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Does inter-municipal cooperation help improve local economic performance? – Evidence from Poland

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Does inter-municipal cooperation help improve local economic performance?

– Evidence from Poland

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Abstract

This paper aims at testing whether inter-municipal cooperation (IMC) in policies to promote local business development has a positive impact on local economic performance. We apply two-way fixed effects as well as marginal structural models to a panel data set covering 1,849 Polish municipalities between 2007 and 2014. We use the unemployment rate and the rate of population growth as a proxy for local economic performance. Our results show a systematic effect of IMC on local economic performance. However, the results are contradictory. While IMC causes higher rates of population growth, they also cause higher rates of unemployment.

Key-words: Inter-municipal cooperation, local business development, population decline, marginal structural models, Poland

JEL: D72, H77, H80, O10

1. Introduction

Citizens and local government benefit from a well-performing local economy as it guarantees employment opportunities and safeguards the local tax base. For local politicians, a good performance of the local economy increases the chance to get re-elected (e.g., Lewis-Beck and Stegmaier, 2000). Local governments have some tools to promote local business development (hereafter LBD). These include marketing activities, investments in business-related infrastructure like business parks, telecommunication infrastructure, or local roads. The theory of fiscal federalism predicts that these tools are likely to be under-used. First, they generate considerable spillovers and thus municipalities have faced incentives to free-ride on the activities of neighboring municipalities (cf. Olson, 1969; Bergholz, 2018). Second, these tools are often too costly to implement for a single municipality while substantial economies of scale can be generated if they are applied at a supra-municipal scale. However, the Coase-Theorem suggests that there is a remedy: inter-municipal cooperation (IMC). Through cooperation, local governments can internalize spillovers as well as share costs and risks associated with LBD policies (e.g., Feiock et al., 2009; Bergholz, 2018). So far, we know very little about the potential of IMC in strengthening local economic performance. This is where our paper comes in.

We analyze the impact of IMC in the field of LBD on local economic performance using data on Polish municipalities in the time-period between 2007 and 2014. We proxy local economic performance with the unemployment rate and population growth. We apply standard two-way fixed effects models with municipal-specific trends as well as marginal structural models. The latter method utilizes propensity score weights to control for the selection into treatment. More importantly, they also deal with the bad control problem emerging when time-variant covariates are driven by the treatment (e.g., Robins et al., 2000; Angrist and Pischke, 2009).

Our results can be summarized as follows: While the existence of IMC as such is not found to have a stable impact on local economic development, we find evidence that they mediate the effect of local government expenditures. The impact of LBD-expenditures coordinated among union members is significantly different from the impact of overall expenditures on LBD. However, the impact is not always positive. Coordination through IMC reduces the rate of population decline yet leads to higher unemployment. These results are backed by both empirical strategies – two-way fixed effects and marginal structural models.

The paper proceeds as follows. Section 2 reviews the relevant literature. The main hypotheses are presented in section 3. Section 4 presents the institutional background in Poland while section 5 describes the data. The empirical strategy is described in section 6 before section 7 presents the results. Section 8 discusses the results and concludes.

2. Literature review

A search for literature on the relationship between local government policies and the performance of the local economy strikes many different strands of literature. The fiscal federalism literature suggests that especially small local governments face limited incentives to engage in LBD policies as these generate positive regional spillovers (e.g., Oates, 1972; Park and Feiock, 2006; Bergholz, 2018). An analogy from the tax competition literature (e.g., Buettner, 2006) suggests that fiscal equalization schemes may further reduce the incentives to engage in local development policies.

The literature on tax competition does not support this conclusion. It argues that local governments use local tax rates and infrastructure projects as strategic tools in the competition for mobile capital (e.g. Taylor, 1992; Wilson, 1999; Salmon, 2006). This inter-jurisdictional competition forces local governments to set low business tax rates and provide high-quality

infrastructure and even bears the danger that these tools are used too extensively – meaning that municipalities set inefficiently low tax rates and provide too much business-related infrastructure (e.g., Taylor, 1992; Wellisch, 2006; Jayet and Paty, 2006). While the question whether or not inter-local competition increases efficiency is disputed, there is a broad consensus that it leaves the single municipality with little political leeway.[1]

The literature on New Economic Geography offers an even more pessimistic view. Accordingly, the regional distribution of economic activities is driven by agglomeration forces and dispersion forces. Initially small inter-regional differences in regional economic activities may grow to substantial differences because agglomeration forces make the region with the higher activities more attractive for both firms and workers. The process of agglomeration only stops when dispersion forces outweigh the agglomeration forces (e.g., Borck and Pflüger, 2006). Consequently, the scope for local-level policies to influence the process of agglomeration is limited. This implies that inter-local competition largely takes place between jurisdictions within the same region.

The scope of upper-tier governments and supranational organizations trying to mitigate the consequences of agglomeration through top-down regional policies is the subject of yet another strand of literature. In their recent survey, Neumark and Simpson (2015) have coined the term place-based policies. Place-based policies can be justified on efficiency grounds because agglomerations generate negative externalities. Often – like in the European Union (e.g.,

[1] Another, remotely related strand of literature analyzes the relationship between decentralization and economic performance. The meta-study by Baskaran et al. (2016) supports the notion that decentralization may have a positive impact on overall economic performance within a country. However, they do not refer to the role of local government policies.

Becker et al., 2012) – it is motivated on distributional grounds. Numerous studies assess the success of these place-based policies (for a survey, see Neumark and Simpson, 2015). The evidence is mixed. Positive effects are often reported for policies that develop the hitherto low-quality infrastructure in peripheral regions (Dreger and Reimers, 2014; e.g., Zhang and Sun, 2019) while evidence on enterprise zones is mixed (e.g., Neumark and Simpson, 2015). The literature assessing the effects of EU regional policies finds positive effects of some instruments (e.g., Mohl and Hagen, 2010) though they do not seem persistent (e.g., Becker et al., 2018).

The bottom-line of the above literature is that the scope for local governments to promote local economic performance is limited – with the main concern being not to fall behind the intra-regional competitors. However, this literature ignores the implications of the Coase-Theorem and the role of IMC. Through IMC, municipalities can establish a platform that allows for the coordination of policies used in the competition for mobile capital (e.g., Bischoff et al., forthc.). This platform enables local governments to internalize spillovers and allows especially smaller jurisdictions to pool risks and exploit economies of scale (e.g., Feiock et al., 2009). Thereby, LBD policies that are not beneficial when carried out individually become beneficial under IMC. This line of argumentation suggests that IMC in the field of LBD policies has the potential to improve local economic performance.

The last two decades have seen a steady increase in the intensity of inter-municipal cooperation (e.g., Hulst and van Montfort, 2007; Rosenfeld et al., 2016). The scientific literature contains numerous studies on the factors driving the emergence of IMC (e.g., Bel et al., 2013b). One strand of literature focusses on municipal characteristics and how they shape the expected gains from IMC – showing that especially small and fiscally weak municipalities are more likely to cooperate (e.g., Warner and Hefetz, 2002; Bel et al., 2013b; Schoute et al., 2018).

Pioneered by Richard Feiock and co-authors, the Institutional Collective Action (ICA) approach illustrates that negotiating, implementing and controlling IMC-contracts entail substantial transaction costs (e.g., Feiock and Scholz, 2009). Empirical studies following this logic show that municipalities with similar characteristics or pre-existing political networks are more likely to cooperate (e.g., Feiock et al., 2009; LeRoux et al., 2010). Blaeschke (2014) and Bel and Warner (2016) provide excellent surveys of the relevant literature.

So far, however, only few studies addressed the question whether or not IMC really lives up to the expectations of its proponents. These studies can be divided into two groups. The first group of studies focusses on the impact of IMC in the capital-intensive technical infrastructure like sewage or waste disposal (e.g., Bel and Warner, 2008; Bel et al., 2013a). Applying sophisticated methods of efficiency analysis, these studies generally find cooperating municipalities to be more (cost-) efficient than municipalities that do not cooperate (e.g., Bel et al., 2013a).[2] The second group of studies focusses on IMC in other fields of government activities where an appropriate measure of success is more difficult to find. The relevant studies often use gross expenditures per capita and many of them do not differentiate between the fields in which municipalities cooperate (Bel and Sebő, 2019).[3] The results so far are inconclusive. This may be partly due to the fact that the indicator "gross expenditures per capita" does not allow for a straight-forward interpretation (Fiorillo and Ermini, 2008; Luca and Modrego, 2019). To see this, consider the example of municipalities cooperating in the field of administrative services

[2] For an exception, see Luca and Modrego (2019).

[3] One noteworthy exception is the study by Niaounakis and Blank (2017). They find that IMC in the Dutch tax administration reduces specific costs per capita especially for small municipalities.

(e.g. in the field of IT). If this cooperation reduces costs, the resources saved in these services may be spent on improving the quality of other services – e.g. through additional personnel in the local kindergarten. In this case, IMC had a positive effect yet the gross expenditures per capita do not change.

With respect to the methods used, both strands of literature largely rely on cross-sectional analyses that cannot control for unobserved heterogeneity. Moreover, most studies do not control for selection into treatment.[4] Thus, their results do not allow for a causal interpretation. We are aware of only one study that allows for a causal interpretation. Ferraresi et al. (2018) apply a difference-in-difference model that uses matching techniques to control for the selection into treatment. They find a robust and persistent reduction of total expenditures per capita for municipalities organized in municipal unions of the Italian region of Emilia Romagna. They do not find any evidence that this effect comes at the price of reduced service quality[5]. Summing up, the causal effect of IMC has received little attention so far. This paper contributes to filling this research gap.

[4] In the case of the first group of studies, the IMC-unions analyzed usually exist for many decades and thus the available data does not cover the time before the unions were formed. Therefore, the data needed to control for the selection into treatment is often missing.

[5] Osterrieder et al. (2006) argue that cooperation in the field of economic development can lessen gender, social and regional inequalities by common development planning. The overview of cooperation among European municipalities provided by Teles and Swianiewicz (2017) shows that it is frequently focused on the field of economic development in e.g. Czech Republic, Iceland, Portugal and Slovakia. Yet the number of studies examining whether the economic development goals of IMC declared by its members were accomplished is limited. In two case studies, Lysek and Šaradín (2018) find the success of IMC in the field of economic development to be connected with appropriate governance with reference to human capital.

3. Hypotheses

We focus on IMC in the field of LBD. Our research question reads as follows: Does IMC in LBD policies improve local economic performance? This section seeks to identify the main mechanisms that need to be accounted for. To this end, we have to take a closer look at the characteristics of LBD policies. Many of these are characterized by economies of scale and a high share of sunk costs. This applies to all investments in the local infrastructure like roads, business parks or fast internet connections, but also to marketing measures aiming to attract firms (e.g., Jayet and Paty, 2006; Dreger and Reimers, 2014). Taking these policy measures jointly allows municipalities to generate economies of scale and/or share risks. Thereby, policy measures that are not beneficial when carried out individually become beneficial for municipalities organized in inter-municipal consortia. In addition, some of the above-mentioned policy measures are likely to generate positive regional spillovers and IMC-consortia provide the political arena to internalize these spillovers (e.g., Feiock, 2007). The argumentations above suggest that – other things equal - municipalities organized in IMC-consortia spend more resources on LBD than municipalities that are not member of such consortia.

On the other hand, Taylor (1992) and Jayet and Paty (2006) show that an intense competition for mobile capital leads to an over-provision of business-related infrastructure. In this case, IMC may be a platform through which municipalities can agree to reduce over-provision (Bischoff et al., forthc.). Thus, IMC may go along with less LBD activities. The net effect of IMC on the intensity of LBD activities is unclear ex ante.

Regardless of the intensity of LBD activities, coordinated infrastructure investments and marketing activities are likely to be more productive than uncoordinated activities that potentially offset each other. Therefore, we expect IMC to have a directly positive impact on local economic performance. Thus, our first hypothesis reads:

H1: Direct effect of IMC

IMC in the field of LBD policies has a positive impact on local economic performance.

Even though the impact of IMC on LBD activities is unclear ex ante, it seems reasonable to assume that the benefit of coordination rises in the intensity of activities that are coordinated. We expect IMC to increase the efficacy of every Euro spent by the consortium. This leads to our second hypothesis:

H2: Increased efficacy of LBD policies through IMC

The impact of IMC on local economic performance is larger, the more resources the members of the consortium spend on LBD.

It is important to note that the increase in efficacy applies to all projects geared towards LBD – regardless of whether they are pursued under the roof of the consortium or directly by the municipalities themselves. In the empirical analysis below, we will test for the mediating effect of IMC on LBD expenditures spent through different channels.

4. Institutional background

4.1 The role of Polish municipalities

In the process of economic transformation, Polish local self-government was restored in 1990 after 40 years of nonexistence. The three-tier territorial division of Poland and, at the same time, the three-tier local self-government was introduced in 1999. Currently, Poland consists of 16

regions (voivodeships), 314 counties and 2478 municipalities[6]. The Constitution of the Republic of Poland guarantees municipalities the status of dominant jurisdiction – responsible for all local self-government public tasks not explicitly assigned to counties or regions. Among other tasks, municipalities are in charge of primary education and upbringing, social security, transportation, water supply and management, gas and electricity, housing, health services, public order and culture.[7] Municipal revenues stem from local taxes and charges (approx. one third of total revenues), shares in personal (PIT) and corporate (CIT) income taxes (approx. one fifth of total revenues) and conditional and unconditional grants (Act of 13 November 2003).

The economic and fiscal situation of municipalities in Poland varies remarkably depending mainly on the type of municipality – with urban municipalities generally being economically and fiscally stronger than rural ones. Comparing the percentage of total expenditures covered with own revenues, the top decile of municipalities' outcome reaches 63%, whereas the lowest reaches only 21% – with the average being 37%. Rural municipalities, especially in the eastern parts of Poland, are characterized by unemployment rates of up to over 30%, whereas other regions reach rates of less than 1% (e.g., Banaszewska and Bischoff, 2017).

6 The number of municipalities is stable from October 2002, with only one change from 2478 to 2479 in 2010-2014. In 2010 one new municipality was established, but in 2015 two other municipalities were merged.

7 The scope of public services delivered by municipalities is generally independent of their type – urban, rural and urban rural – except for cities with county rights that perform tasks reserved for counties as well.

After the EU-accession in 2004, Poland is among the primary recipients of EU funds[8] (e.g., Banaszewska and Bischoff, 2017). Polish municipalities received roughly one third of these funds – amounting to an annual influx to the municipal budget of 39 € per capita on average (constant prices). This accounts for more than 5 percent of total municipal expenditures and 20 percent of investment expenditures on average. EU funds are spent on highly visible projects and the utilization of EU funds can be expected to have a considerable impact on citizens' living conditions (e.g., Banaszewska and Bischoff, 2017). EU funds supported the building and modernizing infrastructure as well as "soft projects" (trainings, events, consulting services etc.) within a wide scope of fields such as transportation, technical utilities, schooling, social assistance, culture, tourism and sports. The scope of these projects goes far beyond the LBD policies that we are primarily interested in in this paper.

4.2 Polish IMC-unions

The Constitution of the Republic of Poland (Act of 5 June 1998) states that municipalities have the right to associate in various forms on the local, regional, national or international level. They are allowed to jointly provide public goods and services by transferring tasks to inter-municipal unions (IMC-unions) or to settle the joint provision in an inter-municipal agreement. Both forms are subject to the principles of administrative law (Act of 8 March 1990). In addition, municipalities can choose two other forms of cooperation regulated by private law – associations and inter-communal companies. Official statistical data or financial statements are available for

[8] These comprise of funds from the European Regional Development Fund, European Social Fund and Cohesion Fund as well as funds from Common Agricultural Policy and Common Fisheries Policy.

IMC-unions but not for inter-municipal agreements, associations or inter-communal companies. For this reason, the upcoming analysis will focus on IMC-unions.

IMC-unions are voluntarily established via official statutes approved by the cooperating municipalities as separate entities with legal status. Once they are formed, they execute public tasks specified in their statutes on their own behalf and on their own responsibility.[9] IMC-unions are subject to the same financial management rules as municipalities and are empowered to run independent economic activity. In contrast to other European countries, the formation of Polish IMC-unions is not encouraged by any financial incentives from upper-tier governments. They generate revenues mainly from membership contributions (current and investment), but also from charges for providing public services, revenues stemming from own assets and EU funds. The division of costs, profits and liabilities is regulated by the statute (Act of 8 March 1990).

The official register of IMC-unions in Poland is run by the Ministry of the Interior and Administration. According to the register from 2017, 313 IMC-unions have been created since 1990 (the latest in 2016) and 208 were active up to that date (see Figure 1). Figure 1 shows that the variation of IMC-unions formation is linked to major institutional reforms in Poland. The

9 IMC-unions are managed by assembly and management board. An assembly is a control and resolution-passing authority constituted by the mayors of the member municipalities. The statute may grant more than one vote to certain municipalities. Additional representatives are appointed by the municipal councils concerned. The second body, the management board, is an executive authority appointed and dismissed by the assembly from among its members. As long as it is allowed by the statute, it is permissible to elect members of the management board from outside the assembly members in the number not exceeding one third of the total number of management board members (Act of 8 March 1990).

first compelling period covers the years 1991-1994 when many unions were established. Kołsut (2015) argues that uncertainty and instability caused by the economic transformation stimulated municipalities to join forces. During the period of 2000-2004, the three-tier territorial division of Poland was installed and the upcoming Polish accession to the European Union forced Polish jurisdictions to implement many EU regulations[10]. Some of the unions emerging in this period were formed to attract EU funds (e.g., Osterrieder et al., 2006) but by far not all of them were successful (e.g., Swianiewicz et al., 2016). Unfortunately, neither the official register of IMC-unions nor their statutes provides us with information about which unions were formed to acquire EU funds. In the period after 2005, the number of newly established IMC-unions was significantly lower. Moreover, municipalities started to dissolve some of the unions – either because their goals were accomplished or because the cooperation did not satisfy their members (e.g., Swianiewicz et al., 2016).

[Figure 1 about here]

By 2017, 69 % of all municipalities in Poland became a member of at least one IMC-union. More of 60 percent of these municipalities are rural municipalities; urban municipalities account for only 13%. Most of the IMC-unions (52%) have been of medium size (established by 4-9 municipalities); 28% of them can be considered as large (from 10 up to 49 municipalities) and 20% as small (2-3 municipalities). According to Polish law, the number of IMC-unions that municipalities cooperate through is not restricted. In the period of 1990-2017 this number

[10] The new regulations concerned solid waste disposal, among others, which apparently was one of the main tasks that new IMC-unions were formed for (Kołsut, 2015).

varied from 1 to 6 with 39% of municipalities being a member of the only one union, 36% are in two unions and 17% are in three unions.

The scope of public services provided by IMC-unions in Poland embraces almost all municipal activities.[11] (see Figure 2). 232 unions engaged in LBD activities for the member municipalities. Another task of great importance is connected to environmental protection with 157 unions formed to provide services in this area. Numerous IMC-unions jointly deliver public services connected with solid waste (117), wastewater management (97) or wastewater treatment (66) and tourism (75).

[Figure 2 about here]

5. Data

The main purpose of our study is to test whether IMC in the field of LBD increases local economic performance. Unfortunately, GDP per capita is not available at the local level. Therefore, we use the unemployment rate and the rate of population growth to capture local economic performance. The unemployment rate used here is defined as the ratio of unemployed to population at working age. A low unemployment rate indicates that the local economy is strong and structural skill mismatch stands for a minor problem. We use population growth because population decline has been a major problem of Poland after EU–accession – especially in rural areas. Preventing the outflux of population and/or attracting new citizens – even at a given level of unemployment – is thus considered an important political aim in Poland (Ministry of Administration and Digitalization, 2013).

[11] A large majority of unions proclaimed to be responsible for far more than one category of tasks. For detailed list of tasks classified to each field, please see the table A.1 in the Appendix.

The main hypotheses stated in section 3 claim that the effect of IMC on local performance depends not only on the existence of an IMC-consortium (hypothesis H1). Furthermore, IMC is expected to raise the efficacy of LBD policies carried out individually by the members of the IMC-consortium. To test these hypotheses, we have to restrict the analysis to the role of IMC-unions. Other forms of IMC, especially inter-municipal agreements, associations and inter-communal companies, cannot be analyzed because budget data is not available.[12]

In the upcoming analysis, we use yearly data[13] on Polish municipalities and IMC-unions that started to cooperate between 2007 and 2014 and state in their statutes to jointly deliver services in the field of LBD[14]. This field includes all policies directed to the development of

[12] The same applies to the so-called Local Action Groups (LAGs). LAGs were formed in order to prepare the Local Development Strategies and apply for funds from the Rural Development Programme for 2007-2013 and 2014-2020 periods. They operate as foundations, unions of associations and associations. In the period of 2007-2013 LAGs covered 93% of the area eligible for support under Rural Development Programme (89% of the total area of Poland) (Agrotec Polska Sp. z o.o., 2010). Given this lack of variation we do not include them in the analysis. At the same time, we control for the amount of EU funds spent by local governments.

[13] Data on IMC-unions come from the official register of IMC-unions run by the Ministry of the Interior and Administration which is based on their official statutes. Demographic and socio-economic variables were extracted from Central Statistical Office Local Data Bank, apart from the data on own revenue capacity which was obtained from the Ministry of Finance. Geographic data were extracted from Central Statistical Office Local Data Bank and Geodesic and Cartographic Documentation Centre. National election results were collected from National Electoral Commission.

[14] For detailed list of tasks classified to the field of local business development, see the table A.1 in the Appendix.

infrastructure of critical importance for local firms – among them modern technology of telecommunication and payment systems, roads and public transportation. We also include projects that aim at the modernization of the local public administration. At the same time, we exclude IMC-unions focusing on tourism, water and sewage infrastructure or energy supply. Policies aimed at counteracting unemployment are performed by upper-tier governments (counties). Thus, there are no IMC-unions directly aiming at the reduction of local unemployment.

Figure 3 depicts the emergence of IMC-unions in the field of LBD with the number of municipalities that engaged in the cooperation in each year from 2007 to 2014. They were formed by the overall number of 130 municipalities. The cumulative number of municipalities cooperating in the field of LBD in each year between 2007 and 2014 is presented in Figure 4. It is important to note that each municipality in our treatment group becomes member of only one IMC-union that aims at promoting LBD. Hence, we can express the relevant independent variable as a dummy in order to test Hypothesis 1. At the same time, most municipalities in control and treatment group are members in IMC-unions formed for other purposes.

[Figure 3 about here]

[Figure 4 about here]

In the upcoming analysis, these 130 municipalities (out of a total of 2478) form the treatment group. The control group consists of 1719 municipalities that do not cooperate in this field prior to 2007 and do not start cooperation in LBD in our period of observation. We drop all municipalities that already cooperated in LBD before 2007. A few more municipalities were excluded because of missing data. Figure 5 presents the geographical distribution of municipalities in the treated and control group. Both groups are widely distributed over the territory of Poland.

[Figure 5 about here]

Table 2 compares treatment and control group with respect to a number of other important socio-demographic, fiscal and institutional characteristics in 2007.[15] On average, the unemployment rate amounted to 8.6 % in the control group and to 9.8% in the treated group. The population in the control group was growing by less than one percent, while the treatment group was on average shrinking by 0.28 percent. The control group spent an average of 205€ per capita on LBD, the treatment group 190€. The mean per capita EU-funds spent by the municipalities was higher in the control group than in the treated group and amounted to 106€ and 92€ respectively. The same holds for the EU funds the municipalities spent on investments (40€ and 24€, respectively). The area of the average municipality in the control group was smaller than in the treated group and amounted to 124.54 and 144.66 square kilometers respectively. Descriptive statistics indicate that municipalities in the control group, are, on average, involved in more unions of other types (0.46) than municipalities in the treated group (0.3). For municipalities in the treatment group, the share of neighboring municipalities with the same party obtaining the highest support in previous parliamentary elections was, on average (0.54) higher than in the control group (0.46). Among the differences in the average characteristics of treatment and control group described above, only the difference in the unemployment rate, LBD expenditures, EU-funds and EU-funds spent on investment, area and the same party support is

15 Demographic and socio-economic variables were extracted from the Central Statistical Office Local Data Bank, apart from the data on own revenue capacity which was obtained from the Ministry of Finance. Geographic data were extracted from the Central Statistical Office Local Data Bank and Geodesic and Cartographic Documentation Center. National election results were collected from the National Electoral Commission.

statistically significant ($p < 0.05$). The remaining sample baseline means for the treated and control group are similar.

[Table 2 about here]

6. Empirical strategy

In order to test hypotheses H1 and H2 (see section 3), we apply two different empirical methods to the data describe above. First, we apply a two-way fixed effects panel model. Second, we apply marginal structural models (MSM).

6.1. Fixed-Effects Model

Our fixed-effects model predicts local economic performance in municipality m in time t, LEP_{mt}. The following empirical model defines the starting point of panel regressions:

$$LEP_{mt} = \beta_0 + \beta_1 IMC_{mt-1} + \beta_2 X_{mt-1} + \alpha_m + \varepsilon_{mt} \quad (1)$$

IMC_{mt-1} is the treatment dummy, taking the value 1 if municipality m has been a member of a LBD IMC-union in the year t-1. The matrix X_{mt-1} contains a number of other time-varying factors that have the potential to drive local economic performance. First and most straight-forward, X_{mt-1} includes the expenditures on LBD by municipality m in t-1 (Exp. LBD). This variable covers the expenditures made by municipality m individually as well as municipality m's share in the expenditures of an IMC-union (for municipalities in the treatment group). Furthermore, it does not differentiate between expenditures funded by EU funds and expenditures funded from other revenues. In later specifications, we will differentiate between the different components of these expenditures.

In order to capture spillovers stemming from other municipalities, we have to control for their expenditures on LBD. When defining the set of municipalities whose activities have a major impact on the economic performance in municipality m, we restrict the set to those municipalities that share a common border with municipality m. In the regressions, we control for the sum of expenditures on LBD by m's neighbors (Exp. LBD (sum neighbors)). In the baseline specification, we do not differentiate between neighbors that cooperate with municipality m in LBD and neighbors that do not. In later specifications, this distinction will be made.

Third, we control for the number of other unions municipality m is member of[16]. The latter variable controls for the argument put forth by Steiner (2003) that existing IMC-consortia may help coordinate municipal activities in fields that lie beyond the scope stated in the consortiums' statutes.

We further include m's membership in special economic zones. These zones are formed top down by the central government (Council of Ministers) after the request of the Minister of Economy. The request is submitted after receiving the opinion of the voivodship board and consent of a municipality council. Special economic zones are characterized by preferential conditions for business activity such as a corporate income tax exemption, a real estate tax exemption and a wider range of deductible costs connected with the investment. Their main role is to stimulate regional economic development, administer post-industrial estates and infrastructure, generate new job places and attract international investors (for further details see KPMG, 2009). Finally, we control for the size of municipality m, and include year dummies to control for external shocks common to all municipalities. In addition, we include municipal-

[16] See Table 1 for variable descriptions.

specific linear time trends. To account for important time-invariant factors and the initial level of economic performance, we introduce municipal fixed effects (α_m); the error term is denoted ε_{mt}. Standard errors are clustered at municipal level.

The main strength of the fixed-effects model (FE) used above is that it controls for time-invariant unobserved heterogeneity and for municipal-specific trends. At the same time, it suffers from two shortcomings that are potentially severe in the context of this paper. First, time-varying factors that are themselves dependent on prior treatment are bad controls and may bias the estimated effect of IMC. In particular, the formation of IMC may lead to higher expenditures on LBD which in turn improve economic performance. In explaining economic performance, controlling for both IMC and expenditures on LBD invites a bad control problem (cf. Angrist and Pischke, 2009). Second, two-way-fixed-effects models do not account for self-selection into treatment. Therefore, we also apply a second approach: Marginal structural models.

6.2. Inverse probability of treatment weighting and marginal structural models

Originating in the field of epidemiology, marginal structural models have been used to make causal inference possible for observational studies in which time-varying confounding renders traditional approaches unfeasible. Using inverse probability of treatment weights, marginal structural models (MSMs) model the marginal means of potential outcomes rather than observed outcomes. They have been introduced by Robins et al. (2000) and have been applied in political sciences, e.g. Blackwell (2013), and sociology, e.g. Sharkey and Elwert (2011).

In MSMs, observations are weighted by inverse probability of treatment weights (IPTW). IPTWs encompass the inverse probability to get treated conditional on treatment history, $\overline{IMC}_{mt-1}$, covariates measured at baseline, $X_{mt=0}$, and covariate history, $\overline{X}_{mt-1}$ (see Equation (2)).

$$\widehat{W_m} = \prod_{t=1}^{T} \frac{1}{\Pr(IMC_{mt} \mid \overline{IMC}_{mt-1}, X_{mt=0}, \overline{X}_{mt-1})} \qquad (2)$$

Unlike traditional weighting or matching procedures, where weights are calculated only based on pre-treatment information, MSMs apply weights that also account for post-treatment information. In particular, they account for the time-varying confounders that themselves are influenced by the treatment history. In our case, the most important confounding variable is the amount of resources spent on LBD, as it is expected to drive local economic performance but may change once an IMC-union is formed (see section 3). In the weighted population treatment is no longer confounded since covariates are balanced across time and treatment histories.

Because these weights can reach quite extreme values, the literature suggests stabilized weights where the numerator contains the probability to get treated conditional only on treatment history and baseline covariates (cf. Cole and Hernán, 2008; Thoemmes and Ong, 2016):

$$\widehat{SW_m} = \prod_{t=1}^{T} \frac{\Pr(IMC_{mt} \mid \overline{IMC}_{mt-1}, X_{mt=0})}{\Pr(IMC_{mt} \mid \overline{IMC}_{mt-1}, X_{mt=0}, \overline{X}_{mt-1})} \qquad (3)$$

The MSM-approach is based on two important assumptions. First, it is assumed that all municipalities have some chance of getting treated, which is called the positivity assumption. Second, the MSM-approach rests on the assumption of sequential ignorability. Accordingly, conditional on past confounders, treatment assignment is independent of potential outcomes. This implies that there is no unmeasured confounding, a strong assumption which cannot be

explicitly tested. In the case of IMC, we can make use of rather abundant information on Polish municipalities and draw on findings from the rich literature on IMC emergence to thoroughly capture the dynamic of IMC. Our model accounts for all major factors found to drive IMC in the vast literature on IMC emergence (see section 2). We rely on Feiock's theoretical framework for the emergence of IMC in which economies of scale and scope, as well as transaction costs play a role in determining how attractive it is to start cooperation (e.g., Feiock, 2007). We accommodate the factors presented in the recent literature review provided by Bel and Warner (2016). We follow Blaeschke (2014) and include not only variables describing the observed municipality m, but also variables describing m's pool of potential cooperation partners. To this end, we include so-called spatial lags (the median value of m's neighbors) of the population size, population growth, unemployment rate, per capita tax revenue, and expenditures on LBD.[17] We also include the share of neighboring municipalities with the same party leading in the national election as the observed municipality to account for political transaction costs. We further control for the number of union memberships, other than LBD unions, to reflect willingness to cooperate and existing cooperation networks. In addition, we control for m's membership in a special economic zone. Lastly, we include municipality m's number of neighbors, dummy variables indicating whether municipality m is rural and/or a city with county rights and dummy variables marking regions and years.

[Table 4 here]

[17] We do not use EU funds per capita as a separate explanatory variable because the EU funds spent on local business development are already contained in the corresponding expenditure variables. In addition, the institutional literature reviewed in section 4 clearly states that some IMC-unions were founded to acquire EU funds in the future.

Table 4 reports the logit model estimated to predict the emergence of IMC. The dependent variable is 1 if municipality m cooperates in year t (0 else). In line with previous findings (e.g., Bischoff and Wolfschütz, 2019), cooperation is largely persistent. Thus, cooperation in the previous year is a good predictor for cooperation in year t. Municipalities growing in population size are less likely to cooperate (see also Bischoff and Wolfschütz, 2019), as are municipalities that are part of a special economic zone. Political homogeneity among municipality m and its neighbors has a positive effect on the probability to engage in IMC.

Predicting the propensity score from this model gives us the denominator for the IPTW in equation (2) and (3). In a second step, cooperation is modelled conditional only on past cooperation and baseline covariates, giving us the numerator in equation (3). Based on these estimates, we construct the stabilized weights, described in Table 3, and estimate a weighted linear model predicting the outcome at the end of our observation period:

$$LEP_m = \beta_0 + \beta_1 IMC_m + \beta_2 X_{mt=0} + \varepsilon_m \quad (4)$$

Mirroring the FE-model, we include the treatment dummy, IMC_m that takes the value of 1 if m has been part of an LBD-union during our observation period. $X_{mt=0}$ contains covariates – both time varying and time-invariant at baseline, and ε_m is the error term.

7. Results

We apply the models presented in the previous section to test for hypotheses H1 and H2. Both predict a positive impact of IMC on local economic performance. More precisely, we hypothesize that IMC reduces local unemployment and raises the local rate of population growth. The first hypothesis refers to the effect of IMC itself. We test H1 by including a simple treatment dummy, in model (1), and by including the number of direct neighbors that are m's partners in

the LBD-union, in model (2). H2 postulates that IMC has a mediating effect on LBD expenditures. Municipalities that are part of a union can make LBD-expenditures via the union's budget or on their own. Thus, we employ two specifications in our analysis: first, we include the per capita union expenditures by m and its neighboring union partners. With this measure we test for the effect of resources spent cooperatively[18]. In the second specification, we include LBD-expenditures made by m and its neighboring union partners. Here, we test whether cooperation affects all resources spent on LBD, regardless of whether they are spent cooperatively (through the union) or not. In a final specification, we test for a possible impact on IMC on the efficacy of EU funds utilized by its union members. Investments funded by the EU constitute a crucial form of place-based policies in Poland in our period of observation. The final specification introduces the corresponding per capita expenditures of municipality m and its neighboring union partners.

Table 5 shows the results from the FE-model. Our treatment dummy shows no significant effect on our outcome measures. Looking at the number of direct neighbors that are in a union with m, we find a significant negative effect on m's unemployment rate, supporting our hypothesis H1, while there is no effect on population growth. For the union expenditures of m and its neighboring union-partners, as well as for the EU-investments spent by m and m's neighboring union-partners, we find no significant effect on our performance measures. Lastly, we find a weakly significant and positive effect of the total LBD- expenditures by municipality m and its

[18] Since our data gives us information about the total expenditures of a union, but not how expenditures are distributed within the union, we use per capita union expenditures and assume that expenditures are distributed equally among union members.

union partners on m's unemployment rate. Given these mixed results, we cannot confirm our hypothesis H2.

Table 6 presents the results of the MSM. The literature on IPTW and MSM suggests to truncate weights in order to address extreme weights (e.g., Thoemmes and Ong, 2016). Table 3 presents descriptive statistics of our original weights and the weights after truncation at the 1st and 99th percentile. As the original weights are not extreme and the mean is close to one, results of the MSMs using truncated weights (Table 6) closely resemble results from MSMs using the original weights. We find a positive effect of union expenditures on the unemployment rate, which is the only effect in our MSM-model that is robust to truncation. All other variables of interest are non-significant.

The theoretical literature on local business expenditures we used to back our hypotheses clearly states that these expenditures generate substantial regional spillovers. Thus, the impact of IMC and the resulting LBD-expenditures are not restricted to municipality m but also impact its neighbors. Therefore, the regressions in table 5 and 6 may underestimate the effect of IMC on local economic performance. To account for the role of spillovers, we repeat our analyses for the neighborhood median of our performance measures – i.e. the median unemployment rate or rate of population growth in the cluster of municipality m and its neighbors. Table 7 and 8 present the FE- models and MSMs with the neighborhood median of the unemployment rate, population growth and revenue capacity as dependent variables.

The results for the FE-models show a significant positive effect of LBD-resources spent within a union on neighborhood unemployment. We further find IMC, as well as the number of m's neighboring union-partners, to have a positive effect on the neighborhood's population growth, confirming hypothesis H1. The union expenditures by m and its neighboring union-

partners, as well as the LBD expenditures of union members in the neighborhood, show a positive effect on neighborhood population growth, partly supporting hypothesis H2. We do not find an effect of EU-funds spent by m and m's union neighbors.

The MSM confirms a positive effect on population growth by LBD expenditures from union members in the neighborhood. In addition, EU-investment funds spent by m and m's union neighbors also have a positive effect on neighborhood population growth. We further find a positive effect of union expenditures on the neighborhood unemployment rate, which is also robust to truncation of extreme weights.

8. Concluding remarks

Though the literature on IMC emergence is rich, only very few studies addressed the question whether or not IMC-arrangements are actually effective in reaching the proclaimed aims. Acknowledging the relevance of cooperation in the field of LBD we use data on Polish municipalities and IMC-unions that started to cooperate between 2007 and 2014 to test if IMC in the field of LBD serves its purpose. Next to a standard two-way fixed effects panel model, we apply a counterfactual approach in which we account for time varying treatment as well as time varying factors in estimating inverse probability of treatment weights. This approach allows us to model the marginal means of potential outcomes rather than observed outcomes and makes causal inference via the class of marginal structural models.

Our study is not without limitations. First and most importantly, our measures for local economic performance are incomplete. Unfortunately, data on GDP per capita is not available at municipal level. We could have used the per capita revenues from tax sharing that municipalities receive as the tax bases of personal and corporate income taxes are closely linked to the value added at local level. Unfortunately, however, personal income tax underwent a major

reform in 2009 and thus caused a structural break that affected municipalities in different ways – dependent on their income structure and the share of the agricultural sector.

Our results only partly confirm a positive effect of IMC on local economic performance. While we find IMC positively affecting population growth, and negatively affecting unemployment in the FE-model, we do not find any direct effect in the MSM. Regarding our second hypothesis, we find mixed results. Population growth is positively affected by union expenditures, LBD-expenditures, and EU-investment funds spent on LBD. However, the FE-model and the MSM also produce a positive effect of union expenditures and LBD-expenditures on unemployment. Thus, we can only partly confirm hypothesis H2. The most stable results are found for the neighborhood median values of our outcome variables (see Table 7 and 8), showing that cooperation impacts the economic performance of municipalities themselves, but also their neighbors' performance. This finding supports the notion that spillovers play an important role in the context of LBD.

The main result can be interpreted in different ways. Looking at the impact of IMC on unemployment rates, one may argue that IMC misses the target. One possible explanation is that IMC takes the form of a cartel that reduces competition among its members. This may be beneficial for the local incumbents yet come at the price of a reduction in local public efficiency (e.g., Di Liddo and Giuranno, 2016) which in turn leads to higher unemployment rates. However, one side result is at odds with this interpretation: We find that the membership of municipality m IMC-unions devoted to other purposes than LBD to be associated with a reduction in unemployment rate. This result contradicts the notion that IMC can be equated with welfare-reducing cartels.

An alternative interpretation for our mixed results starts from the fact that preventing or at least mitigating population decline was a primary political goal of Polish governments after the EU-accession. If this aim was the top priority, IMC must be regarded to be successful – albeit at the price of higher unemployment. This interpretation is supported by the result from table 3 according to which the rate of population growth has a negative impact on the probability of forming an IMC-union to promote LBD. At this stage, however, this interpretation is clearly ad hoc. More research is needed to understand the impact of IMC. The need for further research does not only pertains to the role of IMC in promoting LBD. Instead, there is a general lack of empirical research on the impact of IMC. This paper shows that marginal structural models provide a suitable method to this end.

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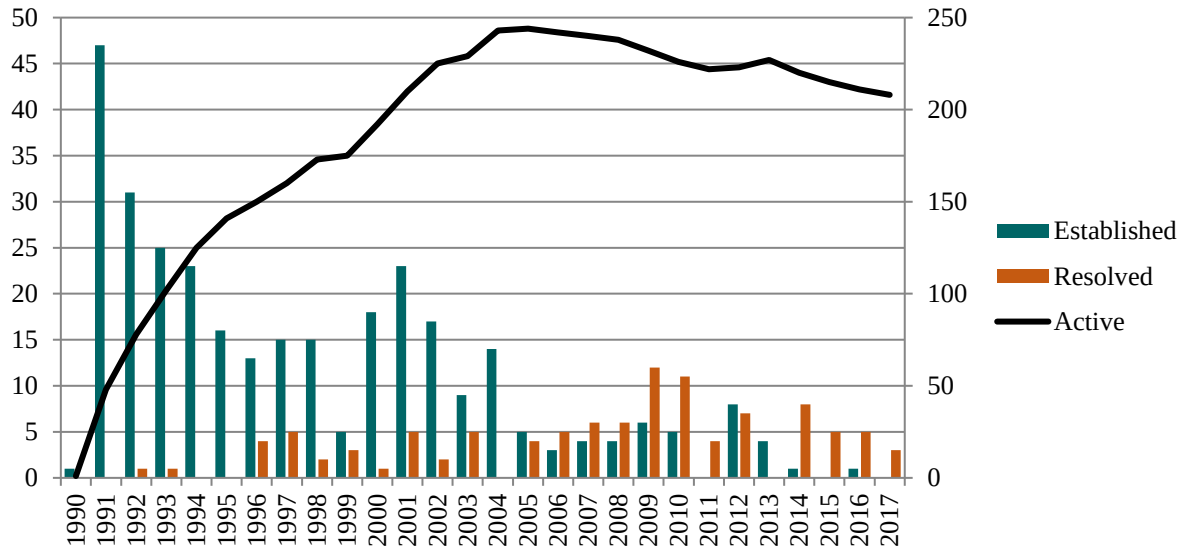

Figure 1. The number of established, resolved (left axis) and active (right axis) inter-municipal unions in Poland in 1990-2017

Source: own elaboration on the basis of the Ministry of the Interior and Administration.

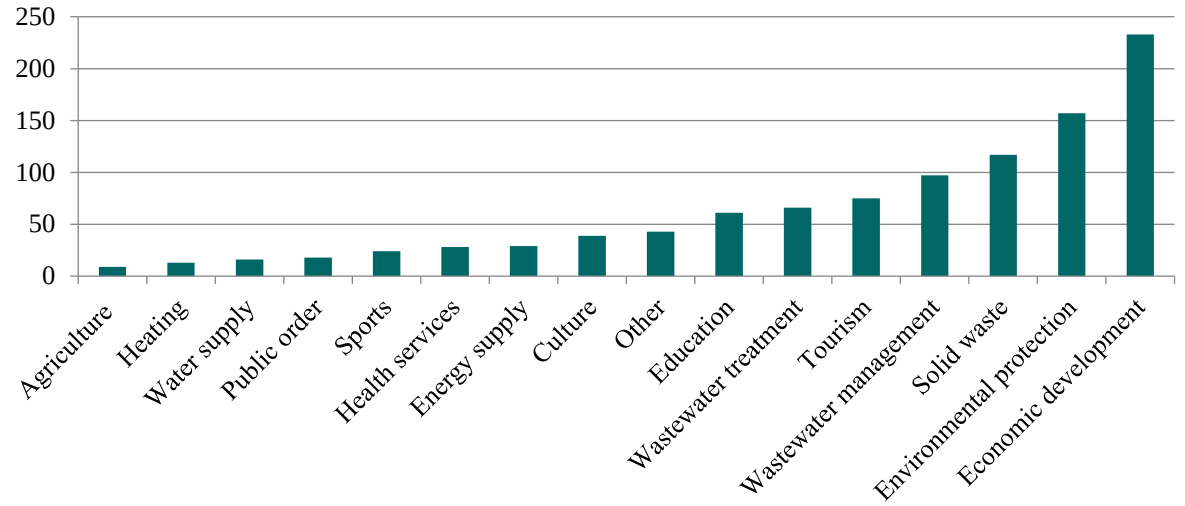

Figure 2. The number of inter-municipal unions and their tasks in 1990-2017

Source: own elaboration on the basis of the Ministry of the Interior and Administration.

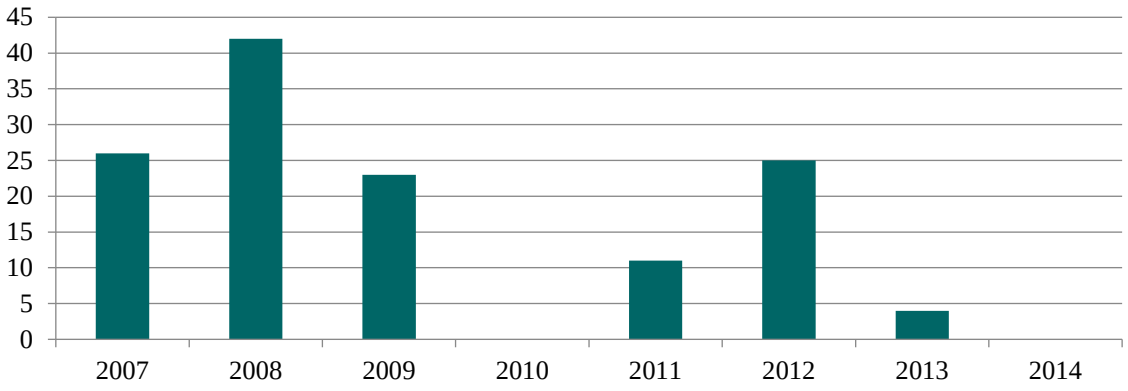

Figure 3. The number of municipalities that started cooperating in the field of LBD in 2007-2014

Source: own elaboration on the basis of the Ministry of the Interior and Administration.

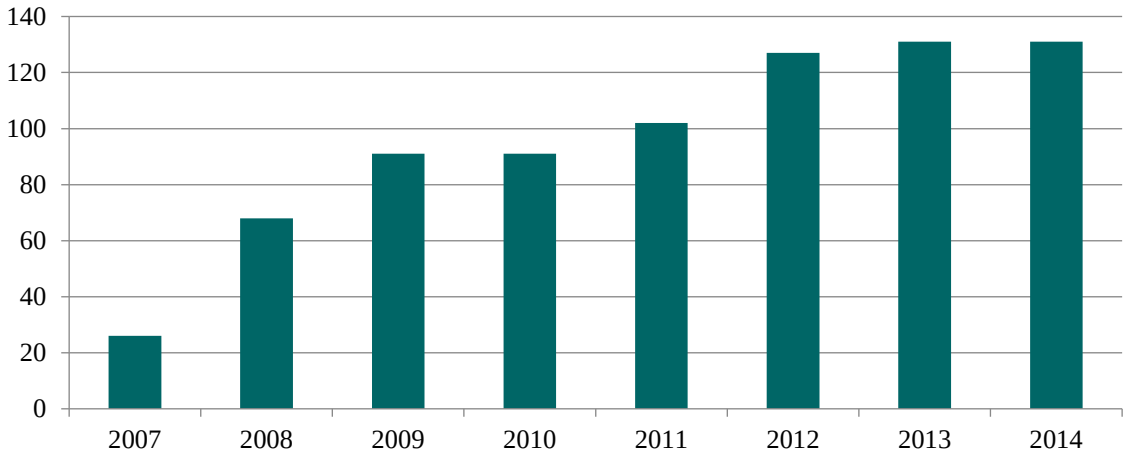

Figure 4. The cumulative number of municipalities that started cooperating in the field of LBD in 2007-2014

Source: own elaboration on the basis of the Ministry of the Interior and Administration.

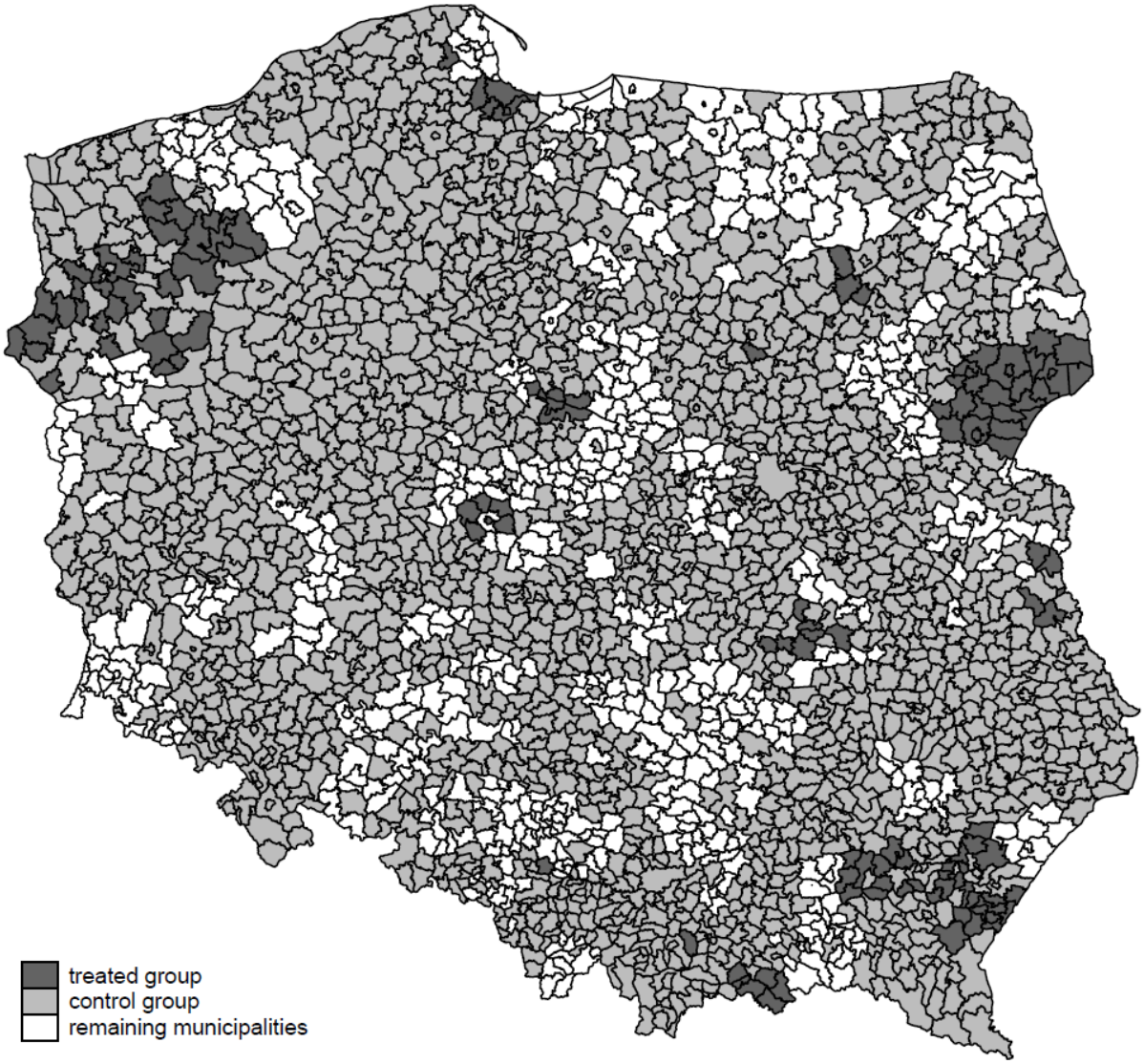

Figure 5. Municipalities in the treated and control group and remaining municipalities excluded from the analysis

Source: own elaboration on the basis of the Ministry of the Interior and Administration, the Cartographic Documentation Center and the Central Statistical Office Local Data Bank

Table 1: Variable description

Variable	Measure
Time invariant variables	
Rural	Dummy=1 if the municipality is located in a rural area
City with county rights	Dummy=1 if the municipality is a city with county rights
Area	Municipal area in square kilometres
Num. neighbors	Total number of neighbors
Region dummies	Dummy=1 if municipality m is located in region r
Time varying variables	
Population Size	Natural log of the total number of citizens
Population Growth	Growth rate of the municipal population
Unemployment rate	Ratio of unemployed to population at working age
Revenue Capacity	Natural log of per capita own revenue capacity calculated on the basis of 'de jure' revenues from the following sources: property tax, agricultural tax, forest tax, motor vehicle tax, civil law activities tax, tax on small businesses, stamp duty, and extraction fee
Exp. LBD	Natural log of municipal expenditures on LBD, per capita
Same party neighbors	The share of neighboring municipalities with the same party that obtained the highest support in previous parliamentary elections
Other cooperations	Number of other unions municipality m is part of in year t
SEZ	Dummy=1 if the municipality is part of a special economic zone in year t
IMC	Dummy=1 if the municipality is part of a union in year t
Neighbors in union	Number of direct neighbors that are in a union with m in year t
Union exp.	Natural log of union expenditures per capita, spent by m and its neighboring union partners
Exp. LBD union	Natural log of municipal expenditures per capita on LBD, spent by m and its neighboring union partners

Table 2: Sample baseline means for cooperating and non-cooperating municipalities

	Non-cooperating				Cooperating			
VARIABLES	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Urban	0.64	0.48	0	1	0.65	0.48	0	1
City with county rights	0.02	0.15	0	1	0.04	0.19	0	1
Area	124.54	75.5	3.32	573.96	144.66	87.45	16.17	484.77
Num. neighbors	5.73	1.81	1	18	5.48	1.91	1	11
Population Size	15133.64	54468.67	1549	1706624	14517.65	42445.6	1840	455717
Population Growth	0.11	1.13	-7.77	14.41	-0.28	1.95	-17.41	4.74
Revenue Capacity	581.22	825.39	150.85	30392.03	594.92	474.58	210.73	3764.87
Unemployment rate	8.57	3.52	1.95	25.03	9.78	3.75	2.39	19.19
Exp. LBD	205.17	240.1	28.75	7248.1	190.42	137.41	43.99	1091.14
Union expenditures	0	0	0	0	2.8	8.53	0	43.66
Share union exp.	0	0	0	0	0.02	0.07	0	0.39
EU-funds	106.48	140.63	22.15	2161.49	91.77	75.69	28.87	632.22
EU-investment	39.70	114.88	0	1861.38	24.43	59.31	0	471.06
Same party neighbors	0.46	0.31	0	1	0.54	0.36	0	1
Other cooperations	0.46	0.63	0	4	0.3	0.57	0	3
Number of municipalities	1,719				130			

Table 3: Inverse probability of treatment weights, not truncated and truncated

	Min.	1st Quartile	Median	Mean	3rd Quartile	Max
Not truncated	0.005	0.945	0.976	0.994	1.002	25.392
Truncated at 1st and 99th percentile	0.036	0.952	0.983	1.096	1.06	2.052

Table 4: Logit Regression Predicting Cooperation in Economic development (Odds ratios)

Time-invariant variables and variables at baseline		*Time-varying variables*		*Time-varying variables continued*	
Rural	1.340	IMC		Revenue capacity	
	(0.332)	At t-1	12,059***	At t-1	0.984
City with county rights	2.669		(9,214)		(0.422)
	(1.606)	At t-2	0.435	At t-2	1.107
Area	1.000		(0.325)		(0.617)
	(0.00118)	At t-3	10.65***	At t-3	1.054
Num. neighbors	0.997		(4.537)		(0.598)
	(0.0819)	Population size		Revenue capacity (sl)	
Other cooperations	1.123	At t-1	1.000*	At t-1	0.833
	(0.132)		(0.000157)		(0.546)
SEZ	0.219**	At t-2	1.000	At t-2	0.322
	(0.149)		(0.000188)		(0.234)
Population size	1.165	At t-3	1.000***	At t-3	1.333
	(0.236)		(0.000166)		(0.902)
Population size	1.000***	Population size (sl)		Exp.LBD	
spatial lag (sl)	(9.09e-06)	At t-1	6.883	At t-1	0.976
Population growth	1.262**		(54.48)		(0.208)
	(0.141)	At t-2	0.0151	At t-2	0.933
Population growth (sl)	1.585		(0.161)		(0.202)
	(0.478)	At t-3	8.231	At t-3	1.299
Unemployment rate	1.095		(49.03)		(0.242)
	(0.0861)	Population growth		Exp.LBD(sum neighbors)	
Unemployment rate (sl)	1.197*	At t-1	0.898*	At t-1	0.582
	(0.115)		(0.0576)		(0.211)
Revenue capacity	1.209	At t-2	1.042	At t-2	1.067
	(0.538)		(0.0763)		(0.401)
Revenue capacity (sl)	1.784	At t-3	0.872	At t-3	2.064**
	(1.341)		(0.0776)		(0.641)
Exp. LBD	0.868	Population growth (sl)		Same party neighbors	
	(0.149)	At t-1	0.380***	At t-1	0.559
Exp. LBD (sum neigh-	0.812		(0.0881)		(0.204)
bors)	(0.260)	At t-2	1.280	At t-2	1.085
Same party neighbors	2.311**		(0.202)		(0.500)
	(0.796)	At t-3	0.501***	At t-3	1.562
			(0.102)		(0.563)
		Unemployment rate		SEZ	
		At t-1	0.930	At t	0.992
			(0.0932)		(1.269)
		At t-2	0.987	At t-1	1.951
			(0.140)		(3.137)
		At t-3	1.008		
			(0.128)	Year Dummies	YES
		Unemployment rate (sl)		Region Dummies	YES
		At t-1	0.997		
			(0.122)	Constant	0***
		At t-2	1.186		(0)
			(0.170)		
		At t-3	0.709**	Observations	13,015
			(0.0962)		

Robust seEform in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5: The effect of IMC on unemployment rate and population growth. FE-Models

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	Unemploy-ment	Unemploy-ment	Unemploy-ment	Unemploy-ment	Unemploy-ment	Population Growth	Population Growth	Population Growth	Population Growth	Population Growth
IMC	-0.182					-0.106				
	(0.125)					(0.236)				
Neighbors union		-0.0768**					0.0286			
		(0.0360)					(0.0381)			
Union exp.			-0.0347					-0.0835		
			(0.0469)					(0.0691)		
Exp. LBD union				0.0339*					0.00797	
				(0.0191)					(0.0338)	
EU-investment union					-0.000530					0.00748
					(0.0185)					(0.0222)
Population size	0.940	0.969	0.979	1.100	1.030	-76.97***	-76.89***	-77.04***	-76.90***	-76.91***
	(1.326)	(1.322)	(1.323)	(1.316)	(1.319)	(3.233)	(3.323)	(3.214)	(3.286)	(3.342)
Exp. LBD	-0.0174	-0.0175	-0.0174	-0.0181	-0.0172	0.0255	0.0257	0.0251	0.0254	0.0255
	(0.0232)	(0.0232)	(0.0232)	(0.0233)	(0.0233)	(0.0191)	(0.0191)	(0.0191)	(0.0190)	(0.0191)
Exp. LBD (spatial lag)	-0.0193	-0.0191	-0.0190	-0.0186	-0.0174	0.0381	0.0397	0.0354	0.0389	0.0387
	(0.0412)	(0.0412)	(0.0411)	(0.0413)	(0.0413)	(0.0394)	(0.0402)	(0.0391)	(0.0408)	(0.0407)
Other cooperations	-0.203***	-0.202***	-0.175***	-0.174***	-0.166***	-0.0521	-0.0174	-0.0514	-0.0326	-0.0317
	(0.0526)	(0.0509)	(0.0491)	(0.0483)	(0.0487)	(0.0606)	(0.0432)	(0.0441)	(0.0428)	(0.0417)
SEZ	-0.203***	-0.202***	-0.175***	-0.174***	-0.166***	-0.0521	-0.0174	-0.0514	-0.0326	-0.0317
	(0.0526)	(0.0509)	(0.0491)	(0.0483)	(0.0487)	(0.0606)	(0.0432)	(0.0441)	(0.0428)	(0.0417)
Constant	0.618	0.355	0.250	-0.867	-0.228	696.0***	695.3***	696.7***	695.4***	695.5***
	(11.99)	(11.95)	(11.96)	(11.90)	(11.93)	(29.33)	(30.17)	(29.16)	(29.85)	(30.36)
Observations	14,904	14,904	14,904	14,904	14,904	14,936	14,936	14,936	14,936	14,936
R-squared	0.682	0.682	0.681	0.682	0.681	0.614	0.614	0.615	0.614	0.614

Year dummies and municipal-specific linear time trends included in all models. N=1,881. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6: The effect of IMC on unemployment rate and population growth. MSM-Models

Variables	(1) Unemploy-ment	(2) Unemploy-ment	(3) Unemploy-ment	(4) Unemploy-ment	(5) Unemploy-ment	(6) Population Growth	(7) Population Growth	(8) Population Growth	(9) Population Growth	(10) Population Growth
					Non-truncated weights					
IMC	0.944***					-0.115				
	(0.308)					(0.101)				
Neighbors union		0.281*					-0.0374			
		(0.167)					(0.0716)			
Union exp.			0.365***					0.0309		
			(0.119)					(0.0781)		
Exp. LBD union				0.0846*					-0.00782	
				(0.0471)					(0.0148)	
EU-investment union					0.0933*					-0.00949
					(0.0567)					(0.0171)
Constant	6.541***	7.286***	7.374***	7.200***	7.043***	-4.831***	-4.919***	-4.940***	-4.916***	-4.898***
	(1.583)	(1.891)	(1.965)	(1.885)	(1.828)	(0.731)	(0.749)	(0.760)	(0.753)	(0.747)
Observations	1,632	1,632	1,632	1,632	1,632	1,643	1,643	1,643	1,643	1,643
R-squared	0.744	0.740	0.740	0.740	0.740	0.407	0.406	0.406	0.406	0.406
					Truncated weights					
IMC	0.511					-0.0186				
	(0.314)					(0.0904)				
Neighbors union		0.0957					0.000400			
		(0.126)					(0.0657)			
Union exp.			0.303***					0.0220		
			(0.103)					(0.0692)		
Exp. LBD union				0.0377					0.00239	
				(0.0416)					(0.0139)	
EU-investment union					0.0246					0.00552
					(0.0485)					(0.0157)
Constant	6.522***	6.611***	6.556***	6.559***	6.557***	-4.544***	-4.547***	-4.551***	-4.550***	-4.558***
	(1.442)	(1.456)	(1.454)	(1.455)	(1.457)	(0.743)	(0.743)	(0.744)	(0.743)	(0.743)
Observations	1,884	1,884	1,884	1,884	1,884	1,896	1,896	1,896	1,896	1,896
R-squared	0.728	0.727	0.728	0.727	0.727	0.423	0.423	0.423	0.423	0.423

Control variables at baseline: Population size, population growth, unemployment rate, shares in revenue capacity, Exp.LBD, SEZ, same party neighbors, other cooperations. Time-invariant controls: Rural, city with county rights, area, num. neighbors. Robust standard errors in parentheses, clustered on municipal level
*** p<0.01, ** p<0.05, * p<0.1

Table 7: The effect of IMC on neighborhood unemployment rate and population growth. FE-Models

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variables	Unemploy-ment	Unemploy-ment	Unemploy-ment	Unemploy-ment	Unemploy-ment	Population Growth	Population Growth	Population Growth	Population Growth	Population Growth
IMC	-0.132					0.121***				
	(0.0921)					(0.0470)				
Neighbors union		-0.0458					0.0375**			
		(0.0305)					(0.0150)			
Union exp.			-0.0439					0.0178*		
			(0.0337)					(0.0106)		
Exp. LBD union				0.0298**					0.0336***	
				(0.0141)					(0.00750)	
EU-investment Union					-0.00660					0.00618
					(0.0136)					(0.00652)
Population size (neighborhood)	3.484***	3.485***	3.524***	3.544***	3.538***	-18.08***	-18.08***	-18.12***	-18.10***	-18.13***
	(1.174)	(1.175)	(1.169)	(1.172)	(1.172)	(1.506)	(1.505)	(1.502)	(1.511)	(1.504)
Exp. LBD (neighborhood)	-0.0186	-0.0181	-0.0200	-0.0231	-0.0188	0.0653***	0.0650***	0.0664***	0.0620***	0.0656***
	(0.0341)	(0.0341)	(0.0341)	(0.0343)	(0.0342)	(0.0220)	(0.0220)	(0.0219)	(0.0220)	(0.0220)
Other cooperations	-0.155***	-0.150***	-0.139***	-0.136***	-0.128***	0.00561	-0.00141	-0.0145	-0.0264	-0.0196
	(0.0384)	(0.0367)	(0.0347)	(0.0344)	(0.0347)	(0.0279)	(0.0265)	(0.0252)	(0.0251)	(0.0249)
SEZ	0.104	0.105	0.107	0.110	0.105	0.0122	0.0112	0.0101	0.0150	0.0112
	(0.0769)	(0.0769)	(0.0771)	(0.0771)	(0.0770)	(0.0617)	(0.0617)	(0.0619)	(0.0618)	(0.0619)
Constant	-22.41**	-22.42**	-22.77**	-22.95**	-22.90**	161.9***	161.9***	162.3***	162.1***	162.4***
	(10.53)	(10.54)	(10.49)	(10.51)	(10.52)	(13.52)	(13.51)	(13.49)	(13.57)	(13.50)
Observations	14,833	14,833	14,833	14,833	14,833	14,936	14,936	14,936	14,936	14,936
R-squared	0.752	0.752	0.752	0.752	0.751	0.696	0.696	0.696	0.697	0.696

Year dummies and municipal-specific linear time trends included in all models. N=1,881. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 8: The effect of IMC on neighborhood unemployment rate and population growth. MSM-Models

Variables	(1) Unemploy-ment	(2) Unemploy-ment	(3) Unemploy-ment	(4) Unemploy-ment	(5) Unemploy-ment	(6) Population Growth	(7) Population Growth	(8) Population Growth	(9) Population Growth	(10) Population Growth
					Non-truncated weights					
IMC	0.809***					0.0170				
	(0.266)					(0.0366)				
Neighbors union		0.250					-0.0148			
		(0.155)					(0.0250)			
Union exp.			0.290***					-0.0114		
			(0.0766)					(0.0265)		
Exp. LBD union				0.0588					0.00863	
				(0.0369)					(0.00554)	
EU-investment					0.0735					0.00779
Union					(0.0466)					(0.00612)
Constant	7.338***	7.977***	8.057***	7.936***	7.791***	-1.836***	-1.814***	-1.819***	-1.843***	-1.852***
	(1.377)	(1.666)	(1.757)	(1.688)	(1.616)	(0.319)	(0.324)	(0.325)	(0.327)	(0.325)
Observations	1,612	1,612	1,612	1,612	1,612	1,643	1,643	1,643	1,643	1,643
R-squared	0.761	0.757	0.757	0.757	0.757	0.640	0.640	0.640	0.641	0.641
					Truncated weights					
IMC	0.378					0.0240				
	(0.241)					(0.0349)				
Neighbors union		0.0404					-0.0202			
		(0.0988)					(0.0270)			
Union exp.			0.200***					-0.0108		
			(0.0635)					(0.0240)		
Exp. LBD union				0.0168					0.0122**	
				(0.0327)					(0.00535)	
EU-investment					0.0103					0.0116*
union					(0.0387)					(0.00597)
Constant	7.477***	7.540***	7.504***	7.517***	7.517***	-1.786***	-1.784***	-1.781***	-1.797***	-1.805***
	(1.262)	(1.272)	(1.272)	(1.270)	(1.270)	(0.307)	(0.307)	(0.307)	(0.308)	(0.308)
Observations	1,856	1,856	1,856	1,856	1,856	1,896	1,896	1,896	1,896	1,896
R-squared	0.759	0.759	0.759	0.759	0.759	0.635	0.635	0.635	0.636	0.635

Control variables at baseline: Population size, population growth, unemployment rate, shares in revenue capacity, Exp.LBD, SEZ, same party neighbors, other cooperations. Time-invariant controls: Rural, city with county rights, area, num. neighbors. Robust standard errors in parentheses, clustered on municipal level
*** p<0.01, ** p<0.05, * p<0.1

Appendix

Table A.1. Tasks executed by inter-municipal unions included in each field according to the official register of Ministry of the Interior and Administration

Agriculture	tests and certification of agricultural products
	purchase and processing of agricultural products
	agro-food investments and restructuring
	agriculture protection
	development of the agricultural market
	agriculture development
	plant and animal production
Culture	care of monuments
	culture
LBD	construction and development of a telephone network
	telecommunication
	infrastructure investments
	support, development and dissemination of the local government
	promotion of municipalities
	development of rural areas
	promoting sustainable development
	collection and processing of information about social and economic development
	social and economic development
	initiatives to equalize the standard of living
	economic cooperation and regional policy
	construction and investing in objects related to the activity of the union
	obtaining domestic and foreign funds
	spatial development planning and spatial order
	land management
	thermo-modernization of public utility buildings
	development of IT infrastructure
	limiting unemployment
	programs of increasing employment of disabled people
	public works
	electronic public services
	issuance of electronic money
	provision of payment services as a national electronic money institution
	creation of a border crossing
	airport construction
	airport services
	cycle paths
	interregional public roads
	local public transportation

	maintenance and operation of the airport
	public municipal roads
	traffic and parking
Education	environmental education
	education
	development of educational infrastructure
	pre-school education - alternative forms
	setting up and running primary schools, lower secondary schools and kindergartens
Energy supply	gasification (gas networks construction and maintenance)
	gas supply
	energy management
	electricity supply
	energy network construction and maintenance
Environmental protection	rainwater channels, sewerage ditches and urban drainage
	melioration
	retention reservoir
	removal of asbestos-containing products
	sustainable energy management
	development of energy production based on renewable sources
	management of natural resources
	preventing degradation and devastation of the environment caused by industrial development
	environmental protection
	development plans in the field of environmental protection
	promoting of ecological agriculture
	forestry and hunting
	creating programs against natural disasters
	flood protection
	fire protection
	collection, operation and processing of construction aggregate
Health services	health services
	health protection
	health infrastructure
	social care for people with disabilities
	running inter-communal Care Center for the elderly people
	social care
	violence in the family counteracting
	alcoholism counteracting
	drug addiction counteracting
Heating	heating supply
	renovation and maintenance of heating infrastructure
	investment in heating infrastructure
Public order	cleanliness and order maintenance

	public order and security
	civil defence
Solid waste	waste management and disposal
	construction, operation and reclamation of landfills
	construction and maintenance of waste treatment plants
Sports	sport and recreation
	coordination of activities regarding the award of winter organization of the Olympic Games to Poland
Tourism	tourism
	hotel services
Waste water treatment	waste water treatment
	maintenance of sewage treatment plants
	sewage treatment plants - modernization and construction of new ones
	farm wastewater treatment plants - encouragement and initiation of constructing
Wastewater management	wastewater management
	wastewater disposal
	construction of and investments in sewerage networks
	renovation and maintenance of sewerage networks
Water supply	water search, water intake construction and well drilling
	water management
	water supply
	construction of and investments in water supply networks
	renovation and maintenance of water supply networks
Other	development of administrative infrastructure
	training
	cemeteries
	animal shelter, providing care to homeless animals and catching them
	neutralization of corpses of dead animals
	local marketplaces
	keeping deposit and customs warehouses

Source: own elaboration on the basis of the Ministry of the Interior and Administration.