increases in those times, it is even more important to involve citizens in these decisions.

Section 3.3 presented a literature review of adoption, effects and critical assessment of PB. With regard to the adoption of PB processes, most studies are descriptive. Most of the literature studies employ qualitative methods to test theories around the diffusion of PB across local governments within a country, within Latin America, or globally.

There are a few contributions that use logistic regression analysis to estimate the probability that a municipality adopts PB based on electoral, economic, regional, and policy network variables (Wampler 2007, Spada 2014, Baiocchi 2005).

Extensive research has been conducted from a political science perspective with a focus on analysis of the democratic outcomes of PB. These studies focus on evaluating and analyzing how PB processes change the political process, whether citizens are empowered, and whether social injustice is reduced. Most studies consist of qualitative individual case studies, which often focus on Latin American countries. There are some examples of comparative studies that study different cases in one country or that compare PB processes in different countries.

Results with regard to the effects of PB programs vary from country to country. For countries in Latin America, many of the positive effects such as empowerment of citizens, redistribution of resources and the improvement of living conditions for poorer part of society have been confirmed. This demonstrates that PB programs have enormous potential to lead to more democratic structures and to improve living conditions. Studies show that PB processes are more successful when they are equipped with enough resources and when the local level has sufficient autonomy over local finances. In Germany, the local level has a relatively low degree of autonomy, and this degree is reducing further over time. Thus, it is questionable whether PB processes can have a real impact on municipal finances in Germany. Effects have been found to be stronger if PB processes have been implemented for a long period of time. In Germany, most programs only last for one or two years. Literature also identifies a committed mayor as key factor for a successful PB program. The institutional design in Germany does not build incentives for mayors to adopt such a program (this will be further discussed in the next chapter). In addition, decision-makers in Germany have been found to prefer to only adopt proposals that keep the status quo (Neunecker 2016).

The literature of PB in Germany consists largely of single case studies evaluating PB processes in individual municipalities or cities. These studies rely mostly on qualitative research methods like expert interviews, surveys and the examination of documents related to the process. While these studies give in-depth analysis of single processes and allow best practice cases to be identified, they provide few general conclusions for the design, adoption or impact of PB processes. There are no in-depth studies using quantitative data methods that focus on the policy effects of PB in Germany and the factors that influence participation in PB processes.

Despite the growing attention given to PB in the scholarly literature reviewed, there are some gaps in the literature especially from an economic point of view.

For one, the impact of PB on municipal budgetary policy, on the composition of the budget and on fiscal indicators such as the budget deficit has not yet been adequately researched. Furthermore, to date there are no studies that systematically examine which factors cause municipalities to adopt PB processes (Schneider 2018, p. 98). This thesis aims to contribute to filling this research gap. Therefore, the next chapter reviews the relevant literature to explain PB adoption from an economic point of view.

4 Theoretical Framework and Hypotheses – Examination of Factors Explaining PB Adoption and Diffusion

In this chapter, factors that motivate the adoption and diffusion of PB are identified by applying economic theories. The motivation to adopt a PB process in Germany is explained using public administration literature, fiscal federalism and public choice theories. Furthermore, the factors found in the policy diffusion literature to motivate adoption of political innovations in general, and PB processes in particular, are reviewed. Based on these theoretical concepts, research hypotheses are formulated. The chapter is structured as follows. Sections 4.1.to 4.4. discuss findings from the Public Administration literature, Fiscal Federalism theory, Public Choice theory and the diffusion of policy innovations literature with regards to PB adoption. Section 4.5 presents hypotheses with regard to PB adoption based on these literature findings and theories. The chapter closes with a summary in 4.6.

4.1 Explanatory Factors based on Public Administration Research

This section summarizes contributions from Public Administration research that analyse how citizens can be involved in budgetary decisions. Citizen participation in the budgetary process is not necessarily labelled explicitly as PB in these cases, and processes analysed here do not necessarily hold all the features common to the original Latin American cases. Furthermore, as proponents of PB do so for different reasons, there are many "divergent local interpretations of what PB can be" (Wampler 2012, p.3, see above section 3.1.1). The main goal of US PB processes is not to improve deliberation quality; instead, they serve more as technical solutions for citizen participation in the budgetary process to make it more transparent or more efficient. Thus, these US cases are more akin to the German ones. They also share the feature that the decisions made in such a participation process are not legally binding; instead they have merely consultative character (Callahan 2002, Ebdon 2002, Orosz 2002).

According to Ebdon and Franklin (2006, p. 438), these studies focus on the following four topics:

"(a) the goals or outcomes sought;

(b) overall process designs for involving citizens in public resource allocation;

(c) the specific mechanisms by which citizen participation is elicited;

(d) the institutional, social, and economic environments within which efforts do or do not take place."

Goals that are frequently mentioned in the US literature include the reduction of cynicism, the education of participants about the budget, to gain support for budgetary decisions, to collect input from the citizens for budgetary decisions, to make public resource allocation more efficient and to improve trust between the voters and decision-makers (Wang 2001, Ebdon 2002, Ebdon/ Franklin 2006, p.438, Innes/ Booher 2004, Wang/ Van Wart 2007). Literature has confirmed these positive effects. Based on a national survey of city managers and chief administrative officers, Berman (1997) finds that cities with more participation are less cynical about local governments. Both participants and public officials confirm that PB can help individuals to gain expertise in a given area (Thomas 1995, Watson et al.1991, Kweit/ Kweit 1987).

Watson, Juster and Johnson (1991) evaluate a case study about the adoption of citizen surveys in the city of Auburn in the state of Alabama. They conclude that an institutionalized citizen survey as a form of citizen engagement in the budgetary process "provide a productive mechanism to incorporate citizen participation efficiently and productively into local government processes", based on a case study in Auburn.

Contrary to these findings, Wang (2001) does not find a significant relationship between PB processes and an improvement in public trust, comparing Kendall rank correlation coefficients of 249 US municipalities. He finds no significant correlation between participation and a government's capacities in taxation, debt, and budget appropriations. He also finds that public participation does not leave citizens willing to pay more for public services. Therefore, he concludes that governments should not expect a better fiscal situation as a result of citizen participation in the budgetary process.

Ebdon (2002) adds to the literature with a cross-case comparative study based on interview results with budget directors in 28 US cities. Her most important results with regard to the effects of citizen's participation in the budget are that most budget directors assume that the input stemming from citizen with regard to the budget has an impact on the decision made by the elected officials. Franklin and Ebdon (2005) get similar opinions based on 40 interviews with elected officials, city administrators, and active citizens in two US cities. Though, they do not find that citizen engagement has a direct influence on decision making. It neither supports to sort priorities in local government budgeting. They conclude that the most important positive result of citizen input instruments are the education about resource limitations and in communicating spending preferences. Ebdon (2002) finds that participation helps to educate citizens about budget complexities and to market the proposed budget.

Simonsen and Robbins (2000) evaluate a budget participation project that took place in Eugene, Oregon to assess preferences of residents when the city faces fiscal stress. They find that citizens who know about the taxing practises are more likely to be in conflict with the service than others. Thus, they conclude that the provision of fiscal information affects citizens' preferences for taxing and services.

With regard to process design of participation processes in PB, studies show that participation is the most effective when it happens at an early stage in the budgetary process and budgetary decisions can actually be influenced. Moreover, PB processes have a more positive effect when a two-way deliberative communication is used, as opposed to one-way information sharing (Kathlene/ Martin 1991; King, Feltey/ Susel 1998). Franklin and Ebdon (2005) conduct an empirical study using case study material (more than 80 interviews of elected officials, city administrators, and citizen participants, surveys, documents, publications, media outlets; videos, and nonparticipant observation) from two US cities in 1999 and 2000 that have been identified as the most active and innovative of 28 Midwestern cities (Ebdon 2002). Based on these, they analyse causes and effects of different factors and how effective the outcome of a PB process is. They measure the outcome by checking, whether feedback is given on how the citizen input is dealt with, whether the participants are satisfied with the process, and whether the participants feel like they have affected budgetary decision-making. As factors that influence the outcome, they include variables measuring the structure, participants, process, and mechanisms of the participation. Their study confirms, that larger cities have a larger probability to engage citizen in the budgetary process than comparatively smaller cities. Furthermore, they find that citizen participation is more efficient if it the process is legally embedded. Moreover, the quality of the process gets better if the citizens are encouraged directly by the council or city manager to take part in the process. In addition, if citizens see participation as their civic duty, the outcome of the process is found to be more effective. With regard to how the process itself is organized, better results are noticed when there are different opportunities to take part in the process and if these opportunities are organized early in the whole budgetary process. Furthermore, it is important to sufficiently inform the participants about the municipal finances.

However, results in the literature are inconclusive on the question of how the institutional setting influences the adoption of participatory elements. Based on a survey in four US cities,

Kweit and Kweit (1981) find that cities that have a council-manager are more likely to participate citizens in the budgetary process. [26] Nalbandian (1991) suggests as well that cities with a council-manager form of government are more prone to engage citizens in the participatory process. Ebdon (2002) and Franklin and Ebdon (2005) find as well that cities with council-managers rather use formal budget-participation methods. However, these finding are based on qualitative data and are thus difficult to generalize.

The results of Wang (2001) contradict these findings. He employs the Kendall rank correlation coefficient in 249 US municipalities using data from a national survey. Based on these data, he does not find significant differences between the government form and citizens participation in budgetary decision. On the other hand, his statistical analysis confirms that the size of government and political divisiveness may be a reason for public participation in the budgetary process. The size of government, measured by the number of full-time employees, positively influences the adoption of a PB process. Other studies confirm that participation in the budgetary process is more prominent in larger cities (O'Toole et al 1996, Ebdon 2002, Franklin/ Ebdon 2005). A theoretical explanation for this observation is that larger cities are more heterogeneous, leading to increased desire on the part of citizens for access to decision-makers (Protasel 1988, Nalbandian 1991).

Zhang and Yang (2009) analyse the relationship between institutional design and citizen participation in the budget in more detail using a large-*N* survey data covering 276 cities in Florida. They analyse how "managers' professionalism", "perceived political environment", and "attitude toward citizen input" influence local governments' decision to employ PB. Their logistic regression results show a positive relationship between the variable "managers' professionalism", which is measured by whether the manager holds a MPA degree[27], and the motivation of the manager to make use of instrument that further citizens participation. Furthermore, professional networking positively influences the probability that citizens can participate in the budget process. They also find that a city manager with greater institutional power has less motivation to engage citizens in the budgetary process. Furthermore, the regression shows that PB adoption is more likely if the political environment is considered to be stable. The authors suggest as a reason for this finding that in such an environment it is less risky to engage citizens, since their preferences are likely to be more stable and predictable.

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[26] The council-manager type of government is one of the typical forms of local governments in the US, the other is the mayor-council government form. Under this form, an elected governing body, usually city council, appoints a professional manager to oversee the administrative operations, implement its policies, and advise it (NLC n.d.)

[27] The Master of Public Administration (M.P.Adm., M.P.A., or MPA) is a professional graduate degree in public administration, similar to the Master of Business Administration but with an emphasis on the issues of public services in the U.S. (NASPAA n.d.).

To sum up, contributions from Public Administration literature on the topic of citizens´ partic-ipation in the budgetary process mention the following factors as influencing the likelihood of PB adoption: the structure and form of government, population size and diversity of population as well as the political environment. These factors will be taken into consideration when for-mulating research hypotheses for PB adoption in Germany.

4.2 Explanatory Factors based on Fiscal Federalism Theories

Within the theory of fiscal federalism there exist diverging approaches to defining the appro-priate level of decentralization as well as to defining the tasks assigned to different levels of government. In this section, these approaches are applied in turn, to analyse which benefits PB processes could bring as a form of decentralized institution. It thus addresses the central ques-tion of this dissertation, which asks why PB processes are adopted from an economic perspec-tive.

When deciding on the appropriate public organisational structure of fiscal federalism, the ori-entation towards the preferences of the citizens plays a major role. Therefore, the main question to answer is: what is the optimal size of jurisdiction to fulfil the preferences of the public in the best possible way? The main argument in favour of a federal government structure is that in a state with only one central level of government an unnecessarily large number of citizens would be outvoted, i.e., their preferences would not be taken properly into account. As a result, citizens would get increasingly "frustrated" with being outvoted. This would result in high "frustration costs" for the state which ultimately have to be addressed (Zimmermann et al. 2019, p.14). As this argument implies a preference for a state structure with multiple government levels, the next questions relate to how many governmental levels are optimal and how competencies and public tasks should be divided between them. The first step in considering the design of differ-ent government levels is the observation that there are different sizes for different public goods and for regionally defined user groups with heterogeneous preferences. User groups are for example smaller for some public goods like kindergartens and larger for a public good like defence. That justifies the existence of different governmental levels.

Based on these considerations, Oates developed the *decentralization theorem*. The theorem's main suggestion is that for publicly provided goods that can be categorized as rival private goods and whose production is characterized by the same average production costs independent of the level of provision, the provision by lower levels of government is superior to the provi-sion by a single government or by higher regional authorities (Oates 1972, p.35). If preferences

are not homogenous it is better to have more jurisdictions of different sizes than just one large one. Otherwise, all households in one jurisdiction are forced to consume the same level of the public good or service. Thus, if a population is characterised by diverging preferences, a division into smaller jurisdictions will lead to better fulfilling the different preferences among the population. When population groups are smaller, the preferences of any household, that is selected by chance, will be closer to the preferences of the median household in the group. Decentralisation can thus lead to an improvement of economic welfare. It leads to a provision of public goods and services that is closer to the optimum for each individual household for each group.

Another theorem about the optimal size of jurisdictions for the production and allocation of public goods is the *club theorem*. This theorem describes how to deal with public goods which can be subject to crowding or congestion, but which are also characterized by economies of scale. In that case, two factors have to be considered when deciding about the optimal size of jurisdiction. On the one hand, relatively large sizes of jurisdictions will reduce the costs of the provision of the public good due to the economies of scale. On the other hand, the efficiency of the provision of a club good can decrease if more citizens use it as for example in the case of traffic congestions on popular roads. According to the club theorem, the appropriate size for jurisdictions for club goods is one in which the marginal costs from additional congestion are offset by the marginal benefits from lowering the average costs of the public good (Buchanan 1962).

The *externality theorem* implies that centralisation can be justified in the case of external effects (Pigou 1932). There are many circumstances in which the activities of lower-level governments provide spill over of benefits to other areas. These interregional externalities can be positive, such as in the provision of museums or theatres that attract visitors from other jurisdictions, or negative, as in the case of environmental pollution. If these externalities are not internalised, too little of these activities may be undertaken by lower levels of governments, as third parties can use the public good without paying for it. An appropriately designed matching grant can reduce the cost of public service provision for lower levels of government, thereby stimulating the provision of the respective public good or service and, if the matching level is chosen appropriately, internalizing the externality.

Coase (1960) argues that a solid financial architecture requires *institutional congruence*. The competencies and responsibility for taxation, expenditures and debt must, as a consequence, be altogether decentralized or centralized. If fiscal decentralization or centralization is incoherent, political decision-makers and citizens will have incentives to keep increasing spending and

shifting costs to other levels of government. Institutional congruence is a prerequisite to ensuring the "principle of fiscal equivalence". The concept of fiscal equivalence, coined by Olson in 1969, implies that there is "a match between those who receive [have access to] the benefits of a collective good and those who pay for it" (Olson, 1969, p. 483). Rather than referring to individual or group benefits and costs, the principle introduces a territorial understanding of public service delivery and financing. Both services and payment schemes should be located at the lowest possible level that allows for the internalization of costs and benefits. If the principle of fiscal equivalence is violated, spill-over effects are generated that lead to an inefficient supply of public goods. This principle allows the price function of taxes to work. If additional public tasks or services are provided and public expenditure rises, taxes also must be increased, or vice versa.

Tiebout (1956) provides a positive theory of fiscal federalism based on an analysis of municipalities in the US. He claims that market principles can be applied to explain the existence of jurisdictions of different size. They are competing on the different markets for public goods and services needed by the citizens. The model assumes, that there are there are many consumers and many suppliers at the municipal level and low costs to switch, which are the basic assumptions for a market with perfect competition. In his model, Tiebout assumes that households "vote with their feet" to equilibrate public goods markets. He assumes that "spatial mobility provides the local public goods counterpart to the private market's shopping trip" (Tiebout 1956, p. 422). Tiebout uses quite restrictive assumptions in his original model. He assumes that the considered inhabitants have no employment interest; they live, for example, on pension income and that they do not incur any mobility costs when they move. The decision to move to a new place of residence is based only on the public services offered by the municipality, compared with the share of financing that must be provided, meaning the taxes they are obliged pay. Furthermore, it is assumed that inhabitants have full information about these offers. Municipalities in that model offer a specific bundle of public services with corresponding taxation that are limited to the inhabitants of the respective municipality. Thus, municipalities compete in attracting inhabitants. The citizens move to the municipality that best suits their preferences. A municipality that then offers the comparable bundle of goods at a higher price than others loses its inhabitants. On the other hand, a municipality attracts inhabitants if it can reduce the cost of services. This original model of Tiebout was intended to create an analogy to the market for consumer goods, whereby consumers with full information about prices and quality differences and faced with different providers of the product will make decisions so as to receive the best possible deal for themselves. In that case, municipalities have to offer taxes and benefits

that are competitive and appealing to potential inhabitants and businesses. That will lead to an efficient provision of public goods and speaks in favour of the provision and financing of public services on the local level. Higher government levels produce public goods that require a larger optimal operational size and thus serve several municipalities.

On basis of that theory, Feld (2000) defines different channels that lead to economic growth because of decentralisation. One channel is that regional policy measures are designed for the needs of is regional businesses and thus support them growing. He also points out the importance of the political innovation channel. Since on the decentralized level there are numerous jurisdictions, different types of political innovations can be experimented with and examples of best practice can be identified.

These theories give a clear indication of which public tasks and services should be provided on lower government levels, and in which cases higher government levels should provide a certain public good. The introduction of PB at municipal level can be seen a measure of decentralisation. According to the *decentralisation theorem* this leads to a better fulfilment of citizen´s preferences. As PB is a process that directly involves citizens and offers them a platform to express their preferences, economic welfare could be improved by the adoption of PB processes.

The *club theorem* offers reasons in favour of PB adoption as well. It would give citizens a platform to reveal their marginal benefits, which could then be compared to marginal costs, potentially leading to improved economic welfare.

According to the *externality theorem*, public services that have externalities should be taken care of by higher government levels. The adoption of a PB process will usually not interfere with that as "smaller" matters are discussed in PB processes and not matters of larger extent such as pollution abatement activities.

Looking at *institutional congruence* and the *principle of fiscal equivalence*, PB processes have the highest potential to lead to an improvement in economic welfare. As public finances are at the heart of PB processes and these processes bring together local politicians, administrators and citizens, PB is a process that can lead to improved fiscal equivalence. However, the potential of PB processes has limitations due to a violation of the principle of institutional congruence when considering the fiscal organisation between the different levels of government in Germany. Chapter 2 outlined the ways in which financial relations are intertwined. Taxes are collected locally, then they are transferred totally or partially to the federal and *Länder* level and

from there are given back as fiscal grants to the *Länder* and from the *Länder* to the local authorities. It is difficult to identify which jurisdiction or group of people eventually benefits from this tax income and grants. Hence, for PB processes to impart their positive effect on fiscal equivalency, regulations for clarification and for creating institutional congruence would be necessary.

Looking at the *Tiebout model*, PB processes can be a medium to match supply and demand of public goods. PB processes are designed to offer a platform on which citizens can express their preferences regarding local goods´ provision. Thus, they could be a tool to make the provision of public goods more efficient.

Applying different theories from fiscal federalisms theory to PB adoption, it can be concluded that PB processes would benefit citizens. They could contribute to improving economic welfare as a whole. Therefore, it can be said that from a citizen's and economic point of view, the adoption of PB would be desirable.

4.3 Explanatory Factors based on Public Choice Theory

While fiscal federalism theory offers a justification for the adoption of PB from the point of view of citizens or of the "economy as a whole", it cannot explain why local politicians might adopt PB. To the contrary, they might not be motivated to adopt and shed light on public finances because they do not have to account to the citizen of the municipality for the expenditure financed by allocation of higher government levels. Then the question remains why politicians in municipalities that face fiscal difficulties would rather adopt a PB process, as is observed in the case of German PB processes (see chapter 3). This section seeks to answer this question by applying basic principles of public choice theory, as well as findings from empirical research on the relationship between political interests and public finance, especially regarding public debt.

Contrary to the common notion in political sciences that politicians act in the public interest, the public choice theory considers politicians as self-interested actors that do not always act in the interest of the common good, but instead pursue self-serving goals. The main goal of politicians according to this theory is to secure their re-election and to maximize their self-interest (Arrow 1951, Black 1958, Buchanan/ Tullock 1962, Olson 1965).

The theory of vote-maximising developed by Downs (1957/1968) assumes that politicians use public service for re-election purposes rather than for economic purposes. According to this theory, parties and politicians primarily seek to take over government business in order to gain

income, power and prestige in the exercise of their office. For this they must win a sufficient number of votes. An important instrument in this respect is the use of public finances. Transferred to budgetary policy, Downs defined the policy of vote maximisation as follows: "Expenditure is increased until the gain in votes achieved by the last monetary unit spent is equal to the loss of votes caused by the last monetary unit withdrawn from government financial sources" (Downs 1968, p. 50). This will lead to an expansion of the overall budget.

Rogoff (1990, p. 30) develops a model of rational political budget cycles that has the assumption that "the prospect of being able to run for re-election again in the future raises the temptation to distort fiscal policy, and thus tends to exacerbate the political budget cycle." Thus, in the Public Choice Theory, politicians have incentives to use fiscal politics in a way that increases their chances of being re-elected.

From this, Buchanan and Wagner (2000) derive implications for public finances. They argue that the abandonment of the balanced-budget constriction, which used to be part of the Keynesian policies, and opportune politicians will lead to higher budget deficits, monetary expansion, and the growth of the public sector. As in a democratic system the number of votes received in an election decide who will be in power, politicians are in competition for voters. Thus, they are inclined to promise policies and programs which they hope will get them elected or re-elected. Buchanan and Wagner derive from that, that politicians have strong incentives for spending and for avoiding taxing voters. This can lead to an accumulation of public debt that is totally independent of the business cycle. There is a high probability that politicians increase spending more than revenue, and thus create budget deficits. The problem is that, contrary to the Keynesian theory, politicians do not reduce those deficits in an economic upswing phase. This leads to the accumulation of long-term debt. Therefore, Buchanan and Wagner conclude that the fiscal policy recommendations developed by Keynes do not function in the curerent system of democratic politics (Buchanan/Wagner 2000, p. 96).

For the case of political business cycles, a pioneering paper by Nordhaus (1975) shows empirically that debt is increased in pre-election periods, and these additional funds are then invested mainly in such projects which promise a high additional gain in votes. Nordhaus concluded that the fluctuations in the economy therefore follow the election cycles and are even caused by these. Nordhaus's model explains that accumulation of debt follows the business cycle only at the national level as only at the national level are there fiscal and monetary instruments that can influence the business cycle.

However, local policymakers are also evaluated by the electorate based on observable measures such as the amount of taxes or provision of certain public goods. Therefore, local politicians have an incentive to use public debt to increase their chances of being elected or re-elected. There is empirical evidence that local decision-makers use debt strategically.

Foremny and Riedel (2012) study the relation of business taxation to elections on the municipal level. They perform difference-in-difference regression analysis on 8,000 German municipalities between 2000 and 2008. They find a significant effect of upcoming elections on the taxation behaviour of local politicians. They measure that the local business tax rate drops by 40 percent in an election year and surges around the same rate again in the year after the election. They can distinguish the effects of election from other economic trends as the election dates vary across local councils. Therefore, the analysis gives strong evidence that the variation in the business tax rates is independent of business cycles and suggest a political cycle in taxation at the local level.

Klein and Sakurai (2015) analyse the relationship between elections and fiscal strategies in Brazilian municipalities. They use a method called system-GMM estimation method with a dataset comprising 3,393 Brazilian municipalities in the period 2001 and 2008. Their findings show that mayors reduce local tax revenues before elections. Due to the strict restrictions on fiscal policy in Brazil, they do so without producing budget deficits.[28] Instead they change budget composition toward types of spending that are more visible and popular with voters. The results confirm the existence of political cycles when it comes to the variables "local tax revenues", "current expenditures" and "capital investments" in Brazilian municipalities. However, due to the strict rules on fiscal balance, the budget balance and debt levels are not affected by the political cycle. This shows that the change of incentives creates a change in politician's behaviour with regard to fiscal policy.

Garcia-Sanchez et al. (2011) analyse the presence of political cycles at the municipal level in Spain. They use the GMM estimator of Arellano and Bond (1991), performing a regression analysis based on a sample comprising 148 Spanish towns (population exceeding 50,000 inhabitants) for the period 1988 to 2008. Their results show that politicians behave opportunistically in election year which leads to significant increase in public debt in relation to municipal revenue, even though the Budgetary Stability Law effective since 2000 legally caps public debt.

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[28] In 2000, the Law of Fiscal Responsibility was introduced in Brazil. This law contains fiscal adjustment plans that strictly forbid new deficits and public debt. It also aims at making fiscal decisions more transparent and to provide voters with improved access to governments' budgets and the ability to assess the governments´ fiscal performance (Klein/ Sakurai 2015).

These empirical findings suggest that the fiscal behaviour of local politicians can be explained by public choice motives. More precisely, politicians use fiscal policy to improve their re-election chances rather than to improve the economic situation, at the municipal as well as other levels of government.

The *Weak Government Hypothesis* offers another explanation from public choice theory for the occurrence of public debt for political reasons. This hypothesis argues that government fragmentation in representative democracies can cause higher public debt due to common pool problems and the strategic use of debt (Roubini/ Sachs 1989a, 1989b). In these scenarios, individual politicians have the incentive is to oversupply their target groups with public goods and service to increase their chance of being re-elected using the common pool of revenues (Weingast/ Shepsle/ Johnson 1981). The higher the number of parties in a coalition, the larger is the problem as the share of the costs for each group decreases, with an increase in the number of groups (Olson 1982, 1993). Log-rolling, where there is trading of votes by representatives in the legislature to obtain a majority within political bodies for certain projects, can cause an undesired increase of public debt. Since this principle works only when it is reciprocal, more projects are approved than desired by voters. As a result, expenditures rise to a level that exceeds the level favored by voters. Empirical research confirms as well that in multi-party coalitions the increase in public debt is larger the more polarized the coalition partners are (Weingast/ Shepsle/ Johnsen 1981, Weingast / Marshall 1988).

These arguments were confirmed in several studies. Results from an empirical analysis of 26 Swiss cantons between 1980 and 1998 indicate that the larger a cabinet is the worse is the fiscal discipline of that government (Schaltegger/ Feld 2004). Geys and Heyndels (2005) analyse the weak government hypothesis using a panel dataset with 298 Flemish municipalities in the period between 1977 and 2000. They cannot confirm that relatively weaker governments produce more public debt in the long-term. However, they find that larger coalition leads to surges in the short-term debt levels of municipalities.

Rattsø and Tovmo (2002) analyse the effect of political strength, defined as the degree of party fragmentation of the local council, for 275 Danish municipalities in the period from 1983 to1996. The find that governments that can be described as political strong tend to imply lower property taxes. On the other hand, governments that are characterized by a higher degree of political fragmentation lead to higher social expenditures. According to their study, socialist governments have higher levels of public spending and are responsible for larger budget deficits. Revenues are not affected by ideology.

Ashworth et al. (2005) analyse the relationship between government fragmentation and municipal debt in 298 Flemish municipalities from 1977 to 2000. They find that the larger the number of parties in a coalition, the higher is the municipal short-term debt level. Furthermore, the study reveals find that municipal debt levels increase before an election. Additionally, Ashworth et al. find that budget deficits exist longer if the government is more fragmented. Correspondingly, Geys (2007) reports that increases in Flemish municipal debt around election time over the period 1977 to 2000 are related to "political fragmentation".

An analysis of ten Western German *Länder* for the period 1960 to 2005 finds evidence for the weak government hypothesis. Coalition governments produce significantly more debt than single party governments (Jochimsen/ Nuscheler 2011).

Fossen (2014) investigates how the extent of public debt within a municipality influences other municipalities in the same *Land*, using a panel dataset including municipalities in the two largest German *Länder* - Bavaria and North Rhine-Westphalia- for the period from 1999 to 2006. The analysis shows that a municipality rises its per capita debt by 16 euros in North Rhine-Westphalia and even by 33 euros in Bavaria if neighbouring municipalities increase their debt by 100 euros. The authors conclude that the possibility to increase debt offers German municipalities to undercut their neighbours' current tax rates and thus gain a comparative advantage with regard to attracting businesses. By increasing municipal debt levels, they do not have to cut expenditures.

Chatterjee et al. (2018) applies an artificial neural network (ANN) forecasting model based on a sample of all New Zealand local governments for the financial years 2006 to 2014 to test predictions of local governments´ debt level and "political competition" which they measure as "number of candidates" compared to "positions available." Their results confirm that a higher degree of political competition leads to higher debt levels.

Besides government fragmentation, there are incentives to directly use *debt as a strategic instrument* to actively limit the next government in their scope of action.

Person and Svensson (1989) propose a theoretical model in which they argue that if a conservative government expects to lose an election to a left-wing government, it borrows more than it would have if it expected to remain in power. The authors assume that the conservative government is acting in this way to limit the successor government's ability to take political actions. Alesina and Tabellini (1990) develop a theoretical model that claims that both left-wing and right-wing governments will issue more debt when it is clear that they are not re-elected.

Pettersson-Lidbom (2001) tests these models using OLS regression with a panel data set from 277 Swedish local governments in the period 1974 to 1997. The author (2001) reports that

parties from the right and the left political spectrum issue more debt if a defeat in upcoming elections is likely.

In summary, Public Choice theories suggest that political representatives act according to their own benefit and use public finance to increase their probability of re-election. This is widely confirmed by empirical studies analysing these effects. Thus, PB as an instrument that affects public finance might be used by politicians to influence their (re)-election chances. More especially, politicians in financially strapped municipalities have an incentive to adopt PB in order to gain popularity amongst the electorate.

4.4 Explanatory Factors based on Diffusion Theory of Innovation

There is a broad literature on the diffusion of policy innovations. In this section the relevant empirical studies are presented with the aim of identifying determinants of policy diffusion that can be applied to the adoption of PB in Germany.[29]

A widely accepted definition of policy innovation, which is applied in the following, was formulated by Walker (1969). He defines political innovations as "an innovation as a program or policy which is new to the states adopting it, no matter how old the program may be or how many other states may have adopted it". Diffusion is described as "the uncoordinated but interconnected adoption of similar programs by governments" (Wampler, 2008, p.6); or "Policy diffusion can be described by a logistic growth curve, or an S-shaped curve. Policy adoption is slow at first, then very rapid, then slow again as the saturation point is reached" (Baumgartner/ Bryan, 1993, p. 17).

In the diffusion debate, there are two main streams trying to explain the diffusion of policy innovations. Following Walker (1969), one stream concentrates on the diffusion of innovations across states. According to *regional diffusion models*, the probability to implement a specific policy is larger if this specific policy is already in place in neighboring jurisdictions. Following Dye (1966), another approach focuses on *internal state determinants of policy innovations.* According to that approach social, economic, political and other characteristics of a jurisdiction influences how innovative it is. These two groups of determinants were used analyzed separately in the early literature separately. Later literature focused on explaining diffusion using both groups of determinants.

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[29] A similar version was published in Apostolou 2016.

Walker's study (1969) has had a significant effect on further studies of the policy diffusion by highlighting the regional dimension of adoption patterns. He focuses on finding answers to the question of why some states appear as pioneers by adopting new politics and programs quicker than others, and how these innovations spread amongst the American states. A correlation analysis reveals that larger, wealthier states implement new politics more rapidly than smaller, less well-developed neighboring states. Walker (1969, p. 886) argues that this is due to larger states having "free floating" resources in the form of money or highly skilled staff. Accordingly, politicians can more easily experiment with new policies. A factor analysis and a cluster analysis furthermore yield the result that these states function as regional pace-setters which a group of followers.

Berry and Berry (1990) were the first to estimate a combined model of internal state characteristics and geographical effects. In their study of the pattern of state lottery adoption in the U.S., they find that internal as well as regional factors have an impact on the decision to adopt policy innovations. Thereafter, several studies have been published that base their empirical investigation of policy innovation diffusion on both internal state characteristics and on regional effects. These combined models also found strong evidence for the positive influence of geographically close states regional effects. Berry and Berry (1990, p. 403) consider the details of how a particular policy works in a neighboring state as a resource for overcoming the obstacle of uncertainty about the way a policy innovation works. They argue that if a specific policy is popular with the electorate, nearby states that adopt that policy will put pressure in the politicians in other states to adopt it as well as voters become aware of new policies in nearby states and are also interested in having these policies, if they are popular.

Besides geographical proximity, other factors have been found to influence the diffusion of policy innovations: the presence of sufficient resources (Berry/ Berry 1990), strength of the interest groups opposing the reform (Berry/Berry, 1990), resources for overcoming obstacles, ideology of the state government and political cycles (Gray 1973, Sapat 2004, Volden 2006, Wampler 2008, Spada 2010), the presence of political advocates (Mintrom 1997), problem severity (Nice 1994, Sapat 2004), institutional factors (Sapat 2004), success of the policy innovation (Volden 2006) and political competition (Spada 2010).

How these factors are operationalized in an empirical analysis depend on the specific political innovation considered. In the case of lottery adoption, Berry and Berry (1990) find that short-term fiscal health measured by the ratio of total-state-revenue-minus-total-state-spending to total spending plays a role. States in bad financial health have higher probabilities to adopt an innovation such as a lottery to increase state revenues. Furthermore, their study reveals that a

lottery is more likely to be introduced in an election year. Concerning obstacles of adoption, Berry and Berry find that the existence of fundamentalist religious groups reduces the likelihood of lottery adoption. Furthermore, low income levels in a state decreases the probability that the lottery is introduced in that state.

Mintrom (1997) studies the diffusion of school choice programs in the 48 continental American States in the period 1987 to 1992 as a political innovation. His focus is on analyzing how political entrepreneurs influence the adoption of new policies. Mintrom (1997, p.738) assumes that "policy entrepreneurs constitute an identifiable class of political actors", and describes them as decision-makers who see themselves as innovators. They actively promote changes of policy "by networking in policy circles, by shaping the terms of policy debates, and by building coalitions" (Mintrom1997, p.738). Results show that the existence of political entrepreneurs positively influences the likelihood to adopt school choice programs. Unlike in the case of lottery adoption, Mintrom argues that the approval of school choice is more likely in years that are not election years because school choice can lead to political debates. Therefore, risk-averse politicians tend to avoid legislation, that can be seen as controversial, in an election year. Mintrom investigates not only the diffusion of actual adoption but also which factors lead a state to consider school choice programs. The most important difference between the explanatory factors for school choice program consideration and approval seems to be that legislators will be more supportive of school choice programs if there is evidence of problems with the current system, whereas school choice consideration is more influenced by whether neighboring states adopted it and by the electoral cycle.

Sapat (2004) investigates which continental American States adopt environmental policy innovations in the area of hazardous waste regulation in the period from 1986 to1995. She assumes that the severity of the problem plays an important role. She measures the severity of the problem using the "total number of hazardous waste sites in a state". The empirical analysis confirms that there is a positive relationship between the number of hazardous waste sites and the adoption of hazardous waste regulation. She also tests the effect of the policy-maker and administrator motivation to adopt such programs, by including the number of full-time equivalent staff in state hazardous waste clean-up programs as an explanatory variable. The larger that number, the more likely a state is to adopt. To detect the influence of institutional factors, she includes a variable that captures "state commitment to environmental protection". That is measured as "the percentage of state expenditures spent on environmental and natural resource programs". The higher that share, the larger is the probability for the adoption of hazardous waste regulation. Moreover, her study reveals that states with liberal electorates have a higher probability to

adopt environmental policy innovations. To capture the effect of interest groups, Sapat includes a variable measuring the strength of environmental groups in each state. The assumption, that the stronger they are, the more likely they are to adopt a hazardous waste regulation program cannot be confirmed. As an explanation, the author proposes that administrative employees cannot be advanced by interest group lobbying, in contrast to elected officials, who feel the pressure of having to be re-elected.

Volden (2006) examines the diffusion of political innovation in the case of policy changes to Children´s Health Insurance Programs in 50 American states over the period 1998 to 2001. He argues that states are more willing to adopt policies that have been proven successful in other states. He presumes that this is because decisions by legislators depend on the success of a program, seeing as their chances of being re-elected will increase upon the implementation of a successful program. His empirical analysis confirms these assumptions.

As already mentioned in the PB literature review in chapter 3.4.1, there are only a small number of studies that use quantitative methods to analyze the diffusion of PB processes.

Wampler (2008) employs two cross-sectional logit models using a dataset of 225 Brazilian cities to investigate the adoption program separately in the first period of adoption between 1997 to 2000 and in the period 2001 to 2004. Wampler analyses the effects of the variables "partisan affiliation of the mayor", "policy networks", "internal determinants" and "regional determinants". Wampler's results show that the existence of a Worker´s party mayor increases the probability of adoption, since PB became an important symbol of this party´s politics. Furthermore, the results show that in the first phase of introduction, PB processes have higher probabilities to be introduced in municipalities where more left-wing parties hold seats in the municipal council. Additionally, Wampler's analysis finds that belonging to a network positively influences the likelihood of adopting a PB. Furthermore, the analysis suggests that wealthier municipalities are more likely to adopt PB in later phases of PB adoption. Wampler also finds out that diffusion patterns differ by region. The results of the statistical analysis show that non-Worker´s Party governments in the South are more prone to implement PB and vice versa.

Spada (2010) further investigates the effect of political competition on the diffusion of PB in Brazil. Analyzing the diffusion pattern of PB in Brazil between 1989 and 2008, he discovers that the diffusion of PB does not follow the typical S-shaped curve like many technocratic policy innovations. He argues that the reason for that is that many cities only adopt PB for one or two election cycles and then abandon it. Spada (2010) assesses PB to be a program that is popular among voters and which mayors implement to increase their chances of being re-elected. Spada's study provides strong support for the hypothesis that political competition has

a significant effect on the adoption of PB in Brazil. He applies various measures of political competition. He includes the "mayor's vote share" and the "second-place candidate's vote share" in the regression analysis to measure the degree of political competition in the mayoral elections. To capture political competition in the legislative chamber, he includes the "share of seats in the chamber held by the mayor's party" and whether the party supporting the mayor has most seats in the legislative chamber. He also controls for the victory of the Worker´s Party in the mayoral election. His statistical analysis shows that the second-place candidate's vote share makes a municipality more likely to implement PB. Furthermore, the victory of the Worker´s Party makes it much more likely that a municipality introduces PB. Spada´s study confirms that geographic and peer proximity are important determinants for the adoption of PB in Brazil. Economic variables are not statistically significant when political variables are controlled for in his model. This result demonstrates that political factors are more important for PB adoption in Brazilian municipalities than economic factors.

Spada (2014) further investigates how political factors influence adoption, continuation, abandonment and re-adoption of PB. He performs logistic regression using a dataset of more than 400 medium-sized and 3 large Brazilian cities in the period from 1989 to 2012. The seat share of the "mayor's party in the city council" and "vulnerability of the mayor" are the most important explanatory factors for the survival of PB processes. Mayors that are more vulnerable, meaning that it is critical for them to loose seats in the city council seats have higher probabilities to implement a PB process and to maintain it. This result suggests that if the mayor has a majority in the city council he or she has support to continue the program. But a mayor that does not feel vulnerable in direct election could behave opportunistically and might have less incentives to adopt or maintain PB. The statistical analysis reveals as the most important factors for explaining adoption and ending PB are the vulnerability of the Worker's Party and the vulnerability of local governments. Furthermore, Spada finds that it does not make a difference for the decision to adopt or continue a PB process if there are slack financial resources available.

The literature presented here has revealed certain factors that seem to influence diffusion patterns of policy innovations. All studies show that geographically neighboring states tend to adopt similar policies. Furthermore, states with a similar demographic and budgetary situation are likely to adopt similar policies over time even if they are not geographiclly close to each other. Factors that influence the probability of PB adoption are geographical proximity, the presence of sufficient resources, strength of interest groups opposing the reform, resources for overcoming obstacles, ideology of the state government and political cycles, the presence of

political advocates, problem severity, institutional factors, prior success of the policy innovation and political competition. Studies that focus on diffusion patterns of PB processes have thus far only been conducted for Brazil.

4.5 Research Hypotheses regarding PB Adoption in Germany

In this section a series of hypotheses are described, based on the theoretical approaches discussed above.

Hypotheses regarding the fiscal situation of municipalities

Chapter 2 and 3 have shown that in Germany many municipalities in circumstances of financial crisis adopt PB processes. Based on the theories already presented, hypotheses relating the fiscal situation of municipalities with likelihood of PB adoption are developed.

There are some arguments in favour of PB adoption to improve economic welfare from a fiscal federalism point of view. A PB process gives citizens an institutional forum to express their preferences, whilst public goods and service provision can be improved. Furthermore, it can help to create fiscal equivalency and thus lead to sounder public finances and more awareness around the costs and benefits of public services. However, looking at the fiscal federal system of Germany, it is to be expected that the effects are limited, due to the level of institutional incongruence. Moreover, individual politicians may not have an incentive to change structures, as the status quo allows them to shift some of their financial responsibility to other governmental levels. Thus, the question remains as to what motivates the politicians that have adopted a PB process to do so, and why so many PB processes can be found in municipalities that face financial difficulties. It has been shown that there is a link between politician's interests and the use of fiscal instruments. Generally, research has shown that politicians use instruments such as increases in expenditures opportunistically if elections are up-coming, in order to rise their chances of being re-elected. Politicians serving in municipalities that are in budgetary crisis no longer have this opportunity. As shown in Chapter 2, municipalities in general have relatively little autonomy over their expenditure. Moreover, those in financial crisis are subject to control by higher government levels.

Thus, they may see it as a last option to inform the public about the bad financial situation of their municipality and ask them to participate in deciding in which areas public spending should be cut. As such, politicians could gain understanding from the citizens for budget cuts and at

the same time gain popularity by letting them participate in the budgetary process, thus decreasing their chances of being punished at the next election. Furthermore, painful budget cuts and reduction of public service are inevitable in such a situation. To engage citizens at an early state will make the implementation of these cut-backs easier. In contrast, politicians serving in municipalities that are well-off financially have no or very few incentives to discuss the budget publicly and thus reap the credit for good financial circumstance within their municipality. Maintaining a large fiscal surplus usually engenders political resistance. Voters often ask for lower taxes or higher public expenditures when a surplus exists. Furthermore, the implementation of a PB process would take away some of their political power, and would decrease the scope for acting in self-interest since public finances would become more transparent.

Thus, from an elected official´s point of view, PB adoption is especially attractive if the municipality in question is in fiscal stress. Such municipalities are already highly constrained in their political decision making, and can garner sympathy by engaging the public. This may explain the observation made in chapter 3, that PB processes in Germany are often focused on saving and are more frequent in *Länder* that have been identified with high levels of municipal debt. Thus, one hypothesis under which economic factors influence the adoption of PB is:

Hypothesis 1: The worse the fiscal health of a municipality, the more likely it is to adopt PB.

The second hypothesis is connected to this and is based on the findings from public choice literature concerning PB as a political instrument for being re-elected. As seen in the previous section, in Germany the use of fiscal instruments to be re-elected has been confirmed in numerous studies. Therefore, the second hypothesis to be tested is that politicians in municipalities with poor fiscal health are more likely to introduce a PB process when elections are close.

Hypothesis 2: Municipalities in poor fiscal health are more likely to adopt PB if elections are close.

Hypotheses regarding the institutional setting of municipalities

From the arguments presented above, it is expected that in Germany many municipalities implement PB processes due to their bad financial circumstances. However, as has been mentioned in the fiscal federalism literature, the institutional design may also play a role in adoption. In Chapter 2, it was shown that in Germany the institutional design of a municipality varies according to the *Land* and the given municipal code. Furthermore, the Public Administration

literature has identified the institutional setting as a factor that positively influences the adoption of PB processes. Thus, it can be asked whether differences in the institutional design influences the decision to implement a PB process. Furthermore, a PB process is a decentralizing instrument and thus differences in the existing degree of centralisation may have an influence on the decision to adopt such an instrument.

Therefore, two hypotheses concerning the institutional design are tested in the following:

Hypothesis 3: Municipalities´ type of constitution has an impact on the likelihood of adopting PB.

Hypothesis 4: The larger the communalisation rate, the more likely is a municipality to adopt a PB process.

Hypotheses regarding political factors of a municipality

The theories and literature review in this chapter have shown that the dominant political ideology has an impact on the likelihood of the adoption of a policy innovation. Therefore, it is also investigated whether the political environment in German municipalities has an influence on PB adoption. As PB is a tool which is usually associated with left wing party ideologies, the chances of adoption might increase with the amount of seats of left parties in the municipal council.

Hypothesis 5: The larger the share of seats of centre-left and left parties in the city council, the higher the probability of adopting PB.

Hypotheses regarding the socio-economic situation of a municipality

Socio-economic and structural pre-conditions as internal characteristics of a municipality influence the motivation to adopt PB. Municipal characteristics defined by socio-economic pre-conditions might affect the decision to adopt PB, as they create a certain environment in their municipality that might increase or decrease the likelihood for PB adoption. In Germany, PB processes are not a tool to fight corruption and inequalities. Therefore, it is not especially the economically disadvantaged parts of the population that ask for PB processes – as was the case in the first phase of PB adoption. Socioeconomic studies on the participants of PB processes in Germany have shown that participants were found to have higher education and higher income than the average for the population (Masser 2012). Thus, it can be argued that the demand for government services and hence the interest in taking part in a PB process should be larger in

municipalities with a relatively high-income population. Moreover, the argument made previously being that municipalities which face fiscal difficulties should be more likely to adopt PB, these municipalities might also be characterized by relatively worse economic pre-conditions. To detect whether the economic environment influences PB adoption, the following hypothesis will be tested:

Hypothesis 6: The socio-economic environment in a municipality influences the probability of adopting PB.

Hypotheses concerning the size of a municipality

The theories and literature presented here suggest that the size of a municipality has an influence on PB adoption. Spada´s study (2010) of PB adoption in Brazilian municipalities revealed that the larger the electorate[30], the larger the probability of PB adoption is. Studies concerning PB adoption in the US named size as a factor that influences PB adoption in a positive way as well. The scale effect can be explained by transactions costs theory. On the one hand, in larger cities the problem of asymmetric information between the municipal government and the citizens is larger leading to higher transaction costs for citizens and politicians. To obtain information, however, is costlier in relatively large municipalities. PB is an instrument that makes information available to citizens. Therefore, PB might be more needed in larger cities while politicians in smaller cities and municipalities already have more opportunities to interact directly with citizens during other activities. On the other hand, PB is itself a costly tool to introduce as it has high fixed costs. Staff must be assigned to deal with the practical operation of PB, in areas such as leading discussions, as well as in evaluating and implementing the proposals. In most cases, resources must be spent to build a website for the PB process, which itself then has to be maintained. For most of these processes, the fixed costs are much bigger than the variable costs. In larger cities, there are advantages due to the degression of fixed costs, as fixed costs are spread over a larger population. Thus, the average cost of PB introduction is lower in relatively larger municipalities. As PB is often introduced as an austerity measure, municipalities have an incentive to reduce the costs for the introduction of the PB process itself.

Furthermore, municipalities of different size offer different kinds of services and thus have different kinds of expenses. For example, cultural institutions such as theatres and museums will mostly be found in larger cities and are also used by residents from the surrounding mu-

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[30] He also tested the effect with the population size instead of the size of the electorate with similar results (Spada 2010, p. 17).

nicipalities. Therefore, large cities might have more incentives to introduce PB, as they ultimately have more budgetary issues to discuss and face higher expenditure and thus fiscal problems, simply because they have to provide more public goods than smaller municipalities nearby.

The hypotheses concerning the influence of size on PB adoption are formulated as:

Hypothesis 7: The larger a municipality is, the higher the probability for adopting PB are.

Hypothesis 8: The larger a municipality and the more indebted it is, the more likely it is to introduce PB.

Hypotheses regarding the innovation climate of a municipality

In the studies presented so far regarding the diffusion of policy innovations, the degree of innovativeness within the environment has not been considered. Economic models concerning the diffusion of innovations take this into account. The economic rank model of adoption assumes that the members in a population are heterogeneous in their adaption behaviour towards innovation, and thus these differences influence the probability of the adoption of the innovation (Greenhalgh/ Rogers, 2010, p. 180). The model assumes that this difference can be represented by a single index which ranks the members of the population from those least likely to introduce an innovation to those most likely to do so. The distribution of the index values corresponds to a normal distribution. When the costs of introducing the innovation are still high, only a few with a high index value adopt the innovations. In a later phase during which the price for the innovation is falling, members of the population with lower index values will adopt the innovation until the adoption rate reaches its maximum at the peak of the curve. After reaching the maximum, the probability for adoption decreases and so does the adoption rate until the point of saturation is reached (Greenhalgh/ Rogers, 2010, p.180).

When it comes to the adoption of a political innovation like PB, a similar adoption pattern can be expected. The first municipalities to adopt will have higher costs as the first pioneers have to spend more on marketing and promotion activities to make the tool widely known and to attain support for it. After some pioneers have implemented a PB process, it will become more widely known and the following municipalities will have less costs in making it popular. In addition, as more and more processes are adopted, more companies will offer their services in organizing and managing a PB process. As competition among these firms grows, the costs for these services will decrease, which will prompt more municipalities to adopt PB.

As the diffusion of PB processes is not yet very widespread, it can be argued that the diffusion is not yet in the middle part of the curve when the adoption rate is very high, but still at the beginning of the curve where only a small proportion of municipalities is likely to adopt a PB process. These pioneering municipalities should be characterized by politicians and an electorate climate more open to innovations with all the uncertainties they include. An innovative climate in a municipality will affect the likelihood that information reaches the adopters positively. The innovative climate of a municipality is measured by the size of its service sector. Municipalities with one or more universities and a high share of employees in the service sector are characterized by an environment that generates new knowledge and thus drives innovation. The hypothesis concerning the innovative climate for PB adoption is:

Hypothesis 9: Municipalities characterized by a positive climate for innovations are more likely to adopt a PB process.

Hypotheses regarding geographical proximity of municipalities
A hypothesis concerning regional influences on PB adoption will be tested following the literature on the diffusion of political innovation. The epidemic model of diffusion is widely used to explain the diffusion patterns of economic innovations. It puts an emphasis on geographic proximity in the transfer of the knowledge of innovation. The assumptions of such a model are that there is a fixed population of potential adopters who do not differ in their characteristics, except that a certain proportion of that population have already adopted an innovation. As random encounters between adopters and members that have not yet adopted the innovation take place, there is a fixed probability that the latter will also adopt the innovation. The probability for a meeting like that is dependent on the proportion of the population that has already embraced the innovation and thus varies throughout the diffusion process. According to the epidemic model, the diffusion of a given innovation follows an S-shaped curve. In the beginning, relatively few members of the population have adopted the innovation. As more and more members adopt it, the chances of meeting such an adopter increases and thus the rate of adoption increases until the proportion of adopters has become larger than the number of non-adopters and the probability of finding a non-adopter gets smaller; thus the rate of adoption decreases and reaches eventually saturation (Greenhalgh/ Rogers, 2010pp. 179).

This model can also be applied to explain the diffusion of PB processes. The probability that information about the PB process reaches potential adopters is larger when there are already more municipalities in geographic proximity employing PB processes. Furthermore, as citizens

in non-adopting municipalities learn about the tool of PB when neighbouring municipalities employ it, politicians are likely to feel pressured to also adopt a PB process. According to the yardstick model, voters measure the politics of their municipalities in comparison to the surrounding neighbours. If a neighbouring municipality takes an action, for example to reduce taxes, this increases the incentives for or pressure on politicians in the surrounding municipalities to reduce taxes as well (Brueckner 2003, Salmon 1987).

Thus, it can be assumed that the adoption of a PB process in one municipality puts similar pressures on politicians of municipalities in proximity. Hence, the hypothesis concerning the effect of geographic proximity on PB adoption is:

Hypothesis 10: The probability that a municipality will adopt PB is positively related to the number of municipalities in a county that already employ PB.

Having presented hypotheses concerning the adoption of a PB process resulting from the theories and literature review presented, the next section summarizes the main arguments and hypotheses of this chapter.

4.6 Chapter Summary

The focus of this chapter has been to find an explanation for PB adoption from an economic perspective. Studies from Public Administration science that examined citizen participation in budgetary policy have found that citizen participation in budgetary matters does not have a direct impact on decision making or help in aligning priorities in local government budgeting. With regard to the factors that influence the likelihood of PB adoption, the government form, the population size and diversity of a municipality as well as the municipal political environment have been identified as important.

Fiscal Federalism theories can be used to explain which positive effects PB processes can have on the economic welfare. Due to the decentralizing effect of a PB process, they can lead to a better fulfilment of citizen´s preferences when it comes to the provision of public goods and services. Furthermore, PB processes give citizens the opportunity to reveal their marginal benefits and they can be compared to the marginal costs of public good provision. The current system does not explicitly offer incentives for local decision-makers to adopt PB. Public Choice theory and findings from empirical research have been applied to explain why decision-makers might nonetheless opt to introduce a PB process. If it is assumed that politicians act as self-

interested individuals, then it follows that they are interested in being re-elected. By introducing PB, they can to some extent disseminate responsibility for unpopular budgetary cuts. Even if the citizens cannot make a final decision about the budget, they might gain some feeling of responsibility by being involved and from having had the opportunity to make suggestions of where to cut the budget. Furthermore, if they gain understanding of their municipality's financial decision, they might have more sympathy for budgetary cuts. On the other hand, politicians in fiscally healthy municipalities have less incentive to introduce PB as they do not want to give up power and rather want their own political actions to be associated with them. Empirical findings in the Public Choice literature confirm that the fiscal decisions of local politicians can be explained by Public Choice motives. More precisely, politicians use fiscal policy to improve their re-election rather than to improve the economic situation, at the municipal as well as at higher levels.

Moreover, the diffusion of innovations literature has been reviewed to find explanatory factors for the diffusion patterns of PB processes in Germany. In the literature of diffusion of political innovations, such as a PB process, explanatory factors for diffusion are divided into internal characteristics and regional diffusion.

Based on the theoretical approaches discussed in this chapter, ten research hypotheses concerning explanatory factors for PB adoption in German municipalities have been developed. These hypotheses argue that the fiscal situation, the institutional setting, political factors, the socio-economic pre-conditions, the size, the innovation climate, and the geographical proximity to other municipalities employing PB influence the likelihood of PB adoption.

In the next section, a dataset, variables, and research design are outlined as means to test these hypotheses.

5. Empirical Analysis

In the following chapter, the central data sources of the thesis, the operationalization of variables, and the applied econometric analyses are all presented.

Section 5.1 starts by describing the dataset and variables used in the econometric analyses. Summary statistics are also shown in this section. Section 5.2 describes results from a cluster analysis and from mean value comparisons with t-tests. In section 5.3 a population-averaged logistic regression analysis is performed to address the main research question as to which factors influence PB adoption in Germany. In section 5.4 factors that lead to different stages of PB adoption are discussed. Section 5.5 closes the chapter with a summary.

5.1 Variables and Data

This section introduces the data and variables that are used to operationalize the factors that influence the adoption of PB on the municipal level.

The sample used for the empirical analysis consists of 2,951 German municipalities for the years 2008 to 2014. The year 2008 is chosen as a starting point because only a handful of PB processes can be identified for the years before.

As a data source for the dependent variable *PB adoption* the database provided by *Bundeszentrale für politische Bildung* (*Federal Agency for Civic Education*) was primarily used. This database systematically researches and lists PB cases in Germany. The database also provides basic information on the design of the respective procedure, the size of the municipality and its geographical location. In addition to that database, internet-based research of all the municipalities´ websites, as well as cross-checking with newspaper articles, journal articles and relevant books was conducted. In this analysis, the definition of PB is less restrictive than in other studies. Spada (2010) for example requires a municipality to have conducted a PB process at least for two years in each electoral term to count as a PB process. However, in the following, municipalities that only discuss the introduction of PB or hand out information about it are considered as having a PB. The justification for this is the assumption that even municipalities that merely consider introducing PB face similar circumstances as the ones that do employ PB. Furthermore, only 121 PB processes can be identified as "continued" processes. Even when considering the pre-forms as a yes-case for PB, only 5 percent of the observations in the dataset have employed a PB process.

Thus, extensive research has been done to gather the data for the dependent variable, but this does not mean that all existing PB processes have been recorded. After all, there is no state register that officially documents PB processes in Germany.

Table 5.1. shows the hypotheses in combination with the variables used to test each hypothesis, as well as a description of the variables and the expected sign of the estimation coefficient. A detailed account of all variables and their sources are given in the appendix (see table 1 appendix).The database provided within the project "Wegweiser Kommune" managed by the *Bertelsmann Stiftung* served as the main source for the budgetary, socio-economic and demographic data.[31] Since well-prepared data on municipal level is rarely available in Germany, the project "Wegweiser Kommune" prepares and publishes official data of all German municipalities with more than 5,000 inhabitants with the goal of providing local decision-makers and citizens with data, scientific studies and recommendations for political actions on a municipal level. The data come from the statistical offices of the *Länder* (Statistische Ämter des Bundes und der Länder n.d.).

According to the Federal Statistical Office, the quality of the municipal data reporting continues to be influenced by the introduction of double-entry accounting at the municipal level in individual *Länder*. Thus, the municipal level data tend to contain missing values. The data for revenues and expenditure for the year 2009 comprise preliminary cash flow statistics, while the data for the years prior to that come from the annual accounts. The *Länder* of Hesse and Saarland have not published data on municipal level in the time period under consideration, as they have faced problems in switching from the cameralistic accounting system to the double-entry accounting system (Bertelsmann Stiftung 2017, p. 2 sub seq.) Due to the incomplete data, the number of observations for different variables differs. Table 5.2 shows summary statistics for all variables, providing insights about the number of observations for each variable.

To test hypothesis 1 concerning the effect of fiscal health of a municipality on PB adoption, the variables *Debt per capita*, *Short-term lendings per capita,* and the variable *Fiscal,* which is the ratio of expenditures and revenues, are used. While the variable *Debt per capita* shows the overall liabilities of a municipality, the variable *Short-term lendings per capita* is an indicator of whether there is a severe budgetary crisis. Short-term lendings are a certain type of public sector loan which was meant for short-term liquidity problems. However, as shown in chapter 2, many municipalities have been using short-term lendings as a long-term financing tool. This means that many municipalities are not even able to cover current expenditure with current

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[31] See Bertelsmann Stiftung: https://www.wegweiser-kommune.de/statistik/essen+finanzen+2016-2018+tabelle

revenues. Positive signs are expected for these variables. The variable *Fiscal* is an additional measure for the fiscal viability of a municipality. A negative sign is expected for that variable.

To test for the influence of upcoming elections on the likelihood of PB adoption, the variables *Election, Election2* and the interaction terms *Interaction election / Debt per capita, Interaction Election2 / Debt per capita* have been constructed. The variable *Election* is coded 0 if the year is not an election year and coded 1 if an election happens in that year. The variable *election 2* takes the value 1 if it in that year and the following year, there is no election and 0 if in either of these years, there is an election. As the hypothesis is that PB adoption is more likely when elections are close, positive sign are expected for the coefficients of *election* and *election2*. Furthermore, the coefficient for *election* should be greater than that for *election2*.

Moreover, an interaction term of the election year and fiscal health of a municipality is included in the regression model, where a positive coefficient is expected.

To test *hypotheses 3 and 4,* concerning the effect of the institutional design of PB adoption, two variables are included in the model. To test whether a relatively stronger mayor influences the adoption of PB, the variable *Constitution type* is included in the model. This variable measures the differences in balances of power between the mayor and the city council based on different communal constitutions. Bogumil and Holtkamp (2013, p. 39) developed a scale that distinguishes between cities that can be characterized as consensual democracies and those that can be characterized as competitive democracies. The scale ranges from 12 to 20 and is measured on *Länder* level, since the *Länder* define the communal constitutions. The higher the number on the scale for any given *Land*, the more consensual the system is. That means that the balances of power between city council and mayor are in favour of the mayor. As the hypothesis is that municipalities in which relatively more power is granted to the mayor by the constitution are more likely to adopt PB, a positive coefficient is expected.

Furthermore, the variable *Communalisation rate* is added to the model. This variable is calculated by dividing the direct expenditure of municipalities in one *Land* by the total expenditures of the *Länder*. Data for the communalisation rate are calculated based on data published by the Statistical Offices for the *Länder* for the years 2008 to 2011[32]. A positive coefficient is expected for that variable. Both variables only vary on the *Länder* level.

To test *hypothesis 5,* that the ruling political party within a municipality influences the likelihood for implementing a PB process, the variables *Share SPD* and *Share Grüne* in the municipal council will be included in the regression model. As diffusion studies concerning PB suggest that parties on the left of the political spectrum are more likely to adopt PB and some studies

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[32] Statistisches Bundesamt Fachserie 14 Reihe 3.1.

concerning German PB processes assume the same, a positive coefficient is expected for these variables (Holtkamp 2012).

The political landscape at the municipal level is rather fragmented. As some parties are only specific to certain municipalities, they cannot be taken as an indicator for the general impact of political ideology on PB adoption. Thus, only municipal election results of the parties with federal level importance – that is *SPD, CDU/ CSU, FDP, Die Linke* and *Bündnis 90/Die Grünen* – were collected. The data were obtained from the statistical offices or from the Ministry of the Interior of the *Länder.*

A set of socio-economic control variables will be included in the multivariate regression analysis to control for the socio-economic environment of a municipality and its impact on PB adoption (*H6*). The variables *Unemployment rate, Social expenditure* (Euro/ per capita) and *Primary sector*, as well as the purchasing power per capita referred to as *PP* (calculated as the sum of net household incomes divided by the number of households) are considered. For the variables *Unemployment rate, Social expenditure* and *PP* positive signs are expected. For the variable *Primary sector,* a negative relationship is expected, as the hypothesis is that larger municipalities with a low share of employees in the primary sector use PB as an additional communication tool with the citizens. The data for these variables is also part of the database provided by the *Bertelsmann Stiftung*. The data for the *Unemployment rate* and *Primary sector* comes from the Federal Labour Office. The data for the variable *PP* is part of the database provided by the *Bertelsmann Stiftung* as well. The raw data comes from the infas GEOdaten GmbH.

To test *hypothesis 7,* which argues that the size of a municipality has a positive influence on PB adoption, the dummy variable *Size* is included in the multivariate regression model. The data for the population numbers were obtained from the *Bertelsmann Stiftung.* This variable is included as a dummy variable instead of adding the absolute population numbers in the regression analyses directly. The variable population is characterised by a heavily skewed distribution to the right. The skewness value is 24,6 and the kurtosis 825,5. This is because there is a wide range of values reaching from 4,643 to 3,501,872. However, there are only a few outliers at both ends of the distribution that can skew the regression results. Dummy variables are more robust towards the influence of outliers. Furthermore, it is unlikely that the likelihood for adopting a PB process changes with one additional inhabitant. In line with other studies measuring the relationship of size and PB adoption, municipalities are characterised by a set of dummy variables as small, medium-sized or larger cities (Ebdon 2002). The dummy variable indicates if a municipality can be defined as small (5,000 to 20,000 residents), medium-sized (>20,000

to 100,000) or large (>100,000)[33]. In the sample, there are 8,994 observations that fall into the category of small, 2,489 that are medium-sized and 321 cities that qualify as large. *Small* is used as the base category. Thus, a positive coefficient is expected for observations that are medium-sized and large.

An interaction term of the variables *Size* and *Debt per capita* is created to test *hypothesis 8.*

To test *hypothesis 9,* which claims that the more innovative a municipality is the more likely it is to introduce PB, two proxy variables are used to capture the climate for innovations in a municipality. One proxy variable is the variable *Service sector,* which measures the share of employees in the business services sector. As company-oriented service providers function as carriers and generators of knowledge and innovation, this variable provides an indication of a municipality´s state of structural change. A positive coefficient is expected for that variable. The data for this variable is part of the dataset by the Bertelsmann Foundation and were collected originally from the Federal Labour Office.

Another proxy variable for the innovative climate is the *Educationally motivated type of migration.* This is measured by migration gains or losses in the group of 18 to 24 year-old per 1,000 inhabitants. Educationally motivated migration typically takes place in that age group. A high value of this variable indicates a high attractiveness of the municipality for students. Thus, that municipality must provide universities and companies, which are typically generators of knowledge. Therefore, a positive coefficient is expected for that variable. Data were obtained from the *Bertelsmann Stiftung* and originate from the Statistical Offices of the *Länder*.

To test *hypothesis 10,* which addresses the effect of nearby municipalities on adoption – or discussion of adoption – of PB, the variable *Proximity* is added to the model. The proximity effect is measured by the number of PB processes in each *Land* divided by the total number of municipalities in the respective *Land*. Empirical studies suggest also that municipalities located at the border of two *Länder* tend to align their fiscal matters with the *Land* centres (Bertelsmann Stiftung 2019, p. 110). Therefore, this variable *Proximity* is calculated by the number of PB processes in each *Land.*

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[33] According to a definition by the German Reichsstatistik from1871 and the international statistic conference from 1887.

Table 5: Overview Hypotheses, Variables, Description and Expected Sign

Motivation for PB adoption	Hypotheses	Indepedent Variables	Expected sign
Fiscal situation	H1: The worse the fiscal health of a municipality, the more likely it is to adopt PB.	Debt per capita	+
		Short-term lendings per capita	+
		Fiscal	-
	H2: Municipalities in poor fiscal health are more likely to adopt PB if elections are close.	Election	+
		Election 2	+
		Interaction Election/ Debt per capita	+
		Interaction Election 2/ Debt per capita	+
Institutional setting	H3: Municipalities, in which relatively more power is granted to the mayor by the constitution, are more likely to adopt PB.	Constitution type (only varies at *Länder* level)	+
	H4: The higher the communalisation rate, the higher are chances for PB adoption	Communalisation rate (only varies at *Länder* level)	+
Political Factors	H5: The larger the share of seats of centre-left and left parties in the city council, the higher the chance of adopting PB.	Share of left seats (SPD, Linke, Grüne)	+
		Share of center-right seats (CDU/CSU, FDP)	-
Socio-economic situation	H 6: The socio-economic environment in a municipality influences the chance of adopting PB.	Unemployment rate	+
		PP	+
		Social expenditure	+
		Primary sector	+
Size	H7: The larger a municipality is, the higher the chances for adopting PB are.	Set of summy varaibles	+
	H8: The larger a municipality and the more indebted it is, the more likely it is to introduce PB.	Size/ Debt per capita	+
Innovativon climate	H9: In municipalities with a higher share of innovators/ entrepreneurs, the probability of introducing PB increases.	Service sector	+
		Educationally motivated migration	+
Geographical proximity	H10: The probability that a municipality will adopt PB is positively related to the number of municipalities in a county that already employ PB.	Proximity	+

Source: Own composition.

Summary statistics

Summary statitics for the aforementioned variables are shown in table 6. All numbers are shown in Euros and are per capita unless otherwise indicated.

As the datatset is a panel datatset, the summary statistics are decomposed into *overall, between* and *within* components of the data. The *overall* and *within* values are calculated for 28,467 municipality-years of data. The *overall* values show the cross-sectional side of the data showing the standard deviations in relation to differences between individual municipalities, while the *within* values can be seen as the longitudinal aspect of the data, showing individual-level changes over time, observed once in a year over a given period. The average number of years a variable was observed is also shown as *T*. It can be seen in table 5. 2 that the observation periods for different variables differ in lenghts (Stata n.d.) .

Furthemore, the *between* values show the cross-sectional component of the data, as they are calculated over 2,951 municipalities. The *between* variation is the sum of squares of differences between individual means and the whole-sample mean. The *overall* variation and standard deviation is the sum, over all municipalities and years, of the square of the difference between each observation of a variable and the mean (Stata n.d.).

The table also reports minimums and maximums. The difference between the overall, within and between values will be illustrated with the variable *Debt per capita*. The overall value for the variable *Debt per capita,* considering the data as municipality-years, varied between 0 and 42,545 Euros. *Debt per capita* across 2,951 municipalities in the dataset varied between 0 and 34,132 Euros. Debt within a municipality varied between -31,412 and 12,726 euros. The minimum value is a negative, because this value refers to the deviation from each individual municipalities's average.

The variation in the variable *Debt per capita* across 10,496 municipality-years is 1,829 Euros, while it is 1,622 Euros across 2,951 municipalities. The variation observed within a municipality over time is 608 euros per capita on average. Thus, the difference in values of the variable *Debt per capita* is larger between the observations compared to the difference within the observations of one municipality over time in this dataset. Variables that do not change their value in the considered time period have a value of zero for the standard deviation. An example of this is the time-invariant variable constitution. The standard deviation across municipality-years and municipalities is for most of the presented variables larger than that within.

Table 6: Summary Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
PB	overall	.1	0.2	0	1	N = 20657
	between		0.2	0	1	n = 2951

Variable		Mean	Std. Dev.	Min	Max	Observations
	within		0.1	-.8	.9	T = 7
Debt per capita	overall	1698.3	1828.5	0	42545.7	N = 10496
	between		1622.1	0	34132.1	n = 2299
	within		608.0	-31412.9	12726.3	T = 4.6
Short-term lendings per capita	overall	160.9	457.7	0	6870.3	N = 17221
	between		440.2	0	5707.8	n = 2947
	within		129.3	-1650.4	2065.2	T = 5.8
Fiscal	overall	0.03	0.7	-3.0	83.6	N = 17221
	between		0.3	-0.4	13.6	n = 2947
	within		0.6	-13.9	69.6	T = 5.8
Election	overall	0.2	0.4	0	1	N = 26559
	between		0.1	0	0.3	n = 2951
	within		0.3	-0.1	1.1	T = 9
Election 2	overall	0.46	0.5	0	1	N = 26559
	between		0.1	0	0.7	n = 2951
	within		0.5	-0.2	1.2	T = 9
Constitution type	overall	17	2.5	12	20	N = 26523
	between		2.5	12	20	n = 2947
	within		0	17	17	T = 9
Communalisation rate (%)	overall	48.1	4.1	37	55	N = 11788
	between		4	37.8	53.3	n = 2947
	within		1.2	45.6	53.1	T = 4
SPD (%)	overall	26	10.9	1.5	73.7	N= 24000
	between		10.6	10.6	68.9	n= 2876
	within		3	3	67.7	T= 8
Grüne (%)	overall	8.8	5	0.3	45	N= 18595
	between		4.5	0.3	30.5	n= 2431
	within		2.2	-2.7	40.5	T=8
Linke (%)	overall	10	9.3	0	54.5	N= 7753
	between		9	0.1	50.8	n= 1407
	within		1.8	-8.5	32.2	T=6
CDU (%)	overall	37.6	11	2.5	88	N= 19685
	between		10.3	3.5	70.6	n= 2370
	within		3.8	8.3	83.7	T= 8
FDP (%)	overall	6.5	4.3	0.3	66.6	N= 19314
	between		4.1	0.3	50.3	n= 2453
	within		1.8	-16.6	48.9	T= 8
Unemployment rate	overall	9.3	5	1.4	37.8	N =17199
	between		4.7	2.1	31.7	n = 2950
	within		1.7	.1	19.6	T = 5.8
Social expenditure	overall	26	94.1	-185.7	1436.2	N = 17213
	between		91.7	-24.4	836.9	n = 2947
	within		20.3	-355.7	625.3	T = 5.8
PP	overall	43814	7487.2	15529	133925.5	N = 17621
	between		7450.8	26777.4	123988.3	n = 2950
	within		1233.1	32557.4	53751.13	T = 5.8
Primary sector (%)	overall	1.8	2.7	.01	54.8	N = 12415
	between		2.7	.02	54.03	n = 2925
	within		.7	-5.8	15	T = 4.2
Population (absolut)	overall	23925	89163.1	4643	3501872	N = 11804
	between		89171	4875.3	3459237	n = 2951
	within		776	-3636.8	66560.2	T = 4
Size	overall	1.3	0.5	1	3	N =11804
	between		0.5	1	3	n = 2951
	within		0.04	0.5	2	T = 4
Service sector (%)	overall	8.3	6.8	.2	77.9	N = 14217
	between		6.5	.4	76.7	n = 2949
	within		1.9	-26	42.7	T = 4.8

Variable		Mean	Std. Dev.	Min	Max	Observations
Educationally	overall	-20.7	32.3	-171	199	N = 17028
motivated migration	between		31.3	-138	175.8	n = 2950
	within		10.4	-120.2	50.8	T = 5.8
Constitution type	overall	17	2.5	12	20	N = 26523
	between		2.5	12	20	n = 2947
	within		0	17	17	T = 9
Proximity[34]	overall	2.7	5.7	0	100	N = 26559
	between		4.3	0.4	77.8	n = 2951
	within		3.8	-30.4	58.2	T = 9

Source: Own calculations.

In the following section, results of a cluster analysis and mean value comparisons are presented.

5.2 Differences between Municipalities with and without PB

This chapter presents the results of an explorative analysis with regard to factors that influence PB adoption. Section 5.2.1 shows the results of a cluster analysis while section 5.2.2 discusses the results of a comparison of means with t-tests.

As there are not yet studies that analyse PB adoption econometrically, this section contains explorative analyses of the factors that influence PB adoption. Thus, relationships between different dependent variables and PB adoption and the structure of the dataset can be explored. Due to multicollinearity, not all available variables can be included in the regression analysis performed in chapter 5.3. and 5.4. Therefore, they are tested in this section in a cluster analysis and in bivariate analyses.

5.2.1 Cluster Analysis

A cluster analysis is employed to analyse if there are groups of municipalities that have considered or applied PB and those that have not. A pooled dataset for the years 2008 to 2014 is used for the cluster analysis. 4666 observations are included in the analysis. Cluster analysis is a commonly used statistical technique when classification of subjects is the goal. In this case, the k-means cluster procedure is used. It searches for the best arrangement placing similar observations together, forming a cluster (Coates/ Andrew 2012). Thus, the procedure can uncover structural differences in a set of variables in the dataset. Based on the presentation of municipal

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[34] The maximum value is 100 because the city states are included in the summary statistics, they do not have neighbouring municipalities as they are city states, and if a city state has a PB in place for all years of adoption covered in the research period, the max value is 100. City states will be excluded from the regression analysis to avoid biased results due to this.

finances and economic theories, the variables *population, Debt per capita, Tax, HR expenditure, Social expenditure* and *Balance* are included in the explorative analysis. [35]Table 7 shows the results of the cluster analysis.

Table 7: Cluster Analysis, n=4666, pooled dataset 2008-2014

Cluster	PB	Population	Debt per capita	Tax	HR expenditure	Social expenditure	Balance
1	1	123 000	3 566	935	884	220	-110
2	0	24 867	1 691	828	502	33	-22
Total	0.04	28 337	1 757	832	516	39	-25

Source: Own calculations.

The cluster analysis divides the observations into two groups, of which one is assigned a mean value of 1 for the variable PB whilst the other is assigned 0. Therefore, it can be concluded that there are systematic differences in municipalities with PB and municipalities without PB regarding the chosen variables. The values of the variables *Debt per capita* and *Balance* as well as *HR expenditure, Social expenditure* and *Population* are much higher for municipalities with PB compared to those without. This gives strong support for the hypothesis that the fiscal situation of a municipality has an influence on the likelihood of PB adoption.

5.2.2 Mean value comparisons

This section shows the results of an analysis of mean values for different budgetary, political, socioeconomic, demographic and institutional variables within the group of municipalities that have adopted or have considered adopting a PB process and also within the group of municipalities that do not employ PB, based on the dataset compiled for this thesis. The difference of mean values is tested with t-tests. Pooled data for the years 2008 to 2014 is used for the analysis. The *N* for individual variables is given in the tables.

All numbers are shown in euros and are per capita unless otherwise indicated.

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[35] See appendix table 1 for a detailed description of variables.

Budgetary characteristics

Table 8 displays the mean values for different budgetary variables. It is expected that the budgetary situation is a dominant explanatory variable for the introduction of PB. Therefore, it is expected that there are significant differences in the mean values between municipalities with and without PB. The hypothesis is that municipalities with PB have higher average level of debt and a less favourable primary, financial, secondary and assets balance.

Table 8: Comparison of Means Budgetary Variables

		Debt per capita	Debt change (%)	Short-term lendings per capita	Primary balance	Financial balance	Secondary balance	Assets balance
No-PB	Mean	1 605	-8	164	-14	-14	-28	7
	SD	1 793	507	463	338	64	352	131
	Min	0	-35 110	0	-4 756	-1 891	-4 722	-4 095
	Max	40 922	12 618	6 870	9 070	1 828	9 466	3 435
	N	6 699	6 667	11 327	10 947	10 947	10 947	10 947
PB	Mean	3 438	3	575	-54	-23	-77	3
	SD	2 269	31	997	238	56	251	65
	Min	0	-67	0	-1 449	-222	-1 667	-443
	Max	12 183	423	5 636	777	317	802	185
	N	307	305	428	405	405	405	405
	t-value	-13.95***	-1.71	-8.5***	3.22	3.31	3.78	1.17

Source: Own calculations.

As expected, the mean values of the variables *Debt per capita* as well as the *Debt change* and *Short-term lendings per capita* are much higher for the group of municipalities in the sample that have considered or applied PB in comparison to the group of municipalities that have not. The variable *Debt change* measures the change of debt from the previous year. Short-term lendings are intended for short-term liquidity problems. However, in recent years many municipalities have been using them as a long-term financing tool. That means that many municipalities were not even able to cover current expenditure with current revenues. The different mean values show that the problem has been much more severe among the PB municipalities.

In addition, PB municipalities have larger budget deficits than no-PB municipalities. More especially, the negative primary balance indicates a structural deficit, since the current revenues do not cover the current expenditure. Municipalities with long-term deficits do not have resources to pay interest expenses, to make investments or to pay off debt. They also have a lower accumulation of assets, as shown by the variable *Asset balance*. If the asset balance becomes zero or even negative, a municipality is in danger of becoming over-indebted. That the mean

value for the variable assets balance is much lower in municipalities with PB shows that these municipalities face financial difficulties.

Considering the difference in mean values of the budgetary variables, the hypothesis that especially highly indebted cities consider and/or apply PB processes receives support. T-values presented in the bottom line of table 5.4 suggest that the differences in mean values are statistically significant for the variables *Debt per capita* and *Short-term lendings per capita.*

Table 9 shows the mean values for the variable *Debt per capita* by stage of adoption The mean values for the municipalities in the stages pre-form and introduction are almost the same. However, the average value of *Debt per capita* is around 1,000 euros less for municipalities in the category "continued". Municipalities that gave up PB again have a similar mean value of debt as the municipalities in the stage "pre-form" and "introduction". From the data, it cannot be concluded whether municipalities abandon a PB process because the process did not help to reduce municipal debt or whether a municipality got indebted again after abandoning the PB process.

Table 9: Comparison of Means of the Variable Debt per Capita by Category

Category	Mean
No PB	1 600
Pre-form	3 490
Introduction	3 535
Continued	2 595
Abandoned	3 124

Source: Own calculations.

Expenditure and revenues

Table 10 shows the average values for different categories of expenditure and revenues for municipalities that have PB, and that do not have PB. These variables were chosen as chapter 2 has shown that there are important differences between municipalities when it comes to various revenue and expenditure sources.[36] The hypothesis is that municipalities with PB have higher mean values for all the expenditure-related variables and lower mean values for the variable *Revenues*. In terms of overall revenues and expenditure, the mean values of municipalities with and without PB show only small differences. Interestingly, the PB municipalities have

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[36] See appendix table 1 for a detailed description of variables.

slightly higher revenues but also higher expenditures. However, some other categories show large differences in mean values between the two groups.

Table 10: Comparison of Means Expenditure and Revenue Categories

		Expenditure	Social expenditure	HR expenditure	Rate support grants	Investment grants	Income tax	Trade tax	Revenues
No-PB	**Mean**	**1 543**	**21**	**499**	**196**	**91**	**330**	**307**	**1 529**
	SD	595	83	321	137	89	134	473	637
	Min	-2 448	-186	0	-3	-138	4	-317	-1 283
	Max	13 267	1 222	3 275	1 008	1 766	1 279	15 889	18 273
	N	10 947	10 936	4 982	10 946	10 947	11 216	11 216	10 947
PB	**Mean**	**1 982**	**179**	**869**	**267**	**108**	**324**	**387**	**1 928**
	SD	749	245	405	194	87	129	359	701
	Min	-942	-86	221	0	-7	33	62	-596
	Max	8 054	1 436	2 773	909	601	1 087	3 961	7 519
	N	405	405	182	405	405	433	433	405
	t-value	-11.65***	-12.97***	-12.2***	-7.3***	-3.96***	0.95	-4.49***	-11.27***

Source: Own calculation.

Looking at the expenditure side, the difference in the mean values of the variable *Social Expenditure* stands out. Its mean value is far higher in municipalities with PB compared to no-PB municipalities. Therefore, PB municipalities can be described as municipalities in a more problematic socioeconomic situation.

Furthermore, the HR expenditure is much higher in municipalities with PB than in municipalities without PB. One explanation for this could be the fact that larger cities have much higher administrative costs and that it is primarily larger cities with PB. However, the following three scatter plots suggest a similar relationship between staff expenditure and size when considering all municipalities, the group of municipalities with PB and the group of municipalities without PB.

There are different conclusions which can be drawn about the relationship between city size and administrative cost. One is that larger jurisdictions should have lower average costs for staff because of the economics of scale. Another is that a larger population size might affect efficiency negatively through higher administrative costs because of a lower population homogeneity, reduced flexibility of the institutional framework, higher information costs and a larger number of beneficiaries (Newton 1976, Richardson 1973). Furthermore, HR expenditure might

be larger in larger cities due to higher wages, more expensive land, etc. HR expenditure additionally depends on the age structure of the civil service.

More importantly, large cities often fulfil additional tasks. Oates has called this the *zoo effect*, because a zoo is typically only added to the spectrum of tasks in large cities (Oates 1988). Cities typically offer a wider range of specialized services like i.e. museums, galleries, concert halls, theatres, libraries or parks. These are also used by residents from neighbouring smaller municipalities. Thus, they attract commuters and in so doing necessitate additional expenditure on highways and transportation.

Figure 25: Population Size Municipalities without PB & HR Expenditure
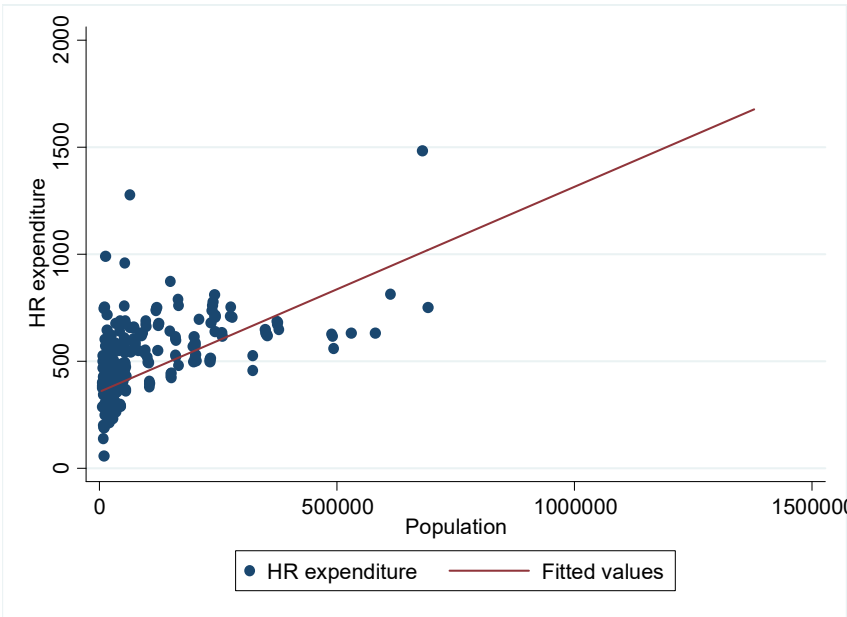
Source: Own composition.

Figure 26: Population Size Municipalities with PB & HR Expenditure
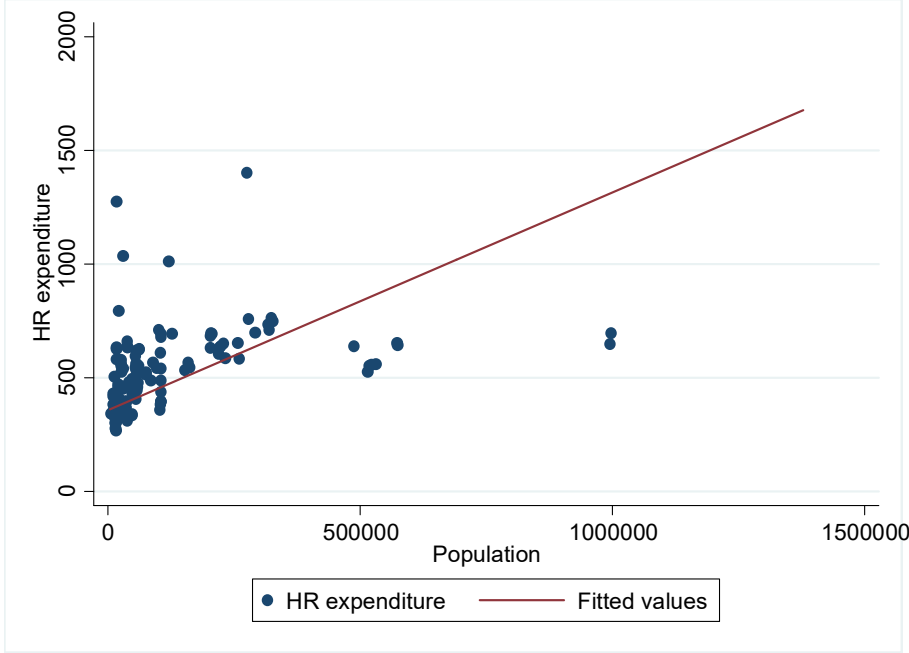
Source: Own composition.

Figure 27: Population Size all Municipalities & HR Expenditure
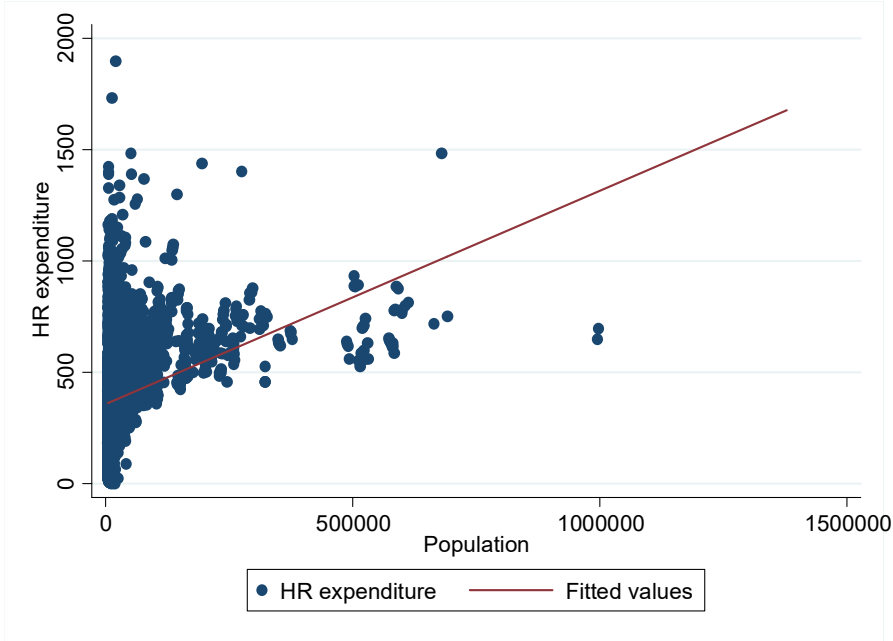
Source: Own composition.

With regard to the dataset at hand, it can be noted that municipalities with PB are on average larger (see table 13), and thus have higher HR costs for several reasons.

Next to tax revenues, grants are the most important source of income. Municipalities with PB are on average more dependent on the grants allocated by the *Land* than municipalities without

PB. This means that they have a smaller share of the budget which can be decided upon auton-omously and which can be subject to negotiation during a PB process.

T-tests reveal that all the differences in mean values are statistically significant, except the dif-ference in the variable income tax. This result is not surprising as the income tax is divided according to the number of residents.

Institutional characteristics

Mean value comparisons in table 11 show differences in the type of constitution between mu-nicipalities that haven employed PB and those that have not. The group of municipalities with PB have an average value of 16, while the no-PB municipalities have a mean value of 17. A higher number on the scale means a stronger mayor in relation to the council. Therefore, these numbers would not give support to the hypothesis that a strong mayor has a positive impact on PB adoption in this sample. A T-test confirms these results. Even though the difference in mean values for variable constitution is small, it is significant. Municipalities with PB have on aver-age a lower value for the variable constitution than municipalities without PB.

Table 11: Comparison of Means Municipal Constitution

		Constitution
No-PB	**Mean**	**17**
	SD	2
	Min	12
	Max	20
	N	19541
PB	**Mean**	**15.8**
	SD	3
	Min	12
	Max	20
	N	1088
	t-value	15.3***

Source: Own calculations.

Political variables

Table 12 shows the mean values of the share of parties in the municipal council.

Of all the considered parties, the variable *Share CDU/CSU* has the largest mean values in mu-nicipalities with and without PB. However, its mean value is larger in municipalities without

PB compared to its mean share in municipalities with PB, while it is the opposite for the variable *Share SPD*, *Share Grüne* and *Share FDP*. They have larger shares in municipalities with PB than those without PB. Surprisingly, the mean value of the seat share for the variable *Share Die Linke*, which is most at the left of the political spectrum of the considered parties, is smaller in municipalities with PB than those without. In other countries, especially Brazil, PB adoption has been positively correlated with leftist parties.

Thus, the comparison of seat shares of the political parties does not show a clear relationship between political ideology and PB adoption. This is in line with the theoretical assumptions about political ideology and PB adoption in Germany. Holtkamp (2012, p. 268) believes that left-wing parties, especially *Bündnis 90/Die Grünen* and *Die Linke*, which have also listed citizen participation on their agenda, push the adoption of PB processes. In some Eastern German municipalities, *Die Linke* has been identified as a driving force for PB adoption (Orbit 2010, pp. 9-11).

Table 12: Comparison of Means Political Variables

		Share CDU/ CSU	Share SPD	Share Grüne	Share Die Linke	Share FDP
No-PB	**Mean**	**37.7**	**25.8**	**8.6**	**9.7**	**6.4**
	SD	11	11	5	9	4
	Min	2.5	1.5	0.3	0.1	0.3
	Max	87.8	73.7	35.9	54.4	66.6
	N	14325	17638	13533	5482	14075
PB	**Mean**	**35.17**	**28.7**	**10.4**	**8.4**	**7.2**
	SD	10	10	5	9	3
	Min	13.2	4.5	0.4	0	0.7
	Max	67	61.8	33.5	39.7	21.8
	N	989	1028	924	545	959
	t-value	-7.9***	-9***	-9.71***	3.25**	-6.84***

Source: Own calculations.

Demographics and education

Table 13 shows a set of variables that describe the demographic situation and educational level of the municipalities in the sample. It is expected that municipalities with PB are on average larger than municipalities without PB. With regard to the other demographic variables, the theory-guided discussion does not imply any conclusions as to whether they have an influence on PB adoption or as to the direction of this influence. Therefore, the mean value comparisons are

an explorative analysis to detect whether there are differences in the data that can be explained by theoretical considerations.

Table 13: Comparison of Means Demographic Variables

		Population	Elderly dependency Ratio (%)	Foreigners (%)	Educationally motivate migration (%)	Average age	Median age	Early school leavers (%)	Abitur (%)	High potentials home (%)	High potentials work (%)
No-PB	Mean	18 969	35	7	-24	44	45	3	45	8	6
	SD	42 241	6	4	33	2	2	1	8	1	4
	Min	4 643	12	0	-171	37	36	0	26	23	0
	Max	1 378 176	90	33	199	55	60	9	69	11 263	33
	N	11 364	11 180	8 586	11 036	11 140	11 259	275	283	10	8 586
PB	Mean	151 918	35	8	5	44	45	3	47	10	9
	SD	387 951	6	5	46	2	2	2	8	4	4
	Min	5 859	20	1	-138	40	40	1	25	3	2
	Max	3 501 872	70	27	159	50	53	13	67	25	23
	N	440	438	419	436	437	438	142	144	439	439
t-value		-7,2***	-0,5	-8***	-13,4***	-1,9	1	-1,3	2,6*	-11***	-8***

Source: Own composition.

The table shows that the group of municipalities with PB has on average a much larger population than the group of municipalities that have not employed a PB process. This large difference in average population can explain most of the differences in the values of other variables in this category.

The variables *High potentials home* and *High potentials work* measure the share of residents or employees with a university degree. As larger municipalities typically attract more university graduates, it is not surprising that the group of PB cities has a larger share of high potentials.

Another large difference can be found in the mean values of the variable *Educationally motivated migration*. This variable measures the migration gain or loss per 1,000 inhabitants in the group comprising 18 to 24 year-olds, the group in which migration for educational purposes typically takes place. A positive value of this indicator points to a high attractiveness of the municipality for students and trainees. While municipalities with PB in the sample have a positive migration balance of 5 percent, no-PB municipalities have an outward-migration of -24

percent. This can also be explained by the fact that municipalities with PB are larger on average and the larger cities typically attract more students and trainees.

There are no significant differences between municipalities with and without PB when it comes to the variables *Average* a*ge, Median age, Elderly dependency ratio* and the *Share of early school leavers.*

Socio-economic environment

Table 14 shows indicators for the economic environment and structure of a municipality. According to the theoretical discussion in chapter 4, socio-economic pre-conditions in a municipality influence the probability of PB adoption. The hypothesis is that municipalities with PB have larger mean values for the variables unemployment ratio, long-term unemployment ratio, PP, tertiary and service sector and lower mean values for the variables primary and secondary sector.

Table 14: Comparison of Means Socio-Economic Variables

		Unemployment ratio (%)	Long-term Un-employment ratio (%)	PP	Primary sector (%)	Secondary sector (%)	Tertiary sector (%)	Service sector (%)
No-PB	**Mean**	8	3	**44 149**	2	38	60	8
	SD	4	2	7 457	3	16	16	7
	Min	1	0	15 521	0	1	1	0
	Max	31	46	122 791	55	87	97	78
	N	11 186	11 155	11 214	9 283	10 596	10 902	10 868
Yes-PB	**Mean**	11	4	**42 382**	1	31	68	12
	SD	4	2	7 084	2	14	14	7
	Min	3	0	27 931	0	9	8	1
	Max	25	12	72 143	23	79	91	46
	N	438	438	439	390	433	432	434
	t-value	-10.63***	-11.76***	5.12***	5.31***	10.68***	-10.93***	-9.8***

Source: Own calculations.

The average *Unemployment ratio* and *long-term Unemployment ratio* are slightly higher for PB municipalities. This finding adds to the finding above that PB municipalities face more social and economic problems. The purchasing power *PP* is slightly lower in municipalities with PB compared to municipalities without PB.

As municipalities with PB are larger on average, it is not surprising that their share of employees in the tertiary sector is higher than in municipalities without PB. Conversely, the share of employees in the primary and secondary sector is higher in municipalities without PB.

The variable *Service sector* measures the share of employees in the business services sector. It is used as a proxy for the innovation climate in a municipality. As the mean value of that variable is 50 percent higher for municipalities with PB, it can be assumed that municipalities with a relatively more innovative environment are more likely to introduce PB. This result is statistically significant.

Proximity

As the literature on policy diffusion widely suggests that the adoption of a policy innovation is strongly influenced by the number of neighbouring municipalities also adopting that innovation, the influence of a nearby municipality that employs PB on other municipalities is also analysed in table 15.

A comparison of mean values for the variable *proximity* shows that there is a significant difference between municipalities with PB and those without. Municipalities that have used PB are located in *Länder* in which on average a share of 9 percent of all municipalities has adopted PB. Municipalities that have never adopted PB are located in *Länder* where on average 3 percent of all municipalities have adopted PB processes. Thus, if there are more municipalities in any individual Land that have adopted PB, other municipalities in that Land are more likely to adopt PB. This result is statistically significant.

Table 15: Comparison of Means Proximity

		Proximity
	Mean	3
	SD	5
No-PB	**Min**	0
	Max	100
	N	19551
	Mean	9
	SD	14
PB	**Min**	0.1
	Max	100
	N	1106
	t-value	-15***

Source: Own illustration.

This section presented result of a cluster analysis and mean value comparison with t-test. These results suggest that the factors developed based on economic theories, namely the fiscal situation, the socioeconomic environment, the size, the innovation climate of a municipality and geographical proximity influence PB adoption in German municipalities.

5.3 Factors affecting Adoption of PB processes

In this section the hypotheses developed in chapter 4 are tested by employing a logistic regression analysis. Section 5.3.1 explains the methodology applied. Section 5.3.2 discusses the results of the analysis performed. Section 5.3.3 and 5.3.4 present diagnostics and a robustness test for the applied model.

5.3.1 Methodology: Population-Averaged Logistic Regression Analysis

The fundamental research question of this work asks which factors influence the probability of PB adoption in German municipalities. The independent variable is thus a binary variable taking the values 1 for adoption of PB in a given year and 0 otherwise. Therefore, a logistic regression model is employed.

Most of the literature on policy adoption uses event history analysis based on non-linear models and cross-sectional data. However, given the panel structure of the dataset, a method is here chosen that takes into account the fact that observations of one municipality over many years

are very likely to be correlated (Rabe-Hesketh/Skrondal 2008, p.247). Options for this type of data are to use a generalized estimating equation model (GEE) or a generalized linear mixed model (GLM).

Amongst the variations of GLM, fixed effects and random effects models can be distinguished. A fixed effect model is not appropriate for this analysis as it requires large within-subject variability in the variables if subjects are to be used as their own controls. In the following analysis, a subsample of the dataset is used that includes data for the years 2008 to 2012. Some variables do not change much for individual municipalities (although the differences between municipalities are large) in the four-year period considered in the regression analysis. Summary statistics show also that the variation across the observations is much greater than the variation within subjects. Furthermore, variables with values that do not change over time cannot be estimated with a fixed-effects model (Williams 2016, Hardin/Hilbe 2013, p. 147). On the other hand, time-invariant variables like the variable constitution are planned to be included in the following regression analysis. Thus, a fixed-effects model is not the right choice of model.

The use of a random-effects model or a GEE model are further options. GEE models are also called population-averaged logit models (PA models), while random-effects models are called subject-specific models (SS models). Both models account for repeated observations being correlated in panel datasets (Zeger et al. 1988, Hilbe/Hardin 2013, p. 59 sub seq.). Advantages of the random effects models are that they are quite robust to missing data and unbalanced panel datasets and can deal with time-invariant and time-varying covariates (Gibbons/ Hedeker/ DuToit 2010). As such, they allow for the estimation of changes in each subject.

The strengths of PA models include the absence of assumptions about the distribution of residuals and random effects. Therefore, the population-averaged response for a given covariate value is directly estimable from observations without assumptions about the heterogeneity across municipalities in the parameters (Zeger/ Liang/ Albert 1988, pp.1050-1053, Hilbe/Hardin 2013, p. 60).

Therefore, for this analysis a PA model is applied because the data can be considered as a cross-sectional dataset rather than as a times series data set, since there is only a period of four years included in the regression analysis. In addition, for the sample, the variance between subjects is much larger than that within each individual municipality. Moreover, the use of a PA model is better suited to the research question since the aim is to estimate how the number of municipalities that introduce PB changes according to changes in fiscal health, size, etc. and not so much to forecast changes for individual municipalities over time. A further advantage of the PA models is that they allow for data which may not be normally distributed (Garson 2013,

p.203). In addition, the form of the correlation matrix can be specified. Correlation structured of the data that can be defined are: exchangeable, autoregressive, unstructured, and independent. However, if the dataset is large and robust standard errors are calculated, the estimates will be robust, even if the wrong working correlation is specified (Garson 2013, p.203). The exchangeable correlation structure assumes homogeneous correlations across all observations within a cluster. An autoregressive correlation structure has homogeneous variances and correlations that decline exponentially with distance. This is usually appropriate for data that are correlated within clusters over time (Garson 2013, p.203). As the observations in this dataset correlate within clusters for different years, an autoregressive working correlation could fit the data. However, the disadvantage of an autoregressive correlation structure is that it implies a fixed rate of how the correlation of residuals develops. An exchangeable correlation matrix has less restrictions about modelling the true correlation structure within subjects, and is therefore chosen instead for the following regression analysis. This choice is supported by diagnostics tests (see section 5.3.3).

Often, independent variables are lagged in this type of logistic regression analysis. However, in this analysis, independent variables were not lagged. One reason for that is that politicians make the decision to introduce a PB based on their expectation for the year, in which the PB is introduced. Even if there is a lag between the decision for a PB process and the implementation of it, it is not certain whether this lag is actually a year-long or just a few months. However, only yearly data is available for the regression analysis. Furthermore, Bellemare et al. (2015) conducted a Monte Carlo analysis to compare estimation results of lagged and not lagged explanatory variables models. They argue that causality problems are not solved by lagging independent variables. That only moves the causality problem to a different point in the data-generating process. Their finding is that lagging independent variables generates estimates that are more biased and that have higher root mean squared error than just neglecting endogeneity. Moreover, if variables are lagged the calculated estimates that are more prone to be subject of a type 1 error, meaning that researchers reject a null hypothesis that is in fact true. According to Reed (2015), using lagged variables will produce even more biased estimates when the explanatory variable is serially correlated. In summary, estimates can be biased due to lagging variables. Therefore, independent variables in the following empirical analysis are not lagged.

As the dataset used for the regression analysis in this thesis contains clusters where observations within a cluster are likely to be correlated, but observations in different cluster are not correlated, a GEE is used for the regression analysis. The usage of a GEE is also possible if the

relationship between independent variables and the dependent variable is non-linear. The general GEE model is given by the equation (Hardin/ Hilbe 2013, p. 92)

$$\Psi(\beta) = \left(\sum_{i=1}^{n} x_{ji}^{T} Diag\left(\frac{\partial \mu_i}{\partial \eta}\right)\left(V(\mu_i)\right)^{-1}\left(\frac{Y_i - \mu_i}{\alpha\,(\phi)}\right)\right) \tag{1}$$
$$= 0$$

with

$$V(\mu_i) = DiagV(\mu_{it}))^{1/2}\, R(\alpha)\, Diag(V(\mu_{it})^{1/2} \tag{2}$$

Where Ψ is the GEE model in which Y_{ij} denotes the jth response ($j = 1, \dots, ni$), and Xij denotes a $p \times 1$ vector of covariates; μ is the n x 1 vector of the mean expected responses and η is is the generalized linear regression model $\eta i = g(\mu_i)$, where g is a monotonic function called the canonical link function.

Equation 1 also includes the panel effect $\left(V(\mu_i)\right)^{-1}$ which is the extension of the generalized linear model. $\left(V(\mu_i)\right)^{-1}$ is the variance covariance matrix "$n_i * n_i$" and $R(\alpha)$ is the correlation matrix within panels, estimated through the parameter α. ϕ is a scale parameter which has to be estimated.

GEE is solved through an iterative process, starting with the computation of an initial estimate for β. At the next step, the variance-covariance matrix is computed using equation 2. Then β is updated with this information, using equation 1. This is continued until convergence is reached.

Written in terms of the log odds, the model is given by:

logit Pr(PB=1|x_{it}) = β_0+β_1FISCAL+β_2ELEC+ β_3INSTI+ β_4POL+ β_5STRUC+ β_6SIZE+ β_7INNO + β_8PROX+ ε_{it}

where t identifies the years, and i identifies the municipalities that are considered. PB is a dummy variable taking the value of 1 if the municipality in the current year employs PB, has a pre-form of it or discusses the introduction of PB; otherwise it takes the value 0. FISCAL is a vector of variables that capture the fiscal health of a municipality; ELEC is a vector of dummy variables for the election year; INSTI is a vector for regressors capturing the institutional design of a municipality; POL is a vector of political variables, STRUC is a set of variables that capture the socio-economic environment in a municipality; SIZE measures the population size of a municipality; INNO is a vector of variables capturing the climate for innovations in a municipality;

PROX is variable that measures the effect of PB processes in the neighbourhood. See section 5.1 for a description of all variables.

5.3.2 Presentation of Regression Results Regarding PB Adoption

A logistic regression analysis using a population-averaged model (assuming an exchangeable correlation matrix and robust standard errors) is performed to estimate the influence of the different independent variables on PB adoption and to test the hypotheses presented in chapter 4. As the dataset is highly unbalanced due to missing data of the budgetary variables, the estimation sample is smaller than the actual sample. In the estimation sample of the full model (model 12, table 16), 5.4 percent of municipalities have a PB process, while 94.6 percent do not.[37] This distribution of the dependent variables in the estimation sample thus resembles the distribution in the dataset with all observations.

Table 16 shows the results of the logistic regression for different model specifications. The first and the second regression models specifically test the main hypothesis of this work, that indebted municipalities are more likely to adopt PB compared to municipalities that do financially well *(H1)*. The first model contains the variable *Debt per capita*, which measures the debt level per capita in euros and the variable *Fiscal, which* measures the revenue/ expenditure ratio.

In *model 2*, the variable *Short-term lendings per capita*, measured per capita and in euros, is included instead of the variable *Debt per capita* to test the main hypothesis with another proxy variable for the fiscal status of a municipality.

In *model 3* the variables *Election, Election2* and the interaction terms *Interaction election / Debt per capita, Interaction Election2 / Debt per capita* are added to the regression model to test for the influence of upcoming elections on likelihood of PB adoption (*H2*). Furthermore, an *interaction term of the election year and fiscal health* of a municipality is included in the regression model. A positive coefficient is expected for both variables.

Model 4 incorporates political variables in the regression model. It includes the variables *Share SPD* and *Share Grüne* and measures their seat share in the municipal council *(H5)*.

Socio-economic control variables are added in *model 5* and 6. *Model 5* contains the variables *Unemployment rate*, *Primary sector* and the purchasing power *PP,* while *model 6* contains an alternative proxy variable *Social expenditure* instead of *Unemployment rate (H6).*

In *model 7,* the variable *Size* is added to the regression analysis (H7).

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[37] City states (Hamburg, Berlin, Bremen) are excluded from the regression analysis.

To test hypothesis 9, that more innovative municipalities are more likely to adopt PB, the proxy variables *Educationally motivated migration* and *Service sector* are added to the regression *model 9*.

To test for the effect of neighbouring municipalities that have adopted PB, the variable *Proximity* is incorporated into the tenth model. This variable measures the share of municipalities in a *Land* that have adopted PB processes *(H10)*. In *model 10* the variable *Constitution type* is added to control for the institutional environment of a municipality *(H3)*. As another proxy variable for the institutional environment, the *Communalisation rate* showing how many tasks are delegated to a municipality by higher levels of government is incorporated as explanatory variable in *model 11 (H4)*.

Finally, *model 12* shows the full model specification with the main variables *Debt per capita, Fiscal, Election, Share SPD, Share Grüne, Size, Service sector* and *Proximity*. The economic control variables are excluded from that equation as they have an impact on municipal budgets through the increased social expenditure associated with high unemployment. Institutional variables are also excluded from the model as multicollinearity could distort the estimation results since the variables constitution, communalisation rate and proximity are all measured not on municipality but on *Land* level. All municipalities in the same *Land* face the same institutional environment as the municipal code is decided upon by the *Land*. Thus, these variables also measure the effect on PB adoption of being located in a certain *Land*.

The full model specification includes an additional *Interaction term* between the variables *Size* and *Debt per capita*.[38] A positive coefficient is expected for that interaction term *(H8)*.

Table 5.13 shows the full model specification *model 12* with alternative variables for the main concepts to test for the robustness of the results. *Model 12.1* estimated the parameters with the variable *constitution* instead of *proximity*. *Model 12.2* included the variable *Social expenditure* instead of S*ize*. In *model 12.3,* the variable *Short-term lendings per capita* is incorporated into the full model as a proxy variable to measure the fiscal health of a municipality instead of the variable *Debt*. *Model 12.4* tests *High potentials work* as an alternative variable to measure the innovative climate of a municipality*,* measuring the share of employees with a university degree in the workforce instead of the variable *Service sector.*

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[38] Note: Time dummies were not included in the estimation. As time effects are captured by the model and focus is on differences between subjects and not on difference.

Table 16: Results of a Logistic Regression (population-averaged model with exchangeable correlation structure and robust standard errors)

	(1) FISCAL	(2) FISCAL	(3) +ELEC	(4) +POL	(5) +ECO	(6) +ECO	(7) +SIZE	(8) +INNO	(9) +PROX	(10) +CONSTI	(11) +COM-MUN	(12) FULL
Debt per capita	0.466*** (10.62)		0.505*** (9.54)	0.446*** (7.62)	0.295*** (2.60)	0.175** (2.30)	0.111*** (3.45)	0.113*** (3.51)	0.096*** (3.18)	0.115*** (3.37)	0.115*** (3.71)	0.402*** (3.62)
Fiscal	-0.927*** (-3.34)	-0.673** (-2.24)	-0.992*** (-3.64)	-1.002*** (-3.58)	-0.813** (-2.53)	-0.801** (-2.21)	-1.021*** (-3.58)	-1.039*** (-3.62)	-0.741** (-2.19)	-1.030*** (-3.60)	-1.002*** (-3.55)	-0.762** (-2.23)
Short-term lendings		0.984*** (7.67)										
Election 1			-0.068 (-0.58)	-0.085 (-0.65)	-0.300* (-1.67)	-0.274* (-1.71)	-0.211 (-1.59)	-0.175 (-1.28)	0.079 (0.59)	-0.128 (-0.91)	-0.174 (-1.31)	0.163 (1.11)
Election 2			0.122 (0.80)	-0.007 (-0.04)	-0.079 (-0.44)	-0.131 (-0.90)	-0.130 (-0.82)	-0.108 (-0.68)	-0.059 (-0.39)	-0.088 (-0.56)	-0.119 (-0.78)	0.032 (0.18)
Interaction election / debt per capita			-0.070* (-1.89)	-0.055 (-1.33)	-0.002 (-0.03)	-0.022 (-0.40)	-0.026 (-0.76)	-0.027 (-0.74)	-0.042 (-1.02)	-0.034 (-0.87)	-0.027 (-0.79)	-0.072 (-1.44)
Interaction election / debt per capita 2			-0.048 (-1.18)	-0.012 (-0.26)	0.034 (0.71)	0.044 (1.38)	0.028 (0.91)	0.025 (0.81)	-0.002 (-0.06)	0.025 (0.78)	0.028 (0.92)	-0.032 (-0.63)
Share SPD				0.010 (1.22)	0.011 (1.17)	0.008 (0.77)	-0.004 (-0.41)	-0.003 (-0.33)	-0.010 (-0.96)	-0.007 (-0.68)	-0.003 (-0.32)	-0.012 (-1.12)
Share Grüne				0.050*** (3.07)	0.058*** (2.86)	0.025 (1.30)	0.012 (0.67)	0.010 (0.57)	0.001 (0.07)	0.010 (0.54)	0.001 (0.06)	0.001 (0.04)
Unemployment rate					0.600* (1.86)							
PP					0.004** (2.39)	0.004*** (2.94)						

	(1) FISCAL	(2) FISCAL	(3) +ELEC	(4) +POL	(5) +ECO	(6) +ECO	(7) +SIZE	(8) +INNO	(9) +PROX	(10) +CONSTI	(11) +COM-MUN	(12) FULL
Primary sector					-3.569** (-2.23)	-2.311* (-1.80)						
Social expenditure						0.381*** (5.89)						
Medium-sized city							1.976*** (6.06)	1.972*** (5.77)	1.673*** (5.63)	1.777*** (5.47)	1.830*** (5.67)	2.294*** (5.65)
Large city							3.696*** (9.87)	3.555*** (7.80)	3.292*** (8.46)	3.222*** (8.18)	3.307*** (8.62)	3.527*** (4.99)
Service sector								0.486*** (3.82)	0.360** (2.30)	0.473*** (3.45)	0.454*** (3.49)	0.342** (2.09)
Educationally motivated Migration								-0.024 (-0.77)				
Proximity									0.118*** (9.32)			0.116*** (9.20)
Constitution type										-0.145** (-2.47)		
Communalisation rate											0.029 (1.11)	
Interaction debt/ medium-sized city												-0.325** (-2.54)
Interaction debt/ large city												-0.224 (-1.44)

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	(1) FISCAL	(2) FISCAL	(3) +ELEC	(4) +POL	(5) +ECO	(6) +ECO	(7) +SIZE	(8) +INNO	(9) +PROX	(10) +CONSTI	(11) +COM-MUN	(12) FULL
_cons	-4.273***	-3.519***	-4.300***	-4.766***	-6.246***	-5.709***	-4.629***	-5.140***	-5.000***	-2.486**	-6.318***	-5.503***
	(-27.47)	(-30.71)	(-22.40)	(-14.02)	(-6.82)	(-7.14)	(-11.98)	(-11.41)	(-11.81)	(-2.32)	(-5.00)	(-11.95)
N	6723	6723	6723	4953	4117	4120	4969	4656	4723	4723	4723	4707
Tjur R^2	0.1	0.01	0.1	0.04	0.1	0.12	0.15	0.16	0.19	0.17	0.16	0.19

Source: Own calculation.
Coefficients; t statistics in parentheses
* p<0.10, ** p<0.05, *** p<0.010

Table 17: Alternative Variables in Full Model

	(12.1)	(12.2)	(12.3)	(12.4)
Debt per capita	0.401***	0.215***		0.393***
	(3.62)	(3.40)		(3.50)
Fiscal	-1.022***	-0.668	-0.780**	-0.736**
	(-3.49)	(-1.64)	(-2.31)	(-2.16)
Election	-0.006	0.146	0.170	0.144
	(-0.04)	(1.12)	(1.15)	(1.00)
Election 2	0.004	-0.034	0.032	0.034
	(0.19)	(-0.21)	(0.17)	(0.18)
Interaction election / Debt per capita	-0.079	-0.065	-0.074	-0.073
	(-1.66)	(-1.42)	(-1.49)	(-1.50)
Interaction election / Debt per capita 2	-0.07	-0.022	-0.034	-0.032
	(-0.32)	(-0.47)	(-0.67)	(-0.62)

	(12.1)	(12.2)	(12.3)	(12.4)
Share SPD	-0.009	-0.003	-0.011	-0.010
	(-0.9)	(-0.37)	(-0.99)	(-0.97)
Share Grüne	0.011	0.024	0.001	0.001
	(0.6)	(1.37)	(0.06)	(0.05)
Medium-sized city	2.22***		2.272***	2.341***
	(5)		(5.56)	(5.72)
Large city	3.066***		3.422***	3.555***
	(4.30)		(4.79)	(5.09)
Constitution type	-0.141**			
	(-2.42)			
Interaction debt/ medium-sized city	-0.256**		0.097	-0.335***
	(-1.99)		(1.15)	(-2.61)
Interaction debt/ large city	-0.134		0.223*	-0.218
	(-0.88)		(1.82)	(-1.41)
Service sector	0.456**	0.479***	0.340**	
	(3.19)	(4.10)	(2.06)	
Social expenditure		0.280***		
		(4.81)		
Proximity		0.118***	0.119***	0.119***
		(9.15)	(8.85)	(9.47)
Short-term lendings per capita			-0.000	
			(-0.56)	
High potentials work				0.433**
				(2.38)

	(12.1)	(12.2)	(12.3)	(12.4)
_cons	-2.991***	-4.815***	-5.542***	-5.534***
	(-3.19)	(-13.30)	(-12.05)	(-12.23)
N	4707	4704	4707	4885
Tjur R^2	0.17	0.19	0.14	0.20

Source: Own calculation.
Coefficients; *t* statistics in parentheses
* p<0.10, ** p<0.05, *** p<0.010

The results of the logistic regressions show that *hypothesis 1,* claiming that the financial situation of a municipality has a strong influence on PB adoption, can be confirmed. The variable *Debt per capita* is statistically significant at the 1 percent level in all model specifications (Table 16 & 17). The coefficients have positive signs showing that the more indebted a municipality is, the more likely it is to adopt a PB process. The variable *Fiscal* is negative as excpected and is significant at the 1 or 5 percent level in all model specifications. This also shows that municipalities with relatively higher expenditures compared to revenues and thus a worse fiscal situation have higher probabilities to adopt PB. With an alternative variable to capture the fiscal situation of a municipality, namely the variable *Short-term lendings,* these results stay robust. The coefficient of the alternative variable is significant at the 1 percent level as well and has a positive coefficient, once again confirming the hypothesis that municipalities in budgetary crisis are more likely to adopt a PB process. The results of the logistic regression for the effect of elections on the probability to adopt PB are ambiguous *(H2)*. The coefficients of the variables *election* and *election 2* are in most model specifications negative, which is unexpected. In the full model specification, they have the expected positive signs, which would mean that upcoming elections increase the chances of PB adoption. However, the coefficients are not statistically significant. Furthermore, the coefficients of the *Interaction terms* between the variables *Debt per capita* and *Election* are also unexpectedly negative. Again, however, they are not statistically significant. This implies that the hypothesis that municipalities which are in fiscal distress are more likely to adopt PB in a year prior to an election cannot be confirmed. However, these results must be treated with caution as they could be due to the small share of municipalities that employ PB and by the rare occurrence of an election year. The coefficients of the *interaction terms* are very small, not indicating a clear negative effect of elections on the chances of PB adoption. To get a clearer picture of whether these results are based on theoretical reasons or the nature of the data, a regression should be run with data for a longer time period. For this dataset, *hypothesis 2,* according to which PB adoption is more likely, when election are on the horizon, cannot be confirmed.

The results of *model 10* show that the institutional environment influences PB adoption. The coefficient of the variable *Constitution type* is significant at the 5 percent level. As already observed in the bivariate analysis, it also has a negative sign in the multivariate analysis, which is contrary to the expected sign in hypothesis 3. That result would mean that municipalities with a constitution that grants more powers to the municipal council – rather than to the mayor – are more likely to adopt PB.

This is also confirmed in *model 12.1* where this variable is used in the full model specification instead of the variable *Proximity*. However, this result should be handled with caution as it could show the effect of other *Land* specific regulations on PB adoption. The results can be especially biased by the effect of North Rhine-Westphalia, which has a relatively low value for the variable *Constitution type* and a relatively large number of municipalities that have PB. To explicitly test for the hypothesis of the strong mayor encouraging PB adoption, other proxy variables should be included to better identify the presence of a strong mayor.

The variable *Communalisation rate* has a positive sign as expected but is not statistically significant. This suggests that the communalisation rate does not influence the decision to adopt PB. Thus, *hypothesis 4* cannot be accepted. This finding is in line with the data presented in chapter 2, showing that among the *Länder* with relatively high communalisation rates there are both *Länder* with a low and a high number of identified PB processes.

The coefficients of the variables *Share SPD* and S*hare Grüne* have the expected positive coefficients in *model 4* and the variable *Share Grüne* is significant at the 1 percent level. However, in the full model specification, neither of these variables is statistically significant and they have very small coefficients; the coefficient of the variable *share SPD* is even negative in this model specification. This could be due to the small number of municipalities that have adopted PB. In other model specifications, neither of the political variables is significant. Looking at the correlation between the independent variables (see table A2), the variable *Share Grüne* has a higher correlation coefficient with the variables *Service sector* and *PP* compared to the variable *Share SPD*. On the other hand, the coefficient with the variable *Primary sector* is negative, while it is positive between *Share SPD* and *Primary sector*. That might be an indicator for the *Share Grüne* governing in larger, more urban cities. Thus, the variables *Size* and *Share Grüne* could be proxies for each other and thus not be significant in the model specification. From this it follows that variables such as the fiscal situation have a greater influence on PB adoption than political ideology.

The results of *model 5* show the influence of the socio-economic pre-conditions in a municipality on PB adoption. The variables *Unemployment rate* and *Social expenditure* are significant and have the expected positive coefficients. The variable *Primary sector* has the expected negative coefficient, though this is not statistically significant. According to these results *hypothesis 6,* that the socio-economic pre-conditions influence the likelihood of PB adoption, can be accepted. A worse economic situation in a municipality (high unemployment and social expenditure) increases the

likelihood of PB adoption. These variables can be seen as proxy variables for the fiscal situation of a municipality.

Furthermore, it was argued that urban municipalities with an innovative climate – measured by the share of service sector – would adopt a PB process. This is confirmed by the negative coefficient of the variable *Primary sector*, which means that more rural municipalities are less likely to adopt a PB process. This is further confirmed by the fact that the variable *PP* has a positive coefficient, showing that, even though municipalities with higher unemployment rates preferentially adopt PB, those with higher household incomes are also more likely to adopt PB. This again indicates that larger municipalities with an urban economic structure are more likely to adopt PB processes.

The logistic regression results of *model 7* show that the variable *Size* has a significant influence on the likelihood of PB adoption. The opportunities to adopt a PB process are higher if a municipality is characterized as *medium-sized* or *large city* compared to municipalities in the category *small city*. The large coefficients can be explained by the large scale of the population size that determines the values of the variable *Size*. The coefficients of that variable are significant in all model specifications, clearly indicating that within this dataset size is a highly important factor in the decision to adopt PB for municipalities. *Hypothesis 7,* that the larger a municipality is the more likely it is to adopt PB, can be accepted.

The regression results of *model 8* show that the climate for innovations in a municipality positively influences the probability to adopt PB. The variable *Service sector* is statistically significant and has a positive coefficient suggesting that the larger the share of employees working in the service sector, the more likely it is that the municipality in question will adopt a PB process. These results support *hypothesis 9,* that an innovative climate has a positive effect on PB adoption. The variable *Educationally motivated migration* has an unexpected negative coefficient. However, the coefficient is very close to zero and is not statically significant. Hence this variable is not a good proxy variable for measuring the effect on PB adoption of the innovativeness of a municipality.

The results of the logistic regression of *model 9* show that the variable *Proximity* has a positive coefficient and is statistically significant at the 1 percent level. That means that the larger the share of municipalities in a *Land* employing a PB process is, the more likely it is that other municipalities will also implement one. Thus, *hypothesis 10,* that neighbouring municipalities have a positive effect of PB adoption, can be confirmed.

The full model specification in *model 12* also captures the effect of an interaction term between *Size* and *Debt per capita,* as stated in hypothesis 8.

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Among the interaction terms between the variables *Debt per capita and Size,* the one for cities characterized as *Medium-sized* compared to *Small type* of cities is significant at the 1 percent level, while the interaction term between debt and *Large city* is not significant. This outcome might be due to the nature of the data. There are far fewer cities in the large city category: whilst there are 2,489 cities in the medium sized city category, there are only 321 in the large city size category. This result suggests that the correlations between PB adoption and debt are significantly different for different municipality sizes. The coefficients for both interaction terms are negative, indicating that if the variables *Debt per capita* and *Size* rise, the probability of PB adoption decreases. Therefore, smaller indebted cities are more likely to introduce PB than larger indebted cities and larger cities which are not indebted are more likely to introduce PB compared to small cities also not indebted. Hence there seem to be two types of municipalities that are more likely to adopt PB: on the one hand, indebted municipalities are likely to adopt PB, on the other hand; urban, economically highly developed cities employ PB processes.

To summarize: the most important results of the logistic regression are that the fiscal situation, the size, the number of other municipalities adopting PB and the innovative climate influence the probability to adopt a PB process. These results remain robust when tested with alternative proxy variables.

The Tjur R^2 has been calculated for the different regression models (see table 16 & 17). This is a measure for the goodness of fit with the different model specifications using GEE PA models. To calculate the Tjur R^2, the difference of the mean values of the predicted probabilities for each of the two categories of the dependent variable, so yes or no PB, is calculated. The predictive power of a model can be evaluated by the number of cases with events that also have high predicted values and the number of cases without events that have low predicted values (Williams 2020). The calculated Tjur R^2 are quite small. However, this does not mean that the models have a bad fit, but is rather due to the fact that there are only a few cases with events (PB processes). As such it is more difficult for the model to predict the cases with events correctly, for some of the cases without events that have similar characteristics to the cases with events will wrongly be predicted as cases with events. Therefore, cases with events will have in general relatively low predicted values and the Tjur R^2 will be smaller. Nevertheless, the Tjur R^2 values can be used for evaluating the fit of different model specifications. The calculated Tjur R^2 is highest in model specification 9 and 12, which include all independent variables that theoretically should have an influence on PB adoption. This confirms that the fiscal situation, size, proximity and innovative climate of municipalities

influence the decision to adopt a PB process.

Further diagnostics are presented in the next section to see how robust these findings are.

5.3.3 Diagnostics

This section discusses different diagnostics for the GEE PA regression model. First, the estimated coefficients are tested for multicollinearity, then the goodness of fit is estimated for the estimation method and for the independent variables.

The existence of multicollinearity can lead to inaccurate regression results. If two or more independent variables show multicollinearity, it cannot be detected anymore how strongly each variables actually influences that dependent variables. Thus multicollinearity can lead to regression results that are less reliable. A first step to detect multicollinearity is to examine the correlation matrix of the covariates. Table A.2 in the appendix shows the correlation matrix for all variables. Of concern is the degree of correlation, with a value of -0.61 between the variables *Constitution type* and *Proximity*. Both variables are measured at *Länder* level; that might cause the high correlation.

Furthermore, the correlation coefficient between the variables *Size* and *Social expenditure is very high*, as is that between *PP* and *Unemployment rate*. The high correlation between the variables *Size* and *Social expenditure* can be explained by the fact that, larger cities must carry these costs by themselves. Furthermore, social problems are more severe in metropolitan areas. As the variable of social expenditure is also correlated with the variables *Unemployment rate* and *Debt per capita*, both can already be considered measures for the economic condition of a municipality, and thus the variables should not be included in the regression at the same time.

The correlation between the variables *PP* and *Unemployment rate* can be explained by the fact that both variables are indicators for the economic environment in a municipality.

The political variables *Share SPD* and *Share Grüne* do not have problematically high correlation coefficients with any of the other variables. However, it is interesting to notice that *Share Grüne* has a higher coefficient with the variables *Service sector*, *PP* and *Communalisation rate,* which are all indicators for more urban municipalities or cities. On the other hand, the coefficient of the variable *Primary sector* is in fact negative, whilst it is positive between *Share SPD* and *Primary sector*. As high correlation coefficients do not necessarily imply multicollinearity, additional statistics such as the variance inflation factors (VIF), the tolerance values, the eigenvalues and condition numbers are presented in table 18. Table 18 shows diagnostics for a model that would contain all

the independent variables. Table 19 shows the multicollinearity diagnostics for estimations of *model 12*.

VIF measures the inflation of the variance associated with each variable in the presence of multi-collinearity. Commonly, VIF smaller than 10 mean that multicollinearity is not a problem (Neter et al. 1985). A tolerance around 1 indicated a small degree of multicollinearity in the model. A tolerance value close to 0 suggests that multicollinearity can cause problems (O´Brien 2007). The VIF values for the variables in the full model are all smaller than 10, and thus in a range where multicollinearity among the variables does not seem to cause problems. Furthermore, the tolerance factors are not smaller than 0.1 and therefore do not give rise to worry.

However, the values of the eigenvalues and condition numbers indicate that multicollinearity might cause some problems. Typically, a condition number greater than 30 indicates that the regression coefficients are very unstable (Belsely et al. 1980, Belsely 1991). The condition number for the multicollinearity test of a model with all independent variables has a very large value of 97.85. Moreover, some of the eigenvalues are smaller than 0.01. That is likely because many of the variables measure the same concept, as in the case of the variables *PP*, *Unemployment rate* and *Primary sector* all measuring the economic environment of a municipality. These variables also have eigenvalues of zero or close to zero, which means that these variables contribute little or nothing to explain the variance in the full model specification. Therefore, some of the variables measure the same factors on PB adoption; they are thus redundant and should not be included in the model.

Table 18: Collinearity Diagnostics for Full Model

Variable	VIF	Tolerance	R squared	Eigenvalue	Condition index
Debt per capita	2.03	0.5	0.5	1.78	2.23
Short-term lendings per capita	1.87	0.5	0.5	1.02	2.47
Fiscal	1.04	0.97	0.03	0.87	3.27
Election	1.39	0.7	0.28	0.79	3.55
Election 2	1.33	0.7	0.25	0.66	3.71
Size	2.32	0.4	0.6	0.5	4.07
Service sector	1.18	0.8	0.15	0.32	4.67
Migration	1.84	0.5	0.46	0.29	5.86
Constitution type	1.93	0.5	0.41	0.28	6.15
Communalisation rate	2.21	0.5	0.5	0.2	7.3
Proximity effect	2.61	0.4	0.62	0.16	8.17
Unemployment rate	2.56	0.4	0.6	0.09	10.8
PP	2.41	0.4	0.6	0.08	11.34
Primary sector	1.08	0.92	0.08	0.05	14.22
Social expenditure	2.26	1.5	0.58	0.009	35.27
Share SPD	1.26	0.8	0.21	0.004	51.63
Share Grüne	1.44	0.7	0.31	0.001	97.58
Mean VIF	1.81				
Condition Number	97.58				

Source: Own calculations.

Table 19: Collinearity Diagnostics for Model 12

Variable	VIF	Tolerance	R squared	Eigenvalue	Condition index
Debt per capita	1.23	0.82	0.18	1.03	2.47
Fiscal	1.02	0.98	0.02	0.85	2.72
Election	1.32	0.76	0.24	0.56	3.35
Election 2	1.3	0.77	0.23	0.47	3.65
Size	1.42	0.71	0.3	0.33	4.37
Service sector	1.09	0.92	0.08	0.21	5.46
Proximity effect	1.16	0.86	0.14	0.14	6.62
Share SPD	1.14	0.88	0.12	0.09	8.31
Share Grüne	1.08	0.93	0.07	0.05	11.36
Mean VIF	1.19				
Condition Number	11.3644				

Source: Own calculations.

Table 18 shows that the condition number for the regression in *model 12* is much lower than the one for a model with all independent variables. It is much lower than 30 and the eigenvalues are larger compared to the model with more variables. That indicates that multicollinearity does not seem to cause issues in model specification 12.

Model specification

In GEEs, the response variables are generally not independent. Accordingly, neither are the residuals. Thus, likelihood-based methods and measures of model goodness used for linear regression have to be accustomed. This requires making certain assumptions about the correlation of the data. One method for selecting the best correlation structure and the best subset of explanatory variables is the quasilikelihood under the independence model information criterion (QIC) developed by Pan (2001). It extended the Akaike information criterion (AIC), which is a commonly used tool to measure the goodness of fit for the selection of likelihood-based models, to allow comparison of covariance matrices under GEE models with the covariance matrix generated from a model that assumes no correlation within clusters (Barnhart/Williamson 1998, Zorn 2001).

For cases in which there is no clear theoretical indicator for which correlation structure would be the best, the QIC criterion can be used. The correlation structure with the QIC score that is lowest (closest to zero) is judged to be the best (Hardin/Hilbe, 2013, pp 163).

Table 20 shows the QIC measure values of the full logistic regression model (*model 12*, table 16) for different working correlation matrix specifications.

Table 20: QIC Statistics for Different Working Correlation Matrix Specifications

Correlation	QIC
Autoregressive	1548.653
Unstructured	No convergence
Exchangeable	1533.001
Independent	1568.667

Source: Own calculations.

The QIC values for the *model 12* specifications with different correlation structures are very close to each other. The *exchangeable* correlation structure has the lowest QIC value and thus seems to fit the data the most accurately. The *autoregressive* correlation structure has the second lowest QIC value and thus would also fit the data well. An unstructured correlations matrix does not converge in that specification. As the QIC values are very close to each other, the logistic regression results should not be too different when estimated with different correlation structures. To test that, the regression model will be estimated with different correlation structures.

The QIC_U criterion is used to decide which variables to include in the model. QIC_U approaches QIC when the GEE model is specified fittingly. QIC_U adds a penalty (2p) to the quasilikelihood

(Q), where p is the number of parameters in the model. In choosing between different models, the model with the smallest QIC_U criterion measure is preferred" (Hardin/ Hilbe, 2013, p. 170). Table 5.17 shows values of the QIC_U criterion for the different explanatory variables. It shows the values for models, only containing one explanatory variable at a time for each of the main effects that influence the probability to adopt PB, and also for a model that includes all the four variables. As the logistic regression results of the interaction term between the variables *debt per capita* and the *size* are ambiguous, QIC_U values are calculated for a full model with and without the interaction term.

Table 21: QIC$_U$ Measures for Different Models

Model	QIC$_U$
Debt per capita	2402.566
Size	2985.402
Service sector	3633.07
Proximity	8027.633
Full model with interaction effect	1926.788
Full model without interaction effect	1875.487

Source: Own calculations.

The model specification covering all variables that are theoretically relevant has the lowest QIC_U criterion value and thus seems to be the preferable model. On the other hand, the model without the interaction term has a slightly lower QIC_U criterion and thus suggests that the model without is a better fit.

A Wald test is run to test if the main explanatory variables are simultaneously equal to zero. Based on the p-value, the null hypothesis that the variables are equal to zero can be rejected (see table 22). This suggests that including these variables substantially improves the fit of the model (Hardin/Hilbe 2013, pp. 204-205).

Table 22: Wald Test of Coefficients

| Wald test |
|---|
| (1) Debt per capita = 0 |
| (2) Fiscal = 0 |
| (3) Size = 0 |
| (4) Proximity= 0 |
| (5) Service sector = 0 |
| (6) Interaction = 0 |
| (7) Interaction = 0 |
| Chi2(4) = 291.86 |
| Prob > chi2 = 0.0000 |

Source: Own calculations.

To further check if the selected model adequately fits the data, a residual analysis is done, (Hardin/ Hilbe 2013, pp. 172). As a first step, a residual plot is shown in figure 5.4.

The residuals were calculated as the difference between the observed and predicted values. A Lowess line is also added to the graph to help in assessing the distribution of the residuals.

Figure 28: Residuals versus Fitted Values
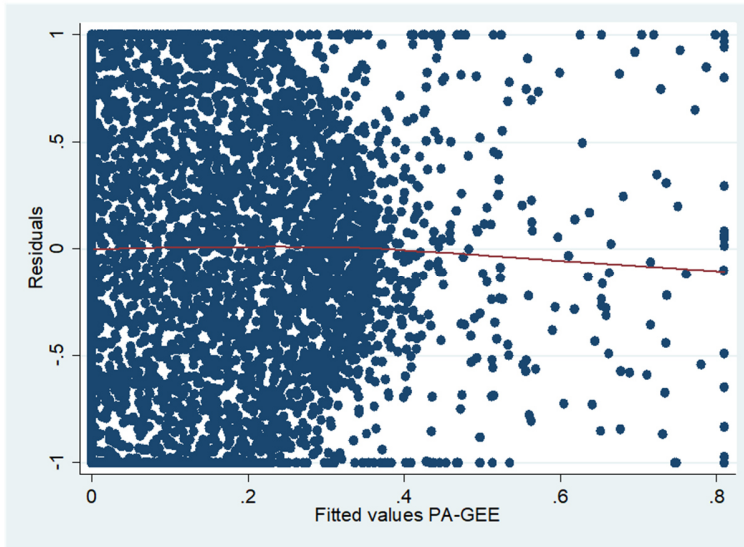
Source: Own calculation.

Figure 28 shows that the residuals are randomly distributed around the zero line. The horizontal course of the Lowess line suggests that the variances of the residuals are equal. There is no residual that seems to stand out from the basic random pattern of residuals. This suggests that there are no outliers. There is a clustering of residuals between the probability of 0 and 0.5. However, this is not because the residuals do not follow a random distribution; instead it is because there are much fewer cases with events coded 1 compared to cases without events coded 0. Therefore, it can be concluded that the residual plot does not suggest that the residuals follow any trend or non-linear pattern.[39]

In summary, the diagnostics statistics show that the model adequately fits the data.

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[39] To check for the correct functional form of the explanatory variables, in addition to the residual plots, Lowess lines for the variables *Debt per capita*, *Service sector* and *Proximity effect* and PB were calculated. The graphs suggest that the relationships between the dependent variable and the explanatory variables are sufficiently linear. Results can be obtained from the author.

5.3.4 Robustness Test

To test for robustness of the results, regression analyses are performed with different methods estimating the influence of the independent variables *Debt per capita, Size, Service sector* and *Proximity* on PB adoption.

Table 23 shows the regression results of the model estimated with different methods. *Model 1* shows the results of a simple logistic regression analysis, accounting for clustered data and applying robust standard errors. In the second to fourth columns of the table, the results of population-averaged models with different correlations matrices are shown, in this order: exchangeable, autoregressive, unstructured; all with robust standard errors are included. The fifth column shows the results obtained from an estimation of a random-effect model.

Table 23: Regression Results Robustness Tests

	(1) Logit	(2) PA exchangeable	(3) PA autoregressive	(4) PA unstructured	(5) RE
Debt per capita	0.169** (2.41)	0.159*** (2.90)	0.166*** (2.68)	0.107** (2.04)	0.624*** (2.90)
Fiscal	-0.681 (-1.43)	-0.799** (-2.46)	-0.614** (-2.11)	-0.392 (-0.79)	-2.064* (-1.95)
Medium-sized city	1.704*** (5.78)	1.529*** (5.89)	1.477*** (5.01)	1.410*** (4.77)	5.435*** (6.91)
Large city	3.114*** (7.07)	2.980*** (7.98)	2.824*** (6.78)	3.019*** (7.97)	12.392*** (8.26)
Proximity	0.095*** (6.13)	0.115*** (10.48)	0.111*** (9.04)	0.111*** (8.98)	0.524*** (11.65)
Service sector	0.239 (1.43)	0.362*** (3.31)	0.344*** (2.74)	0.398*** (4.09)	1.453*** (2.94)
_cons	-5.275*** (-19.21)	-5.313*** (-21.23)	-5.321*** (-19.46)	-5.194*** (-21.46)	-22.552*** (-21.77)
N	6374	6374	4911	6374	6374

Source: Own calculations.

The results show that the effect of the variable *Debt per capita* remains significant throughout different regression methods at the 1 or 5 percent level. The variable *Fiscal* is only significant in *models 2* and *3* in these cases; it is also only significant at 5 or 10 percent level. Thus, the variable *Debt per capita* is the more robust proxy variable for the fiscal situation of a municipality.

The variables *Size* and *Proximity* are significant and have the expected signs in all models.

The variable *Service sector* is significant and has the expected sign in all model specifications; it is only insignificant when tested with a logit model.

In the random-effects model, the coefficients of all variables are significantly larger than in the other models. That is because of the way random effects are calculated. Largely, coefficients from such a subject-specific model (SS model) are related to the population-averaged coefficients (PA model) by the subsequent equation:"

$$\beta^{PA} = \sqrt{\frac{3.29}{3.29 + \sigma_\mu^2}} \, \beta^{SS}$$

where σ_μ^2 is the between-subject or random effect variance from the SS model and 3.29 is the variance of a standard logistic model. The term under the square root is the proportion of the variance that is not explained by the independent variables for the SS model relative to the PA model. If there is no between-subject variation, the PA and SS coefficients are the same. The greater the between-subject variation, the greater the SS coefficient is compared to the PA coefficient" (Szmaragd et al. 2013, p.155). The regression results in table 5.19 show that for most variables the coefficients obtained from the SS model are much larger than those from the PA model. This again suggests that there is a bigger difference in values between the observations in the dataset than between the successive observations of one municipality.

Therefore, this comparison of results from different estimation methods confirms the choice of a PA model as an adequate method. Regarding theory, QIC statistics and Tjur R2, models estimated with a PA GEE model using an autoregressive or exchangeable correlation structure both sufficiently fit the data.

To test if not only the observations originating from one municipality but also the observation of municipalities located in the same *Land* are correlated, a three-level model is run. In such a model, repeated observations are nested within municipalities and municipalities are nested within *Länder*. The regression results in table 24 show that the correlation between the latent-responses of two municipalities located in the same *Land* is 0.08 (2.56/ (2.56 +27.74), while

the correlation between the repeated observations of one municipality is 0.92. That suggests a low correlation between the observations of different municipalities in the same *Land* and shows that it is not necessary to model the correlation in a three-level model (Braun et al. 2010, p.31).

Table 24: Results of a Three-Level Model

Fixed part	OR	Std. error	P>z
_con	-15.14	1.92	0.000
Debt per capita	0.14	0.08	0.099
Fiscal	-1.8	0.9	0.047
Medium-sized city	5.43	1.16	0.000
Large city	10.99	2.06	0.000
Proximity	0.54	0.1	0.000
Service sector	0.51	0.95	0.340
Random part			
var 1 (municipal level)	27.74		
var 2 (Länder level)	2.56		
Log likelihood	-589.46725		

Source: Own calculations.

These results once again support the choice of a PA model as the appropriate estimation method. The differences between the municipalities are greater than the differences within a single municipality over time.

In conclusion, the robustness tests have shown that estimation using different methods does not contradict the result that the fiscal situation, the size, the number of other municipalities adopting PB, and the innovative climate influence the probability of a municipality adopting a PB process.

Thus, even if the PA model was not the correct choice of model for the data the results are still likely to be significant, and therefore general assumptions around the factors that influence the consideration or adoption of PB in Germany can be drawn.

5.4 Factors Influencing Different Phases of PB Adoption

This section explores how the factors based on the theoretical discussion in Chapter 4 influence different stages of PB adoption. Section 5.4.1 explain the methodology of the ordered logistic

regression performed and presents the results. Section 5.4.2. discusses the fit of the model by employing diagnostic tests.

5.4.1 Results of an Ordered Logistic Regression Analysis

This section presents the results of an ordered logistic regression. Table 25 shows the number of PB processes in the different stages of its adoption for the pooled dataset covering the years 2008 to 2014. The stages range from "no PB" through "pre-form", "introduction", "continued" to "abandoned" (Ermert et al. 2015). The highest share of PB municipalities can be found in the stage "pre-form". Municipalities in that stage have handed out information about PB to citizens, discussed the introduction or/ and decided to introduce PB in the future or already have a pre-form of PB in place. The higher the level of the PB stage, the smaller is the share of municipalities in that category.

Even though there are also municipalities that abandon PB, the share of municipalities in the "abandoned"-stage is smaller than the share of municipalities that are categorized as "continued". Municipalities in that stage have applied PB for a minimum of two years

Table 25: PB by Stage of Adoption

PB category	Freq.	Percent
No PB	19,441	73.20
Pre-form	692	2.61
Introduction	293	1.10
Continued	121	0.46
Abandoned	110	0.41
Missing	5,902	22.22
Total	26,559	100.00

Source: Own calculations.

An ordered logistic regression is applied to measure the effect of independent variables on the likelihood of being in one of the defined stages of PB adoption. It is performed for the year 2011 as this is the year with most yes-cases for PB and also is a year for which data on explanatory variables is available.

Ordered Logistic Regression is a specific type of logistic regression which can be used if the dependent variable is ordered, which means that it has two or more properties. For each category of the dependent variable a regression model is calculated and the probability of occurrence for each category in relation to the independent variables is calculated (Wooldridge 2010). An important pre-condition for using an ordered logistic regression is to meet the assumption that slopes for different sizes of the dependent variable are parallel. Even though it is not known if the distances between the five categories from no-PB to abandonment are the same, they can be put in a clear hierarchical order from no PB through "pre-form", "introduction", "continuation" to "abandonment". To progress to the next stage of the process, the previous stage has to be completed. Under the assumptions of parallel slopes, an ordered logistic model is employed. A Brant test of parallel regression assumption confirms that assumption (see section on diagnostics). The main explanatory variables *Debt per capita, Size, Service sector,* and *Proximity* are included in the model. Table 26 presents the regression results.

Table 26: Results of an Ordered Logistic Regression

Variable	Coefficient	z
Debt per capita 1000	0.1***	(2.60)
Medium city	1.8***	(6.96)
Large city	3***	(7.53)
Proximity	0.06***	(4.25)
Service sector	0.35**	(2.34)
cut1	4.59***	
cut2	5.84***	
cut3	7.43***	
cut4	8.15***	
N	1591	

Exponentiated coefficients; *t* statistics in parentheses

* $p<0.10$, ** $p<0.05$, *** $p<0.010$

Source: Own calculation.

These results show that the coefficients of the independent variables included in the analysis are significant and have the expected positive signs in an ordered logistic regression. Hence, the results of an ordered logistic regression confirm that if the debt per capita rises, the probability of PB adoption increases. The same applies with regards to increases in size, in share of the service sector and in the number of municipalities in geographic proximity already employing PB process.

The results shown in table 27 cannot be directly interpreted as revealing how the probabilities for the different categories of PB adoption change with different levels of the independent variables. Instead, one way to arrive at these estimates is to calculate average marginal effects of the independent variables for different categories. These are displayed in table 26.

Table 27: Average Marginal Effects

	(1) Pre-form	(2) Introduction	(3) Continuation	(4) Abandonment
Debt per capita	0.00496** (2.56)	0.00284** (2.50)	0.000501* (1.82)	0.000533* (1.80)
Medium-sized city	0.0635*** (6.17)	0.0364*** (4.85)	0.00642** (2.37)	0.00683** (2.39)
Large city	0.104*** (6.76)	0.0595*** (5.35)	0.0105** (2.40)	0.0112** (2.40)
Proximity	0.00195*** (4.12)	0.00112*** (3.71)	0.000197** (2.17)	0.000210** (2.17)
Service sector	0.0122** (2.32)	0.00701** (2.23)	0.00124* (1.71)	0.00131* (1.72)
N	1591	1591	1591	1591

Source: Own calculations.
Marginal effects; t statistics in parentheses
* $p<0.10$, ** $p<0.05$, *** $p<0.010$

All independent variables are significant and have the expected positive coefficients. The coefficient for the variable *Debt per capita* is higher for the categories "pre-form" and "adoption" of PB compared to the stages "continuation" and "abandonment". For the latter stage, it is only significant at 10 percent level, while it is significant at 1 percent level for the first two categories. The same applies to the variables *Size, Service sector* and *Proximity*.

The average marginal effect for the variable *Debt per capita* under a change from no PB to pre-form is positive with a value of 0.005. That means that the probability to have a pre-form of PB increases when the variable *Debt per capita* rises in a municipality.

The average marginal effect gets smaller the higher the category of PB adoption is, up until the stage *Continuation*. The marginal effect of the variable *Debt per capita* for municipalities that abandon PB is slightly larger again.

The probability to have a pre-form of PB also increases when a municipality is characterized as a medium-sized or large city compared to a small city. The size effect gets smaller in magnitude with higher categories of PB adoption.

Furthermore, the probability to have a pre-form of PB increases if there are more municipalities in a *Land* that employ PB. The increase of probability gets smaller with higher categories.

The same effect is found for the variable *Service sector*. The probability to adopt a PB process increases if the share of the service sector is larger. This effect gets smaller with higher categories of PB adoption.

The average marginal effects for the category "continuation" are the smallest among the categories for all variables. That could be the case because other factors not included in the model are more important for the decision to continue a PB process. One of these factors is likely to be the participation rate in the PB process. However, these variables cannot be included in the estimation due to the lack of data.

The relatively small numbers for all the average marginal effects is due to the fact that most municipalities in the sample do not have a PB, the marginal effects are relatively small. Therefore, in addition to the marginal effects, probabilities are calculated for selected values of the independent variables.

To calculate the probabilities for higher values of the selected variables in the dataset, the 95th percentile values were chosen. Five percent of the municipalities in the sample have a *Debt per capita* equal to or larger than 4,644 euros. Five percent of the municipalities in the sample are located in *Länder* in which a share of 17 percent or more of municipalities employ PB processes. In 5 percent of municipalities within the sample, the share of the service sector in the municipal economy is equal to or larger than 20.4 percent. Table 28 shows the probabilities for the 95th percentile values.

Table 28: Probabilities for 95th Percentile Values

Different categories	Probability	Confidence interval
Pr(y=no PB):	0.32	[0.1996, 0.4382]
Pr(y=pre-form):	0.30	[0.2422, 0.3625]
Pr(y=introduction):	0.27	[0.1754, 0.3645]
Pr(y=continuation):	0.05	[0.0083, 0.0988]
Pr(y=abandonment):	0.06	[0.0082, 0.1077]

Source: Own calculations.

Among the municipalities in the dataset with these or larger values for the chosen independent variables, the probability to have a pre-form of PB is 30 percent. The probability to introduce PB is 27 percent. The probability to continue PB is 5 percent and to abandon PB is 6 percent.

High levels of debt, a relatively high number of PB processes in the neighbourhood and a relatively large service sector influence municipality to have a pre-form of a PB process or to introduce a PB process. Here again it seems that other explanatory factors are more important for the decision to continue or abandon a PB process.

Analogously to the above, probabilities were calculated for values at the 25th percentile. The corresponding values are: 590 Euros for the variable *Debt per capita*; 0.09 percent for the variable *Proximity* and 2.4 percent for the variable *Service sector*.

Table 29: Probabilities for 25th Percentile Values

Different categories	Probability	Confidence interval
Pr(y=no PB):	0.98	[0.9678, 0.9869]
Pr(y=pre-form):	0.02	[0.0092, 0.0230]
Pr(y=introduction):	0.0052	[0.0025, 0.0079]
Pr(y=continuation):	0.0007	[0.0001, 0.0013]
Pr(y=abandonment):	0.0007	[0.0001, 0.0013]

Source: Own calculations.

According to table 29, among the observations included in the 25th percentile 98 percent do not have any form of PB. The probability of having a pre-form is very low, with a value of 0.2 percent. The probabilities for introducing, continuing or abandoning a PB process are even smaller.

This comparison shows that municipalities with values of the independent variables at or above the 95th percentile values have much larger chances to adopt PB than those at or under the 25th percentile values.

Thus, the ordered logistic regression confirms the finding from the theoretical discussion in Chapter 4: that the fiscal situation, the size, the innovation climate of municipalities and the proximity to other municipalities using PB all positively influence the probability to implement PB. An additional finding of the ordered logistic regression is that the effect of the relevant explanatory variables seems to be stronger for municipalities that apply a pre-form of PB and their influence gets smaller for latter stages of PB adoption, such as "introduction" or "continuation". More especially for municipalities that continue PB processes, other factors seem to play a more important role in the decision of whether to keep a PB process once it has been introduced.

5.4.2 Diagnostics

To test the fit of the ordered logistic regression model, measures of fit are discussed in this section. First a Wald test is conducted, to test whether the effects of the independent variables are in fact simultaneously equal to zero (table 30) (Long/ Freese 2014, p.323).

Table 30: Wald Test Coefficients

(1) Debt per capita = 0
(2) Medium-sized city = 0
(3) Large city = 0
(4) Proximity = 0
(5) Service sector = 0
    chi2(5) = 192.94
   Prob > chi2 =   0.0000
Source: Own calculations.

The hypothesis that the effects of *Debt per capita, Size, Service sector* and *Proximity* are simultaneously equal to zero can be rejected at the 0.1 percent level (Long/ Freese 2014, p.323).

Table 31 shows several more measures to assess the fit of the ordered logistic model.

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Table 31: Measures of Fit for Ordered Logistic Regression Model

Measures of fit for ologit model	Values for model
Model:	ologit
N:	1591
Log-Lik Intercept Only	-590.617
Log-Lik Full Model	-466.820
D	933.639
LR	247.595
Prob > LR	0.000
McFadden's R2	0.21
McFadden's Adj R2	0.194
ML (Cox-Snell) R2	0.144
Cragg-Uh-ler(Nagelkerke) R2	0.28
McKelvey & Zavoina's R2	0.351
Variance of y*	5.068
Variance of error	3.290
Count R2	0.916
Adj Count R2	0.015
AIC	0.598
AIC*n	951.339
BIC	-10729.052
BIC'	-210.734
BIC used by Stata	999.988
AIC used by Stata	951.639

Source: Own calculations.

The BIC and AIC and the LR chi-square test of all coefficients do not suggest that the independent coefficients are combined equal to zero. The pseudo R² indicate a satisfying fit of the model.

Furthermore, the assumption of parallel slopes, on which the ordered logistic model is based, is tested statistically with the Brant Test. Table 32 shows the results of this test.

Table 32: Brant Test of Parallel Regression Assumption

Variable	chi2	p>chi2	df
All	17.96	0.265	15
Debt per capita	5.94	0.115	3
Medium-sized city	5.26	0.154	3
Large city	4.38	0.223	3
Proximity	5.56	0.135	3
Service sector	0.87	0.833	3

Source: Own calculations.

To test for the parallel slope assumption, probability values are interpreted. According to the results of the Brant test, the p-values are not significant and thus the assumption of parallel slopes can be accepted; hence the ordered logistic model is the proper model to use (Freese/ Long 2014, p. 330).

5.5 Chapter Summary

This chapter explored in terms of econometrics, the differences between various fiscal, economic, structural, political and demographic factors of municipalities that have or have not employed PB processes.

Section 5.1 introduced the dataset which is the basic for the econometric analyses. It consists of 2,951 municipalities covering the years 2008 and 2014.

In section 5.2, differences of municipalities with and without PB processes were analysed.

A cluster analysis was employed, ultimately demonstrating that the data can be divided into two clusters: one cluster in which municipalities have employed PB and another in which municipalities have not. The cluster of the municipalities that have had PB processes is characterized by higher levels of debt, higher levels of social expenditure and larger population sizes compared to the cluster of municipalities that have not used PB. The mean value comparisons with t-tests support the arguments, developed based on economic theories in Chapter 4, that the fiscal situation, the institutional setting, the socio-economic pre-conditions and the size of a municipality as well as proximity to other municipalities influence PB adoption. The comparison of means does not give a clear picture about the direction of the relationship between political party and PB adoption. Other demographic variables besides population size do not have significantly different mean values for municipalities with and without PB.

Section 5.3 analyses which factors influence PB adoption by employing a logistic regression. The results of the logistic regression imply the acceptance of *hypothesis 1,* claiming that the financial situation of a municipality has a strong influence on PB adoption. The results show that the more indebted a municipality is, the more likely it is to adopt a PB process.

Hypothesis 2, suggesting that upcoming elections increase the likelihood of PB adoption, cannot be confirmed. The coefficients of the variables for testing this hypothesis are not significant and do not have the expected signs. *Hypotheses 3* and *4* concerning the influence of the institutional design of a municipality on PB adoption cannot be confirmed either. Municipalities with local constitutions that grant more power to the mayor in relation to the local council are not more likely to adopt PB. Contrary to the stated hypothesis, the regression results suggest that municipalities with a constitution that grants relatively more power to the mayor are less likely to adopt PB. However, before concluding that an alternative hypothesis concerning the strength of the mayor and the probability of PB adoption is true, a regression model should be employed to test this effect with other proxy variables. Moreover, the communalization rate does not have

an influence on PB adoption. *Hypothesis 5*, which claims that the larger the share of seats of centre-left and left parties in the city council the higher is the chance of adopting PB is, is not confirmed. In line with findings in the literature, some left-wing parties push the adoption of PB processes; however, other studies have concluded that PB in Germany is not linked to the agenda of a particular party, since even municipalities with a CDU or FDP administration adopt PB programs.

Hypothesis 6, claiming that the socio-economic environment influences the likelihood for PB adoption, can be confirmed. A worse economic situation in a municipality (high unemployment and social expenditure) increases the likelihood of PB adoption. *Hypothesis 7,* that larger municipalities are more likely to adopt PB, can also be accepted. However, the regression results concerning the interaction term between debt and size are ambiguous. Therefore, *hypothesis 8*, that larger and more indebted municipalities are more likely to introduce PB, is not confirmed. It has a negative sign, however only for this category. In diagnostics tests, a better fit is given to the model without an interaction term. Thus, the interpretation should be taken with caution. It is likely that debt is one factor and size another, meaning that larger municipalities introduce PB independent of their indebtedness.

Additionally, the regression results support the hypothesis that an innovative climate in a municipality increases the probability of PB consideration or adoption. Thus *hypothesis 9*, which states that in municipalities with a higher share of innovators/entrepreneurs the probability of introducing PB increases, is confirmed. H*ypothesis 10*, that the probability that a municipality will adopt PB is positively related to the number of municipalities in a *Land* already employing PB, is also confirmed. Thus, proximity play a role in determining PB adoption.

The regression results remain robust throughout multiple robustness tests.

In section 5.4, factors that influence different stages of PB adoption among German municipalities were analysed. An ordered logistic regression was employed, where the likelihood of a municipality falling into the stages "pre-form", "introduction", "continuation" and "abandonment" of a PB process was calculated. As explanatory factors for different stages of PB adoption, the debt level, the population size, the climate for innovations and the proximity of other municipalities applying PB processes were all included in the analysis. These variables have a significant influence on the stages "pre-form" and "introduction". However, they are less suited to explaining why municipalities continue or abandon a PB process. Here, other factors such as the number of participants in the process might be important explanatory factors. This should be further explored in future research.

6. Conclusion and Outlook

In recent years, Germany has seen growing dissatisfaction with the political process, which has manifested in declining electoral turnout, especially at the municipal level. In an attempt to better to make public finance more transparent and to further citizen's participation, some municipalities have adopted "Participatory Budgeting" (PB), with around 100 municipalities in Germany currently employing some form of PB. During a PB process, citizens are invited to debate with municipal politicians and administrators about the use of municipal revenues and expenditures.

The major goal of this thesis is to identify and analyse those factors which lead to the adoption of PB from a public finance point of view. The results provide guidance on which factors to consider when implementing other innovations relevant for public finance.

To answer the main research question, a theory-guided analysis shows that factors which positively influence the probability to adopt a PB process are the financial situation of a municipality, the institutional setting, political factors, the socio-economic situation the size, the local climate for innovations and the number of other municipalities adopting PB. Thus, the hypotheses that were developed based on an analysis of Public Administration science, Fiscal Federalism theories, Public Choice theories and Diffusion of Political Innovations literature are confirmed.

Several sub-questions were answered in the different chapters; the main results of which are described in this conclusion. The resolution of these questions contributes to the closing of at least five research gaps. These are:

- **Research Gap 1:** There is no analysis of how PB processes are integrated in the existing system of municipal finances and the local budgeting process in Germany.
- **Research Gap 2:** There are no studies that apply theories from public finance as well as innovation studies to explain PB adoption.
- **Research Gap 3:** There is no study using cluster analysis and mean value comparison to describe differences in budgetary and economic variables between municipalities with and without PB.
- **Research Gap 4:** There is no study performing a logistic regression analysis to find out which factors have an influence on PB adoption in Germany.

- **Research Gap 5:** There is no study performing an ordered logistic regression analysing which factors lead to different stages of PB adoption like introduction or continuation.

In the second chapter, the author explains the important institutional background relevant to PB adoption. The role of municipalities in the federal system of Germany is presented and it is described how PB processes are integrated within the existing system of municipal finances and local budgeting. This chapter contributes to closing **Research Gap 1** on the way PB processes are integrated into the existing system of municipal finances and local budgeting in Germany. The analysis of the German federal system reveals that generally comprehensive self-governance rights are granted to the municipal level. However, in reality, the areas where municipalities can decide autonomously have been declining. Local councils can in fact only decide about a small part of the municipal budget whilst a by obligatory municipal tasks decided by the federal government. Furthermore, direct influence by the citizens in budgetary matters is in fact prohibited by law in all *Länder*. The traditional budgetary process does not foresee citizen participation. The budgetary process is very complex. Depending on the size of a municipality, the budget can contain between several hundred to several thousand pages. In addition, it contains a large number of special technical terms that are only used in the budget. In order to be able to extract information from it and interpret it, a sound knowledge of budgetary systematics, budgetary law and budgetary policy is necessary. As not even all members of the representative body of a municipality have this knowledge, citizens will rarely be able to understand the local budget. Thus, it takes great effort to let citizens participate in the budgetary process. The small share of tasks which the municipal level can decide about and the complexity of the budgetary process both present further obstacles to the adoption of PB in Germany and can help to explain the rather slow diffusion observed.

However, the potential of PB processes should also be noted. Most especially because the budgetary process is so complex and in its traditional form rarely comprehensible for citizens, PB programs can contribute to improving transparency. Public consultations are carried out at the same time as the budget is developed, discussed, and adopted, and citizens can make suggestions for changes in budget planning; in some cases, they can even vote for or against the proposals of others. This can reduce disillusion with politics. This effect would be even stronger if municipalities were equipped with sufficient fiscal autonomy. PB processes could then unleash more positive effects, be more attractive for citizens and lead to higher levels of citizen satisfaction with the political process.

In the third chapter, the author applies literature and document analysis to answer the question of what "Participatory Budgeting" is; how it has diffused globally and when and under which circumstances it was introduced in Germany. The historic origins of PB in Brazil are explained and its spread around the world is described in detail through a review of the relevant literature. To provide an overview of global PB processes, a categorization of PB processes into six ideal types is presented. Furthermore, the author analyses the background pertaining to PB adoption in Germany. This analysis shows that PB adoption in Germany can be linked to extensive reform efforts in the public sector at the municipal level, which took place in the 1990s. Reform policies in accordance with the principles of the New Public Management approach were introduced with the objective to increase efficiency by making public administration more business-like. This also included initiatives for more citizen participation. As a result, citizens' petitions and referendums were introduced in all *Länder* at the municipal level. Participation was taken one step further by the model of the *Bürgerkommune*. This concept complements the output-oriented, economic reforms of the New Public Management approach with input-oriented instruments of cooperative democracy and pursues the goal of bringing about a comprehensive change in the way stakeholders interact at the municipal level. This includes the implementation of consultative participatory procedures such as round tables, civic forums, mediation procedures and planning cells. The adoption of PB processes falls within these reform efforts. They were introduced as an addition to the representative democracy and thus, in contrast to countries where PB processes are an instrument of direct democracy, in Germany they have a predominantly consultative character, with outcomes that are not legally binding. The goals of PB are primarily to inform citizens about a municipality´s finances and thus increase transparency, as well as to further citizens' interest in municipal politics. Regarding the process design, a three-stage procedure has evolved consisting of the stages termed "information", "consultation" and "accountability".

Furthermore, the author analyses the scholarly literature of PB to assess which theoretical approaches and which research methods have been used, and to identify the existing research gaps.

This literature review reveals a wide variety of methods for studying PB. The majority of the literature analyses theoretical reasons behind the diffusion of PB across local governments within a country or within Latin America, or else analyses the global diffusion of the program using qualitative methods. There are few contributions that use logistic regression analysis to estimate the probability that a municipality adopts PB based on electoral, economic, regional,

and policy network variables. The literature of PB in Germany consists largely of single case studies evaluating PB processes in certain municipalities or cities. These studies rely mostly on qualitative research methods like expert interviews, surveys and the examination of documents related to the process. While these studies provide in-depth analysis of single processes and allow best practice cases to be identified, they provide few general conclusions regarding the design, adoption or impact of PB processes. There are just two in-depth studies using quantitative data methods that focus on the policy effects of PB, and on the factors that influence participation in PB processes in Germany. Most studies focus on the analysis of PB from a political science point of view. The goal of this dissertation is to add to the PB literature by analyzing PB adoption from an economic point of view. Thus, in the fourth chapter of the thesis, US public administration research, fiscal federalism, public choice theory, and the literature on diffusion of political innovations are together used to explain PB adoption in Germany. The findings of this chapter contribute to filling **Research Gap 2**. There are some arguments in favour of PB adoption as a means to improve economic welfare from a fiscal federalism point of view. A PB process gives citizens an institutional forum to express their preferences and public goods and service provision could thus be improved. Furthermore, it has the potential to create fiscal equivalency and thus lead to sounder public finances and more awareness around the costs and benefits of public services. However, considering the fiscal federal system of Germany, the effect will be limited due to the level of institutional incongruence. Furthermore, individual politicians may not have an incentive to change the status quo as this already allows them to shift some of their financial responsibility to other governmental levels.

One explanation of why individual politicians may have incentives to adopt a PB process is that they see it as an instrument to inform the public when the municipality is in financial crisis and major budget cuts are about to happen. In this way, politicians might gain understanding from the citizens for budget cuts and at the same time become more popular by letting them participate in the budgetary process – thus decreasing their own risk of being punished at the next election. Furthermore, painful budget cuts and reductions to public services are inevitable in such a situation and so engaging citizens at an early state will make the implementation of these cutbacks easier. This also provides an explanation for why more highly indebted municipalities are more likely to adopt PB.

If a far-reaching diffusion of PB is desired, the adoption of PB processes may have to be made mandatory. Despite the finding that from an overall economic viewpoint PB processes have the potential to create benefits such as better financial literacy, transparency and accountability,

there is no incentive structure for institutionalising the adoption of PB processes under the current fiscal system.

In the fifth chapter, the author presents the findings of econometric studies from a cluster analysis, from mean value comparisons with t-tests, from a logistic regression with a population-averaged model suitable for panel data analysis, and from an ordered logistic regression using a unique panel dataset consisting of 2,951 German municipalities having more than 5,000 inhabitants in the period 2008 to 2014. Thus, this chapter contributes to filling **Research Gaps 3, 4 and 5.**

The cluster analysis reveals that the dataset can be clustered into one group of municipalities that adopt PB and another group of municipalities that do not adopt PB. Therefore, it can be assumed that there are systematic differences between municipalities with PB and municipalities without PB with regard to the chosen variables. The values for variables such as population and debt balance as well as staff and social expenditure are much higher for municipalities with PB compared to those without. This supports the hypothesis that the financial situation of a municipality has an important influence on the likelihood of PB adoption. Besides, the results of the bivariate analysis suggest that municipalities that consider or apply PB are larger-sized municipalities. Important differences are seen, especially in the fiscal situation of a municipality. Municipalities with PB have on average significantly higher debt levels than those that do not apply PB. They are furthermore characterized by a more problematic economic and social situation and have much higher social and HR expenditures than the group of no-PB municipalities. On the other hand, mean values considering other demographic situations hardly vary. Furthermore, a logistic regression with a population-averaged model suitable for panel data analysis is used to explain which factors lead to PB adoption in Germany. This regression reveals whether the factors that were identified as influential in the theoretical discussion in fact have an influence on PB adoption and, if so, whether they have a positive or negative affect on the decision to adopt PB. The most important results of the logistic regression are that the debt level, the size of a municipality, the number of other municipalities adopting PB and the innovative climate all positively influence the probability that the municipality in question will adopt a PB process. These results remain robust when tested with alternative proxy variables. They confirm the theoretical arguments from Public Administration science, Fiscal Federalism theories, Public Choice theories and Diffusion of Political Innovations literature. Moreover, an ordered logistic regression is applied to analyse which factors influence different stages of PB adoption – namely no PB, pre-form, introduction, continuation, or abandonment. The results of

the ordered logistic regression show once again that the fiscal situation, the population size, the innovative climate and the proximity to other municipalities employing PB have a significant impact on the different stages of PB adoption. However, the impact of these factors is stronger for municipalities that apply a pre-form of PB and their influence gets smaller for those later stages of PB adoption such as introduction or continuation. More especially, for municipalities that continue PB processes, other factors seem to play a more important role in the decision to retain a PB process once it has been introduced.

This thesis has made an important contribution to research by shedding light on PB adoption from an economic point of view, and by filling the numerous research gaps in this field. It provides starting points for further research.

Outlook & Limitations

The research presented in this thesis contributed to filling important research gaps. The econometric analyses allowed conclusions to be drawn regarding which municipalities are more likely to adopt PB. Future research could continue this line of investigation and analyse in more detail the motivation of individual politicians by supplementing the dataset using interviews and or surveys with local politician/experts. Thus individual factors such as education, professional experience, gender or length of mayoral tenure, could be surveyed at the municipal level, and the relationship between these factors and the willingness to adopt political innovations could be tested.

Furthermore, future research might explore in greater detail the connection between different institutional designs and the decision to adopt a political innovation such as PB. The regression in this thesis contained a variable in the form of an index that combined several institutional characteristics. One factor that would be interesting to test with regard to PB processes is the usage of other direct democratic instruments – such as referenda and petitions. Here, the correlation between the number of successful referenda and petitions and the adoption of PB processes could be measured. Furthermore, it could be assessed how citizen-friendly regulations are, in terms of signature hurdles and approval quotas. These vary greatly from *Land* to *Land*. In Thuringia, 6-7 percent of voters must sign a petition for it to become valid. In North Rhine-Westphalia, smaller municipalities need to get signatures of 10 percent of voters while larger

municipalities need to reach 3 percent of eligible voters. In Saarland, Saxony and Saxony-Anhalt regulations are most restrictive, as between 5 and 15 percent of eligible voters must sign a petition for it to be valid (Bogumil/ Holtkamp 2013, p. 34). Here it would be interesting to investigate whether more citizen-friendly rules increase the likelihood of introducing PB; that is, whether PB processes are substitutes to other forms of direct participation, or whether they are instead complementary.

Furthermore, it could be investigated whether the specific election system has an impact on the adoption of PB processes. Whilst the direct election of the mayor has been adopted nationwide, regulations regarding term of office, ineligibility and election system vary between the *Länder*. For example, the term of office is 6 years in Bavaria, Hesse, North Rhine Westphalia and Thuringia, but is 7 or 8 years in Baden-Württemberg, Brandenburg, Lower Saxony and Rhineland. In Saarland, the term of office is 10 years (Bogumil/ Holtkamp 2013, p. 32). One approach would be to analyse whether the length of the election period has an influence on the willingness to adopt PB; in theory mayors that remain longer in office could have more power to push through an innovation such as PB, or conversely mayors that face shorter periods in office might be more likely to adopt them in order to gain advantage over political competitors.

This thesis contains data for the years around 2013, when the peak number of PB processes in Germany was attained. In the years since, municipalities still adopted PB processes, but motives for adoption may have changed. Thus, the model developed in this thesis could be tested with more recent data. In addition, it could be investigated whether newer institutional innovations such as debt brakes, that have been in effect only since 2020, have an influence on PB adoption. Another point for future research is to further analyse adoption, abandonment, continuation, and re-adoption of PB processes separately. This will allow a more detailed understanding of the motives for PB adoption. The results of the ordered logistic regression show that the factors that explain discussion and first adoption of PB are less suitable for explaining the continuation and abandonment of PB processes. Factors which impact on the decisions to abandon or continue a process could be tested. These factors may be, for example, participation rates and the quality of proposals brought up during the process, as well as whether a PB process is ultimately considered successful. Here, additionally, a discussion of what constitutes a successful process would be necessary.

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Appendix

Table A.1: List of Variables

Variables	Description	Calculation	Data Sources
Dependent Variable			
PB	The variable indicates whether a municipality does or does not adopt a PB process in the given year.	Dummy variable with 1 =PB 0 = no PB	Own research (websites, official documents, publications)
Independent Variables (cluster analysis, t-tests, logistic regression analyses), sorted alphabetically			
Assets balance	In year z, the municipality closed its asset and property acquisitions per inhabitant with a surplus/deficit of y euros (income minus expenditure).*	Income from asset sales - expenditure from asset purchases (Grp.-Nr.[40] 33 - 932 + 340 - 930) / Inhabitants; Doppik: Kto.[41] 6821 - 7821 + 684 – 784*	Statistische Ämter der Länder
Average age	Provides information on the ageing of the municipality's population.*	Sum of all ages divided by the number of persons in the municipality (arithmetic mean of the ages)*	Statistische Ämter der Länder
Communalisation rate	The communalisation rate describes the ratio in which tasks are distributed between a *Land* and its municipalities.	Expenditure of municipalities in one *Land*/ Total expenditures of the *Länder*	Statistische Ämter der Länder
Constitution type	This variable measures the differences in balances of power between the mayor and the city council based on different municipal constitutions.	A scale that shows if a municipality can rather be characterized as a consensual or competitive democracy. The scale ranges from 12 to 20 and is measured on *Länder* level since the *Länder* define the municipal constitutions.	Bogumil and Holtkamp 2013, p. 39.
Debt change (%)	The total debt per capita of municipality x has changed by y % compared with the previous year.*	(Total debt per capita in year z / Total debt per capita in year z-1) * 100 – 100*	Statistische Ämter der Länder
Debt per capita	In year z, the municipality x had debts and liabilities from loans per inhabitant amounting to y euros.*	Core budgets (debt + short-term loans+ quasi-credit transactions (kreditähnliche Rechtsgeschäfte) + debt of municipal companies + credit debt of companies - internal debt to owners / Inhabitants * Note: In regression analysis multiplied by 1000, as one euro changes little in the probability of PB adoption.	Statistische Ämter der Länder

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[40] The grouping plan number (Grp-Nr.) is an administrative regulation in the single-entry accounting (dt. Kameralistik) which regulates the classification of revenues and expenditures in the cameral budget according to content allocation, i.e. according to types of revenue or expenditure.

[41] Doppik: Kto shows the number of the differen typs of revenue or expenditure in the double entry accounting (dt. Doppik).

*With * marked descriptions and calculations are taken from the data obtained from the Bertelsmann Stiftung.

Variables	Description	Calculation	Data Sources
Educationally motivated migration	The migration gains or loss per 1,000 inhabitants in the group of 18 to 24 year-olds is x inhabitants of the age group under consideration. Migration for educational purposes typically takes place in the group of 18 to 24 year-olds. *	In-migration of 18-24 year-olds - out-migration of 18-24 year-olds) / population of 18-24 year-olds * 1,000*	Statistische Ämter der Länder
Elderly dependency Ratio (%)	The old-age dependency ratio shows the ratio of people aged 65 and over to people aged 20 to 64 in a municipality. With a ratio of 50, there are 50 people aged 65 and over compared to 100 people aged 20 to 64.*	Population 65+ / Population 20-64 * 100*	Statistische Ämter der Länder
Election	This variable tests for the influence of upcoming elections on the likelihood of PB adoption	The variable is coded 0 if the year is not an election year and coded 1 if the year is an election year.	Websites of the municipalities
Election 2	This variable tests for the influence of upcoming elections on the likelihood of PB adoption	The variable takes the value 1 if it is neither an election year nor the year after an election, 0 otherwise	Websites of the municipalities
Expenditure	In year z, the municipality x had expenditures per inhabitant for current purposes in the amount of y euros.*	Expenditure on current activities (Grp.-Nr. 899 + 935 + 94 + 98 - 679 - 68 - 694 - 695 - 786 - 787 - 80 - 81 - 831 - 86 - 892) / Inhabitants*	Statistische Ämter der Länder
Financial balance	In year z, the municipality t x closed its financial income and expenditure per inhabitant with a surplus/deficit of y euros (income minus expenditure).*	Zinseinnahmen/Dividenden - Zinsausgaben u.ä. (Grp.-Nr. 20 + 21 - 80 - 990 - 991 - 997) / Einwohnern (Stichtag Einwohner: 30.06.); Doppik: Kto. 661 + 6651 - 751 – 7591 Interest income/dividends - interest expenditure. (Grp.-Nr. 20 + 21 - 80 - 990 - 991 - 997) / inhabitants; Doppik: Kto. 661 + 6651 - 751 – 7591*	Statistische Ämter der Länder
Fiscal	This variable measures the efficiency ratio, which indicates the expenses as a percentage of revenue. *	Expenditures/ Revenues*	Statistische Ämter der Länder
Foreigners (%)	The share of residents without German citizenship in the total population is x %.*	Number of foreign residents with main residence / total number of residents with main residence * 100 *	Statistische Ämter der Länder
General certificate of aptitude for higher education (dt. Abitur) (%)	Gives an indication of the distribution of the various degrees and thus the general level of education locally.*	Number of school graduates with entrance qualification for a university of applied sciences or general higher	Statistische Ämter der Länder (*Statistical offices of the Länder*, own translation)

Variables	Description	Calculation	Data Sources
		education / total number of school graduates * 100 *	
High potentials home (%)	The indicator suggests the education and qualification level of the population and the attractiveness of the place of residence for highly qualified people.*	Employees with university degree at place of residence / Employees at place of residence * 100*	Bundesagentur für Arbeit (Federal Employment Agency, own translation)
High potentials work (%)	The indicator suggests the education and qualification level of the population and the attractiveness of the place of work for highly qualified people:*.	Employees with university degree at place of work / Employees at place of work * 100	Bundesagentur für Arbeit
HR expenditure	In year z, the municipality x had personnel expenditure per inhabitant in the amount of y euros.*	HR expenses (Gr.-No. 4) / Inhabitants (Doppik, Kto. 70 + 71 + 741 + 7421)*	Statistische Ämter der Länder
Income tax	In year z, municipality x had a revenue per inhabitant from the municipal share of income tax in the amount of y euros.*	Municipal share of income tax (Gr.-No. 012) / Inhabitants; Doppik: Kto. 6021*	Statistische Ämter der Länder
Interaction Election 2/ Debt per Capita	This variable test if indebted variables are more likely to adopt PB if elections are upcoming.	Interaction of Election2 and Debt per capita	
Interaction Election/ Debt per capita	This variable test if indebted variables are more likely to adopt PB if elections are upcoming.	Interaction of Election and Debt per capita	
Investment grants	The municipality t x received investment grants from the federal government and the *Land* in the amount of y euros per inhabitant in the year z.*	State investment grants (Gr.-No. 360 + 361) / inhabitant; Doppik: Kto. 6810 + 6811*	Statistische Ämter der Länder
Median age	The median age (also central value) refers to the age that forms the boundary between two groups of equal size: 50% of the population are younger and 50% are older than this value.*	Median age = age that statistically divides the population into two equal groups: 50% of the population are younger, and 50% are older than this value*	Statistische Ämter der Länder
PP	The average total net income of a household is x euros. *	Sum of all household net incomes / Number of households*	infas GEOdaten GmbH
Primary balance	The municipality x was able to close the current tasks in year z per inhabitant with a surplus/deficit of y euros.*	Current income - current expenditure / Inhabitants*	Statistische Ämter der Länder

Variables	Description	Calculation	Data Sources
Primary sector (%)	The share of employees in the primary sector (agriculture, forestry, fishing [at the place of work is x % of the total number of employees at the place of work.*	Employees in the primary sector (at place of work) / Employees subject to social security (at place of work) * 100* Note: In regression analysis multiplied by 10.	Bundesagentur für Arbeit
Proximity	This variables measures the effect of nearby municipalities adopting or discussing the adoption of PB on the probability that other municipalities adopt or discuss PB as well.	Municipalities with PB processes in a *Land* / all PB processes in a *Land*	Own calcualtions
Rate support grants (dt. *Schlüsselzuweisungen)*	Municipality x received rate support grants of y euros per inhabitant in year z.*	Rate support grants (Gr.-Nr. 041) / / Inhabitants ; Doppik: Kto. 6111*	Statistische Ämter der Länder
Revenues	In year z, the municipality/district x had current income per inhabitant in the amount of y euros at its disposal for the fulfilment of its tasks.*	Income from current activities (Grp.-Nr. 299 + 345 + 347 + 35 + 36 - 169 - 192 - 193 - 20 - 21 - 27 - 28 - 292 - 81 - 831) / Inhabitants (cut-off date for inhabitants: 30.06.); Doppik: Kto. 6 - L192 - L193 - 661 - 6651- 686 - 69 - 734 – 7371*	Statistische Ämter der Länder
Secondary balance	The municipality x was able to close the current tasks, including financial income and expenditure, with a surplus/deficit of y euros per inhabitant in year z.*	Primary balance + financial balance / Inhabitants*	Statistische Ämter der Länder
Secondary sector (%)	The share of employees subject to social security contributions in the secondary sector (mining, manufacturing, energy, construction at the place of work is x % of the total number of employees at the place of work.*	Employees in the secondary sector (at place of work) / Employees subject (at place of work) * 100 *	Bundes-agentur für Arbeit
Service sector (%)	X % of employees are employed in business-oriented service occupations.*	Employees at the place of work in business-oriented service occupations / Employees subject to social security at the place of work * 100 * Note: In regression analysis multiplied by 10.	Bundes-agentur für Arbeit
Share CDU/CSU	Proportion of municipal council members, that belong to the political party CDU/ CSU.	Share CDU/ CSU in the municipal council	Websites of the municipalities, statistical State Offices

Variables	Description	Calculation	Data Sources
Share Die Linke	Proportion of municipal council members, that belong to the political party Die Linke	Share Die Linke in the municipal council	Websites of the municipalities, statistical State Offices
Share FDP	Proportion of municipal council members, that belong to the political party FDP	Share FDP in the municipal council	Websites of the municipalities, statistical State Offices
Share Grüne	Proportion of municipal council members, that belong to the political party Grüne.	Share Grüne in the municipal council	Websites of the municipalities, statistical State Offices
Share SPD	Proportion of municipal council members, that belong to the political party SPD.	Share SPD in the municipal council	Websites of the municipalities, statistical State Offices
Short-term lendings per capita	In its core budget, municipality x had Short-term lendings of y euros per inhabitant in year z to finance current expenditure.*	Short-term lendings / Inhabitants* Note: In regression analysis multiplied by 1000, as one euro changes little in the probability of PB adoption	Statistische Ämter der Länder
Size	This variable measures the population of a municipality in a given year	Set of dummy variables with 1 = medium-sized (>20,000 to 100,000) or large (>100,000) 0 = small (5,000 to 20,000)	Statistische Ämter der Länder
Social expenditure	In year z, the municipality x financed social transfer payments of y euros per inhabitant. Social transfer payments (Hartz IV, basic benefits in old age, etc.) are a central municipal expenditure item (local social welfare authorities). *	Social assistance + youth welfare + basic security unemployment/old age/reduced earning capacity + asylum seekers + other social benefits Social benefits - ALG II allocations - refunds (Grp.-Nr. 691 + 692 + 693 + 73 to 79 - 786 - 787 - 092 - 093 - 191 - 24 - 25) / Inhabitants* Note: In regression analysis multiplied by 100, as one euro changes little in the probability of PB adoption	Statistische Ämter der Länder
Tertiary sector (%)	The share of employees in the tertiary sector (trade, hotels and restaurants, transport, credit, services, public administration, social services, etc.) is x %. at the place of work is x % of the employees.*	Employees subject to social security in the tertiary sector (at place of work) / Employees s * 100*	Bundesagentur für Arbeit
Trade tax	In year z, municipality x had a trade tax revenue of y euros per inhabitant and after deduction of the trade tax levy.*	Trade tax (net) (Gr.-No. 003 - 81) / Inhabitants; Doppik: Kto. 6013 – 734*	Statistische Ämter der Länder
Uneducated (%)	Gives an indication of the distribution of the various	Number of pupils without a school leaving certificate /	Statistische Ämter der Länder

Variables	Description	Calculation	Data Sources
	degrees and thus the general level of education locally.*	Total number of school graduates * 100*	
Unemployment ratio (%)	The indicator gives indications of social burdens and problems as well as the labour market situation in the municipality.*	X % of the labour force is unemployed. Note: In regression analysis multiplied by 10.*	Bundesagentur für Arbeit
Unemployment ratio long-term (%)	The proportion of long-term unemployed gives an indication of social burdens and problems as well as the labour market situation in the municipality.*	X% of the labour force is long-term unemployed (12 months or longer).*	Bundesagentur für Arbeit

Source: Own composition.

Table A.2: Correlation Matrix of Variables

	Debt per capita	Short-term lendings per capita	Fiscal	Election	Election 2	Size	Service sector	Migration	Constitution type	Communalisation rate	Proximity	Unemployment rate	PP	Primary sector	Social expenditure	Share SPD	Share Grüne
Debt	1																
Short-term lendings per capit	0.52																
Fiscal	-0.03	-0.1	1														
Election	0.01	-0.01	-0.02	1													
Election 2	-0.04	-0.01	0.13	-0.42	1												
Size	0.41	0.35	-0.05	0.00	0	1											
Service sector	0.11	0.1	-0.02	-0.03	0.01	0.26	1										
Migration	0.2	0.1	0	0.04	0.02	0.47	0.21	1									
Constitution	-0.12	-0.23	-0.01	0.01	0.06	-0.19	-0.04	0.01	1								
Communalisation rate	0.01	0.01	-0.07	-0.08	0.02	0.17	0.04	0.1	-0.2	1							
Proximity	0.13	0.26	-0.1	-0.26	-0.04	0.24	0.06	-0.07	-0.61	0.55	1						

	Debt per capita	Short-term lendings per capita	Fiscal	Election	Election 2	Size	Service sector	Migration	Constitution type	Communalisation rate	Proximity	Unemployment rate	PP	Primary sector	Social expenditure	Share SPD	Share Grüne
Unemployment rate	0.42	0.3	-0.1	-0.06	-0.1	0.34	0.08	-0.08	-0.09	-0.23	0.02	1					
PP	-0.31	-0.2	0.01	-0-1	-0.01	-0.18	0.05	0.06	-0.06	0.41	0.19	-0.71	1				
Primary sector	-0.07	-0.1	0.04	0.02	0.01	0.01	-0.13	-0.27	0.01	-0.15	-0.04	0.06	-0.08	1			
Social expenditure	0.44	0.49	-0.01	-0.01	-0.01	0.61	0.23	0.45	-0.15	0.04	0.13	0.31	-0.23	-0.11	1		
Share SPD	0.16	0.27	-0.06	0.14	0.04	0.19	0.04	-0.12	-0.07	0.16	0.19	0.25	-0.17	0.01	0.16	1	
Share Grüne	0.06	0.06	-0.02	0.02	0.03	0.22	0.14	0.22	0.1	0.32	0.14	-0.2	0.28	-0.08	0.19	0.08	1

Source: Own calculations.