PERPETUAL INFLUENCE OF EMPIRES: EVIDENCE FROM POLISH MUNICIPALITIES

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Abstract: Does history matter? More specifically, does history matter for fiscal outcomes. In the context of Polish municipalities the answer is positive. To prove it, this paper exploits a natural experiment, which was provided by Poland's partition. After Poland lost its independence in 1795, its territory was divided between three empires – Prussia, Russia, and Austria-Hungary – and was governed by foreign institutions, and was influenced by culture and norms of these countries for more than 120 years. By means of spatial regression discontinuity, it is shown that municipalities from the former Prussian empire impose contemporarily higher property tax rates as compared to municipalities exposed to the Russian ruling. Higher property tax rates lead to larger own revenue, higher fiscal autonomy, and consequently, to smaller vertical fiscal imbalance in the municipalities belonging to former Prussian partition. Discontinuity in the property tax rates is not observed at the Russian-Austrian border. Paper offers potential explanations for the discontinuity at the Prussia-Russia border and lack thereof at the Austria-Russia border.

Keywords: property tax, vertical fiscal imbalance, regression discontinuity

JEL classification: H71, H77, K34

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1. Introduction

Does history matter? Do institutions, customs and norms have a persistent effect? Do institutions of former conquerors have any long-lasting effects on countries which regained their independence? Particularly in the context of Poland, many historians tend to answer to these questions affirmatively. In 1795 three empires – Prussia, Russia and Habsburg monarchy (Austria-Hungary, hereinafter Austria) – completed the third and last partition of the Commonwealth of Poland and Lithuania (hereinafter Poland). After the third partition, Poland and its institutional environment ceased to exist for 123 years – a period of roughly five generations. Conquerors' institutions were subsequently transplanted, i.e. Prussian institutions in the North-West, Russian institutions in the East and Austrian institutions in the South-East (see figure 1). However, besides the length of empires' influence what is also crucial is the timing of this influence. Europe of the 19th century experienced numerous events, which changed the face of the old continent. This was the time of development of national identities, modern states and their institutions such as legal systems and constitutions. Moreover, the economic and social foundations were rapidly changed by the Industrial Revolution and abolishment of serfdom.

There is a wide consensus among historians that empires varied significantly in their policies toward Polish territories. For more than a century, Poles living in different territories were therefore exposed to significantly different institutions, customs and norms. As a result, Polish population – particularly one located close to the newly established empires' borders – could be considered as being subject to a large-scale 'institutional and cultural experiment'. Since the partition borders were rather an outcome of political bargaining and were irrelevant with respect to the conditions on the ground, the assignment of subjects in this partition experiment was random. Given this empirical framework, the underlying question is whether the differences in institutional performance observed under empires can be transmitted through centuries and shape outcomes in today's Poland. In other words, it is to verify whether past experience with different institutions continue to influence outcomes contemporarily, that is, to produce a kind of path dependence of outcomes.

In a recent paper, Grosfeld and Zhuravskaya (2015) provided evidence of some ideological and customary differences at the borders of the former empires. For instance, the authors demonstrate variations in the religious practices (attending mess) and beliefs in democratic institutions at the partition borders. They also

find that empires have an effect on the political outcomes in the modern Poland. Precisely, vote for post-communist party in the parliamentary election is systematically higher in the municipalities from the former Russian occupation. Despite the common wisdom, Grosfeld and Zhuravskaya do not find, however, any differences in economic development between municipalities occupied by the three empires. Nonetheless the authors find some systematic difference in the density of the train network between Prussian and Russian occupations. Difference in 'hard' infrastructure seems to be hence persistent.

Figure 1. Borders between Prussian, Russian and Austrian empires established after Vienna Congress in 1815

Source: bezgranica.pl (accessed on December 27, 2014).

This paper is novel as it is predominantly interested in revealing whether there are any differences in the area of fiscal policy between municipalities belonging to the different empires. The attention is given to the institution of property tax as municipalities in Poland have large autonomy in setting rates of this tax subject to ceiling imposed by the Ministry of Finance. Specifically, it is argued here that partitions are

responsible for differing property tax rates (high in Prussian part and low in Russian part), and resulting policy outcomes, such as fiscal autonomy and vertical fiscal imbalance (VFI). The latter variable is measure as share of spending covered from external resources such as subsidies and loans and it approximates the soft budget constraints of municipalities. High reliance on intergovernmental transfers induces moral hazard on the side of states and distorts their tax enforcement (Baretti et al. 2002). According to Rodden (2003), 'transfer-dependent municipalities face weak incentives to be fiscally responsible, since it is more rewarding to position themselves for a bailout'. Municipalities endowed with high transfers from the federal level typically do not have sufficient tax authority to cope with idiosyncratic economic shocks (von Hagen and Eichengreen, 1996). Since resources anyway come mainly from central transfers, municipalities may claim that they are not responsible for coping with the crisis and, thus, shift the burden to the central level and derail the position of the whole general government. As recently shown by Eyraud and Lusinyan (2013), vertical fiscal imbalances are positively associated with deficit of the general government. It does not come as a surprise as local governments with high imbalance are likely to externalize the negative consequences of their fiscal policy to the central government.

This paper does not only show that the difference in property tax rates and resulting fiscal outcomes between municipalities due to partition of Poland exists. Yet, it also presents the most probable transmission channels explaining the differences. Three transmission channels are underscored as possibly explaining why in the former Prussian municipalities the property tax rates should be higher and, consequently, vertical fiscal imbalance smaller as compared to Russian and Austrian partition. First, empires differed a lot with respect to the tax system imposed and functioning of cadaster[2], with Prussian tax administration and cadaster being the most developed, particularly when property taxes are considered. Moreover, in the Prussian partition the property tax was local in nature and not imposed by the central government, differently than in Austrian and Russian parts were property tax was a competence of central tier of government. Both the effectiveness and localness of property tax could shape the perception and, hence, willingness to pay this tax. The second transmission channel relates to institutions and cultural traits influencing the tax morale, such as for instance religiosity and social capital. Tax morale is relevant forasmuch as public authorities might be more willing to impose high tax burdens on individuals with high tax morale (Dorrenberg et al. 2014). Individuals with high tax morale face high costs of evading taxation, and therefore are less responsive to higher taxes. Given that particular institutions and norms persisted over a century, it is expected to observe the highest tax morale and, thus, property taxes in the Prussian partition. The third transmission channel is linked to infrastructural differences of land and building properties. These infrastructural differences due to variances in water, electricity and gas supply as well as

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[2]   Should cadastre be explained?

sewerage might influence the value of the property. Given the infrastructural differences, public authorities might levy higher taxes on more valuable land and buildings, i.e. these with municipal service providers. Based on this argumentation it is yet again expected to observe the highest property tax rates in the former Prussian partition as historically this partition was the most developed in terms utilities supply. All channels and their interactions might have some merit in explaining the difference in the property tax rates and fiscal policy outcomes in Polish municipalities nowadays. Yet, as it is argued later in the paper, the most robust seems to be the first channel.

The current paper analyses the difference in fiscal institutions and outcomes between municipalities exposed on Prussian, Russian and Austrian governance. However, the largest effects are presumably to be found at the Prussian-Russian border. At this border the socio-economic and institutional differences were the most encompassing. 'Prussian Poland' was not only much more industrialized than the 'Russian Poland' but there were also huge differences in the access to education, efficiency of public administration (also in taxation and cadaster), religiosity, urbanization, centralization of power, agriculture reform and social capital. Although it should be acknowledged that political and cultural freedom of Poles in Prussian was not that high as under Austrian ruling. However, Prussian oppression was not that severe as Russian under which many freedom-seeking Poles lost their lives in Siberia. Even though a special attention is brought to the Prussian-Russian, the results for the Austria-Russian border are also reported and they serve as a robustness or placebo check. At the Austria-Russia border, there should be no differences in property tax rates or at least these differences should be much smaller that these observed at the Prussian-Russian border. Due to a limited number of observations, this paper does not report the results for the Austria-Prussia border. This border was the shortest and the least stable.

Similarly to Grosfeld and Zhuravskaya (2015), the current paper employs a spatial regression discontinuity design (RDD), which allows testing for a break (jump) in the outcome variables exactly at the border between the former empires. RDD relies on the fact that the partition borders between emperies were imposed exogenously. Borders were the consequence of the political bargaining and were set – at least to some extent – arbitrarily. Importantly, the drawing of the border was neither pursued according to any geographical feature of the land, nor according to economic development at that time. An assumption of exogeneity of the border is crucial and it allows inferring causality. Under this assumption any sharp break in the outcome variable at the partition border should be interpreted as a causal effect of the partitions. RDD offers a clean evaluation of the historical legacies, simply because estimates are not blurred by omitted variables and self-selection. Importantly, the partition borders established by the Vienna Congress

in 1815[3] coincides neither with the borders of the previous Polish-Lithuanian Commonwealth, nor with the borders of the newly established Polish state in 1918 and then in 1945 (see figure A1 in appendix 1). This substantiates the result as the partition border is not confounded by any other frontier and can be uniquely subscribed to the effect of empires. To further strengthen the causal inference, the analysis is confined to the territories with relatively steady conditions on both sides of the Prussia-Russian and Austria-Russia borders before and after the partition. For instance, areas which experienced huge population shifts such as North part of Poland (namely Mazuren) and New Territories (Pommern) and Lower Silesia (Niederschlesien) are explicitly excluded from the analysis (see appendix 1).

This paper adds to a recently growing body of empirical literature that points toward important long-term effects of historical events on currently observed economic outcomes (Nunn, 2009). For instance, early studies such as La Porta et al. (1998), Acemoglu et al. (2001) as well as Engerman and Sokoloff (2002) document the lasting impact of Europe's colonization on the development paths of former colonies. More specifically, they look at the impact the colonial rule had on the domestic institutions that persisted after the colonized countries became independent. Dell (2010) is an important contribution on the methodological ground. By utilizing the RDD, it finds an effect of forced mining labour in Peru and Bolivia in the period 1573-1812 on household consumption and the prevalence of stunted growth in children.

Although, historical determinants of institutions in the former European colonies received most of the attention, the persistence of empires' legacies in Europe was also researched. For instance, Becker et al. (2011) argue that populations of territories previously occupied by the former Habsburg monarchy display on average higher trust in government institutions than territories which did not experience the Habsburg's ruling. A lot of empirical research uses the German context to study long-term persistence of institutions and customs. For example, Voigtländer and Voth (2012) analyse historical roots of anti-Semitism in interwar Germany. They show the persistence of interethnic hatred as medieval pogroms of Jews appeared to be a good predictor of the Nazi party's share of vote in 1928. Also Schumann (2014) shows the persistent difference in the size of the population between the German municipalities occupied by France and the US after the Second World War. Contrary to the US, France refused to admit German expellees who were forced to resettle after new borders were set after the war. This setting allows for quasi-experiment at the former borders of occupational zones. Furthermore, Hornung (2014) finds substantial long-term effects of Huguenot settlement in the 17th century on the productivity of textile manufactories in the 19th century. For the Italian context, Guiso et al. (2013) constitutes an important input. It finds that

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[3]   Although the three empires annexed Poland already in 1795, the final frontiers among them were set only in 1815.

today's notable differences in civic capital between the North and South of Italy are the legacy of the medieval free city-state experience of the Middle Ages.

Persistence of historical institutions in the Polish context – besides Grosfeld and Zhuravskaya (2015) – was studied by Wysokińska (2011). She documents higher average generalized trust, voter turnouts and economic development on the Prussian side of Prussia-Russia border in contemporary Poland. Although the current paper employs methodological design from Grosfeld and Zhuravskaya (2015), it differs significantly with respect to the phenomenon it tries to explain. To the author's knowledge, this is the first paper attempting to isolate history's influence on the fiscal institutions, namely property tax rates.

The paper proceeds as follows. Section 2 gives a short description of property tax regime in Poland as well as it gives a brief historical overview of institutions in the former Prussian, Russian and Austrian empires and derives main hypotheses along with transmission channels. The data and empirical method applied in the paper – namely spatial RDD – are described in section 3. The baseline results on effects of empires on property tax rates are subsequently demonstrated and discussed in section 4. Section 5 presents results on further fiscal outcomes, such as fiscal autonomy and VFI. Lastly, section 6 concludes and derives avenues for future research.

2. Institutional background, historical framework and hypotheses

By international standards, Polish municipalities enjoy moderate or moderately high fiscal autonomy. On the expenditure side, there are responsible for a provision of important public goods and services, such as primary education, health care, public transportation, police services, local public transportation, among others. On the revenue side, Polish municipalities are eligible to shares of personal and corporate incomes taxes levied on their territories. Yet, municipalities are also allowed to set rates of selected types of taxes, of which property tax is the most important. Property tax income constitutes approximately 10% of all municipal revenue in Poland – the largest share considering taxes imposed by the municipalities and similar to revenue from personal income tax, to which municipality is eligible.

Considering property tax, municipalities are free to set the tax rates on land and building property up to the ceiling established by the Ministry of Finance, which amends the rates on the yearly basis. Property tax ceilings on buildings are higher, however, then these on land giving more leeway to the municipalities to levy these taxes. There are two main categories of taxpayers of the property tax: individuals and

companies. The maximum rates on individuals are 0.73 PLN per square meter for residential building and 0.45 PLN per square meter of land. Companies, on the other hand, are charged with a maximum of 22.82 PLN per square meter of building space and 0.88 PLN per square meter of land.

An underlying question of this paper is whether the empires' legacy can explain the differences in the tax rate of property taxes levied contemporarily by the municipalities in Poland. Three transmission channels are described that can potentially explain path-dependence between empires legacy and current fiscal outcomes.

First, it is argued that the initial property tax institutions imposed by empires shaped the perception about property taxes differently and this differing perception persisted over centuries. Poles in different empires had different reference point regarding the property tax institution, which shaped their perception and preferences (Kahnemann, 1992). Perception and preferences over property taxes could, in turn, persisted over time through the intergenerational transmission. Yet, what are these differences in perception and preferences for property taxes? Before the partition of Poland, the property tax was known under the name of 'chimney' tax (*podymne*) and it was imposed centrally on housings possessing chimney. Chimney tax was abolished and replaced by various institutional arrangements of the conquerors after partitioning of Poland. The most modern property tax system was established in 'Prussian' Poland, where this tax together with income tax generated the largest share of state's budget income. In other parts, i.e. Russian and Austrian partitions, the indirect taxes were prevailing, particularly these on consumption, such as an excise. In Prussia, the property tax system was also the most formalized and had more local character as compared to the property tax regimes in Russian and Austrian parts. Local character of the Prussian system relied on the fact that property taxes were set and levied by the municipalities themselves and income from these taxes constituted own income of municipalities (Cywińska et al., 2009; Stankiewicz, 2013). Taxpayers could be more willing to pay these taxes knowing that revenue from this tax is spent locally and is not just a contribution to the general (central) tax fund. The larger formalization of the property tax in Prussia steamed from the fact that tax rates were set based on the cadastre (both land and building cadastre[4]). Cadastre contains a detailed description (measures and maps) of all lands and capital inventory which is located on the land, and hence contains the information on the estimated value of the property, which serves as a basis to set property tax. Cadastre facilitated acquisition of the land and buildings as property rights were clearly defined, increasing a legal certainty of the transactions. Cadastre also facilitated the procurement of credits and loans as cadastre eases the estimation of the value of the property which can be

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[4] Historically, a rationale for the establishment of cadastre was to properly define the borders/limitations of the property rights. In the ancient Rome, only this property was respected in a legal sense which was measured

used as collateral. Taxpayers might be more willing to pay property taxes knowing that their property rights are better defined, protected and more easily transferable. In contrast to the Prussian partition, in Austria and in Russia, property taxes were set centrally and, particularly in Russia[5], they were not based on the cadastre (in Austria only land cadastre was established, not the building cadastre) (Centralne Stowarzyszenie Państwowych Inżynierów Mierniczych we Lwowie, 1933; Mika 2010). Higher legal certainty over the property in Prussian part could hence increase the willingness to pay property taxes. Although after regaining the independence in 1918, much effort was put to unify the property tax system in Poland, a lot of institutional differences persisted until the mid-1940 (Stankiewicz, 2013). After 1918, some legal harmonization was achieved with respect to property tax regime in former Austrian and Russian partitions, while the Prussian system remained quite distinct until after the World War II. Unification of property tax system was accomplished by the socialist regime, which introduced in 1951 standardized and centrally set property tax rates across the country both for land and buildings. Current property tax system was established after restoring the democracy in 1991.

Based on this discussion, it is hypothesized that today's property tax rates are higher in the municipalities from the former 'Prussian' Poland than in municipalities with Russian and Austrian legacy. Different property tax regimes imposed by empires served as reference points shaping people's perception and preferences for property taxes, which were transmitted vertically from generation to generation. In municipalities with Prussian legacy, taxpayers should have persistently more positive perception of property taxes than in Russian and Austrian parts because the Prussian tax system had more local feature (taxpayers could internalize the benefit of this tax) and was based on the cadastre which enhanced legal certainty over the property. This more positive perception towards property tax in Prussia is then reflected in willingness to pay higher taxes on properties.

While the first argument refers to institutional differences in property taxation among empires, the second argument relates to other institutional and cultural traits – beyond the tax system itself – that can influence the tax morale. Recent literature on tax morale investigates the determinants of people's willingness to pay taxes.[6] Among others, it is claimed that income, religiosity, education, generalized trust (Torgler, 2007; Torgler and Schaltegger XXX; Torgler and Schneider, 2007), efficiency of public administration (Barone and Mocetti, 2011) are positively associated with tax morale. According to Doerrenberg et al. 2014, there are three main reasons why higher tax morale might be associated with higher tax rates: (1) to minimize tax distortions and tax evasion public officials levy high rates on groups with less elastic responses to tax

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[5]   Moreover, in Prussia the property tax on buildings was introduced already in 1861 – much earlier than in Russian part of Poland, where the property tax on building was introduced at the outset of the 20th century.

[6]   It is not an abstract idea not to comply with property taxes.

rates changes (high tax morale individuals) and lower rates on groups with elastic responses (low tax morale individuals); (2) politicians facing re-election might impose higher taxes on high tax morale groups since these groups oppose less high rates and, hence, it is less politically costly to charge them with high rates; (3) imposing high rates on high tax morale groups is also cost-efficient as it requires less enforcement costs to collect tax income from groups with high tax morale.

Based on the historical account of institutional and cultural differences between empires, one can hypothesize that in Prussian municipalities individuals have higher tax morale as compared particularly to municipalities with Russian legacy. The following differences could have implications for tax morale and, hence, for the level of property tax rates.

Economic development and income: Prussia industrialized its territories earlier than both Russia and Austria. But the differences were also visible in the scale and depth of industrialization which had an important effect on the economic development in Poland. Consequently, at the outset of I World War – after which Poland regained independence – the income of Poles from Prussian territory was 79% higher than of Poles from Russia and more than twice than in the Austrian partition (Zdrada, 2005; Wolf, 2007).

Education: Also the systems of education differed in the empires. In the Russian part of Poland there was no compulsory secondary education and as a result at the beginning of the 20th century, on average, children spend 3-4 years in schools. In the Prussian partition, eight years of education were compulsory and strictly enforced. In Austria, school lasted six years in rural regions and seven years in urban areas. Consequently, illiteracy rates varied sharply across partitions: 65% in the Russian partition, 56% in Austrian part and 0.6% in the Prussian partition. The Prussian education system was superior not only vis-à-vis the Russian and Austrian systems but was also path-breaking for the Western world at that time. In Prussia, there was one teacher for every six pupils. In France this ratio was 1:9 and in Russia 1:66 (Wysokińska, 2011).

Public administration: In Prussia, Poles were exposed to the administration (including judiciary) that was efficient, honest, disciplined and predictable and based on universal and impersonal rules (Davies, 1991; Davies, 2001). Similar type of administration was also present in the Austrian partition. Poles under the Russian rule, on the other hand, were often subject to inefficient and corrupt administration without rule-of-law guidelines. In Prussia, administration was mostly in the German hands. In Russia, 58% of the administrative employees were Poles, yet they were characterized by a high degree of conformism and loyalty toward Russian regime. The

administration was tightly controlled by the State by means of police and army, even the clerks were dressed in military uniforms.

Social capital (trust) and religiosity: The Russian empire was the most oppressive to Poles among the three empires. The Polish land was never treated equally to other Russian territories. Rather colonial type of relations prevailed, with Polish territory constituting a buffer between the West and the East. The reason was purely strategic as the Napoleonic invasion was still vividly remembered in Russia. Polish territories were under full control of the Russian *Tsar*, who pursued policies aimed at full standardization, conformity and assimilation without regard to the Polish culture and traditions. The Polish language was forbidden and teaching was entirely in Russian. After the January 1863 uprising, Russian authorities reacted violently. Consequently, Poles under the Russian administration did not have any opportunity to formalize their activities in associations and social networks. The main political and social activity was of a conspirational type, with underground political structures, organizations and press. A constant police surveillance, censorship and tight control of the western borders led to the isolation of the region. Russification was violently opposed by Poles as in the Poles eyes the Russian power represented a backward, uncivilized regime. In contrast, the effect of Germanization on Poles was more complex. It created tension between the wish to preserve Polish national identity and the recognition of the efficiency of the German political and economic institutions, law and modernization (Hryniewicz, 2003). Importantly, the Prussian constitution granted equality in terms of law, personal freedom of religion, education, association and press. Therefore, Poles often successfully appealed on the decisions which violated their rights in independent Prussian courts. The possibility to fully participate in a social and economic life, boosted economic and social self-organization of Poles and led to the creation of numerous formal and informal associations (Bielecka, 2006). It is of note also that Poles had some representation in the Prussian Landtag (parliament). Therefore, at least formally they could demand more rights for the Polish population. The conditions of Poles deteriorated after the introduction of *Kulturkampf* in 1871 (Davies, 1991; Davies, 2001). For a short period of time, the Prussian occupation became culturally and politically more oppressive towards Poles. The *Kulturkampf* of 1871 introduced limitations on the practice of religion and state supervision of the church internal affairs. German education became mandatory, geographical names were changed, and catholic monasteries and convents were closed. In contrast to the Prussian and Russian parts, in Austria Poles were subject to the most liberal law. The Habsburgs gave unprecedented administrative and cultural autonomy to their Polish territories. From this discussion it should be clear that social capital and religiosity of Poles in the previously Prussian and Austrian regions should be higher than in the Russian partition. The reason for that is that Poles from Austrian and Prussian partitions got wide range of rights of

self-organization and ensuing formation of associations. Poles from Prussian and Austrian partition also experienced personal freedom of religion. In the 'Russian Poland' religious organization (particularly Catholic Church) were annihilated.

Given that these institutional and cultural differences among partitions persisted, it could be argued that tax morale is the highest in the Prussian partition, moderate in the Austrian partition and rather low in Russian partition. Levying higher taxes from high tax morale individuals have both economic and political economy rationale. It is particularly higher taxes should be imposed on individuals that are less likely to evade taxes and less likely to punish parties politically by voting them out of the office when taxes are increased.

The third argument relates to the extent of utility supply at the properties from former Prussian, Russian and Austrian partitions. In Prussia, the utility supply, such as water, gas, sewerage, was the most extensive, i.e. the share of population using these utilities was the largest (Jezierski and Leszczynska, 2003). The extent of utility supply is crucial because it could impact the value of the property – with more utility supply resulting in higher value – and legitimize higher taxes in case of higher value properties. If the differences in utility supply still persist, this could be another transmission channel explaining various rates of property taxes. Prussia had the highest amount of cities with access to sewerage. Gdansk (Prussian partition) was the first city with the sewerage already established in 1869. In Warsaw, the sewerage began being constructed in 1881. However, up to 1890 only 4% of all housing had access to sewerage. Since the mid-1850 also gas supply to the households started wide-spreading. In 1913, in Prussian partition one gasworks was covering approx. 40 thousands inhabitants, in the Austrian partition 700 thousands inhabitants and in the Russian partition 1.7 million inhabitants. Water supply was the densest in the cities from the Austrian and Prussian partition, and the least dense in the Russian partition. Also phone network differed strongly among partition. In Prussian partition 9.3 households per one thousand were equipped with the phone, in Russia 3.4 and in the Austrian partition 0.9. Given that the differences in the utility supply at the end of partition and that these differences persisted, one should observe higher property taxes in the municipalities from the former Prussian partition (high utility supply) as compared to the municipalities from the Austrian partition (moderate utility supply) and the Russian partition (low utility supply). This is due to the fact that dense utility supply increases the value of the property and therefore property tax rate, i.e. higher rates are observed in case of more valuable properties.

Summarizing the discussion in that session, it is likely that municipalities with varied empires legacies set differing property tax rates. It is expected that the municipalities with the Prussian 'history' levy higher rates of property taxes as compared to the municipalities with the Russian partition. Given the institutional

differences one could also presume that differences also exist between the Austrian and Russian municipalities. However, the differences, if any, should be much smaller than these between the Prussian and Russian partitions. There are three arguments put forth to explain the potential differences: (1) the differences in the institutional environment of property taxation between the empires which shaped perception and preferences for property taxes; (2) differences in determinants of tax morale such as income, share of self-employed, effectiveness of administration, religiosity and social capital, and (3) differences in utility supply in partitions that influence the value of properties and, therefore, property taxes. The basic assumption is that the differences between the partitions existed but also that they persisted from more than a century.

It is further argued that higher property tax rates influence positively own income of the municipalities, leading to lesser VFI. The higher is VFI, the larger is share of spending covered from external resources such as subsidies from the central government or borrowing in the financial markets.

3. Data and empirical identification

The dataset constructed for the purpose of this paper originates from different sources. Below follows the detailed description of the fiscal, economic and demographic variables as well as geographical data. Since the unit of observation in this study is municipality, all relevant data are collected for this tier of government. Summary statistics are demonstrated in appendix 2.

Property tax rates: The main fiscal variables to be explained in this paper are property tax rates. There are two main types of property taxes, i.e. on land and buildings. In context of the Polish tax system, the latter are clearly defined on residential and business buildings. The tax on land is levied on land used for business purpose and on land used for other purpose. The data on the property tax rates in 2013 are extracted from the municipal resolutions on tax rates, which are available through the Voivodeship Gazette.[7]

Other fiscal variables: Measures of property tax income to total income, fiscal autonomy and VFI are extracted from *Moja Polis* website, which relies on the data from the Ministry of Finance.[8] The longest

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[7]   Voivodship Gazette can be accessed via http://www.dziennikiurzedowe.gov.pl/dzienniki-wojewodztw.html (accessed on December 28, 2014).

[8]   Moja Polis is a watchdog monitoring the municipalities' performance in different areas.

time series available for these indicators encompass the years 2006-2013. For each municipality the average value within this period is calculated.

Economic development: Two measures of economic development of municipalities are offered. The first measure refers to the number of companies[9] per 10,000 inhabitants. For each municipality the average values for the time period of 2006-2013 are calculated based on *Moja Polis* dataset. The second variable to proxy economic development is luminosity in the municipalities. This variable is extracted from Grosfeld and Zhuravskaya (2015). Luminosity is nowadays the most common proxy of economic development in case a measure of GDP per capita is not available or if there are doubts about the precision of GDP per capita estimates (Chen and Nordhaus, 2010). Level of economic activity can also be grasped through unemployment rate. Since unemployment rate measures economic activity and not economic development this is only an alternative indicator.

Education: Census data is used to gauge the education level of the municipal population. Specifically, the percentage of the population with at least secondary education in 2002 was extracted from the Bank of Regional Data (Central Statistical Office). Although Census was also conducted in 2011, the municipal data on education attainment for municipalities are not available.

Social capital: As a proxy of social capital a measure on the number of foundations and associations per 1,000 inhabitants is extracted from *Moja Polis* dataset. For each municipality the average for the period of 2006-2013 is calculated. Additionally, level of social capital is captured by the turnout in the European accession referendum.

Public administration: To approximate the efficiency of public administration, the results of "Friendly municipality" survey conducted by an independent association are employed. Based on public documentation, administration is graded in four areas: (1) cooperation with non-governmental organizations, (2) outsourcing of tasks to non-governmental organizations, (3) consultation of municipality's polices and legal acts with local stakeholders and information availability, (4) municipal support of non-governmental organization. The grades vary from 0 to 5. The results of the 2010 report are taken to proxy efficiency of the public administration at the municipal level.

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[9] Companies are mainly corporations and individuals engaged in business activity. All economic entities need to be registered in REGON system. *Moja Polis* dataset relies exactly on official REGON data.

Geographical data: Based on the map of partition borders prepared by BezGranica Project[10], the shortest distance (straight line) from the central points of municipalities to the closest borders are readily calculated. The data on altitude and geographical coordinates (longitude and latitude) are extracted from http://www.bazamiejscowosci.pl/ and http://www.wysokosc.mapa.info.pl/, respectively.

In order to identify the impact of the empires on property tax rates, spatial RDD methodology is employed. The main logic behind the RD identification strategy is that in case of absence of a causal influence of empires, the spatial pattern of outcomes should be smooth at the previous Prussian-Russian or Austrian-Russian border. If the empires matter then sharp jump in the outcome variables should be detected exactly at the previous partition border. The important assumption is that borders do not correspond to any pre-existing discontinuous differences. This assumption is in essence untestable as there are no historical data to back it up. The historical overview supports however the claim that the borders were set fairly arbitrarily by the partition powers. As historical documents reveal there is no reason to believe that any social or economic outcomes at that time determined the delineation of the border. For instance, during the negotiations process none of the empires ever refer to economic development territory as an argument for the partition. All empires wanted to receive as much of the former Polish land as possible, irrespective of the conditions on the ground. Therefore, the process of establishing borders was political in nature with a bargaining position of Russia strengthened after the Napoleonic wars. There are further two anecdotal proofs of arbitrariness of the partition border. First, in many cases the frontier divided the agrarian areas of landowners. Second, the historical region of Wielkopolska was separated and governed by two empires: Prussia and Russia (Wysokińska, 2011). Moreover, with respect to geographical variables, Grosfeld and Zhuravkaya (2015) demonstrated that geographical indicators change smoothly at the empire borders, besides altitude at the Austria-Russia border. Therefore, in general there is no risk that due to some geographical characteristics (latitude, longitude, precipitation, temperature and large city dummy) some regions could be economically favoured or disadvantaged. However, in order to make the estimates more precise and control for sporadic discontinuous changes in geographical parameters, variables such as altitude, longitude, latitude, large city dummy are used in the baseline regressions.

Even though average differences across empires can be explained by many confounding factors, the estimation of discontinues jump at the former borders reduces the influence of these factors essentially to zero. Consequently, one should consider all variables that exhibit a significant jump at the borders as outcome of the empires' influence.

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[10] The map of the partition borders is available at http://bezgranica.pl/mapy (accessed on December 15, 2014).

Similarly to Dell (2010) as well as Groslfed and Zhuravskaya (2015) two main empirical models are applied, i.e. one-dimensional and two-dimensional spatial RD models. The one-dimensional model employs Euclidean distances to the empires' frontier as the forcing variable. The cross-sectional one-dimensional RD specification is as follows:

$$y_i = \alpha + \beta_1 Russia_i + \beta_2 Dist_i + \beta_3 Russia_i \times Dist_i + \beta_4 X_i + \varepsilon_i \qquad (1)$$

where i stands for municipality, y_i is the outcome variable, such as property tax rate but also other variables such as VFI. $Russia_i$ is a dummy informing that municipality lies at the former Russian territories. $Dist_i$ captures Euclidean distance from each municipality to the partition frontier and allows controlling for continuous relationship between distance and outcome variable y_i. Interaction $Russia_i \times Dist_i$ allows specifying different slopes of the regression functions at the both sides of the partition border. Vector X_i contains baseline control variables such as altitude, longitude, latitude and large city dummy. Standard errors ε_i are robust to unknown hetereskedasticity. The most important is the estimation of β_1 as it tells about the discontinuous jump in the outcome at the partition border.

The two-dimensional RD model allows flexibly controlling for the geographical location instead of employing the one-dimensional distance to the frontier as a forcing variable (Dell, 2010; Grosfeld and Zhuravskaya, 2015). The model is of the following form:

$$y_i = \alpha + \beta_1 Russia_i + f(w_i, z_i) + \beta_4 X_i + \varepsilon_i \qquad (2)$$

where $f(w_i, z_i)$ is a the third-order polynomial of geographic coordinates (latitude, longitude) such as $f(w_i, z_i) = w_i + z_i + w_i^2 + z_i^2 + w_i z_i + w_i^3 + z_i^3 + w_i z_i^2 + w_i^2 z_i$. The rest of the notation is as above.

In order to estimate RD at the borders of empires, one needs to choose also the bandwidth. Restraining the sample to only the municipalities that are located sufficiently close to the border allow linear functions to provide a good fit to the data. On the other hand, the samples should be relatively large to have enough statistical power to estimate the jump. Similarly to Grosfeld and Zhuravskaya (2014) bandwidth of 60 km from the partition frontier is chosen.

4. Results: property tax rates

The central question of this paper is whether the differences in property tax rates in Polish municipalities are caused by the empires' legacy. Existence of the discontinuous jump in tax rates at the Prussia-Russia or

Austria-Russia borders would be a direct proof confirming this hypothesis. A standard procedure in RD is to start investigation by visual inspection of the discontinuity at the threshold, here, at the border.

Figure 2 and figure 3 for Prussia-Russia and Austria-Russia borders respectively allows for this graphical representation of discontinuity. The graphs present average level of property tax rates by distance bin of 5- and 3-km on both sides of the border with superimposed polynomial functions of degree-1 (linear function), degree-2 (quadratic function) and degree-3.

As for the Prussia-Russia border (figure 2), it is evident that property tax rates on residential and business buildings as well as on land used for business purpose are higher in the former Prussian municipalities as compared to their Russian counterfactuals. The rates of these three types of property taxes discontinuously change at the former partition border between Prussia and Russia, which is not the case for the tax on land used for 'other purpose'. In case of these three categories of taxes, for which sharp jump is identified, municipalities have more leeway to act arbitrarily as tax rates ceilings in their case are higher as compared to the tax on land used for 'other purpose'. Figure 2 also demonstrates that the relationship between the outcomes and the distance to the former empires' border is relatively well approximated by the linear relationship within 60 km to the borders.

Besides the tax levied on land used for 'other purpose', less clear-cut results are observed at the Austria-Russia border (figure 3). Although graphs with 5-km bins suggest that the municipalities from the former Russian partition levy higher tax rates than Austrian counterparts, the figures with 3-km bins are ambiguous. This calls for more formal investigation, which is done in the next step. It is of note that linear function has worse fit as compared to the Prussia-Russia border. Using high level polynomials in RD is. However, discouraged (Gelman and Imbens, 2014). This further complicates deriving any conclusions for the Austria-Russia border.

Figure 2. Mean property tax rates by 5- and 3- km distance and parametric regression lines at the Prussia-Russia border
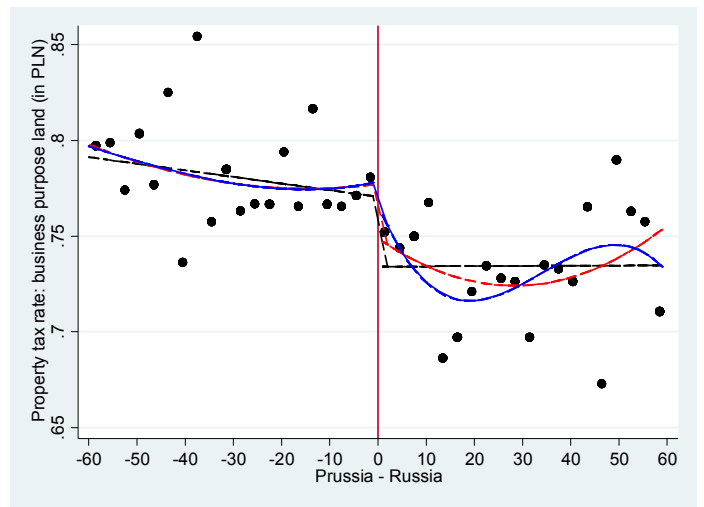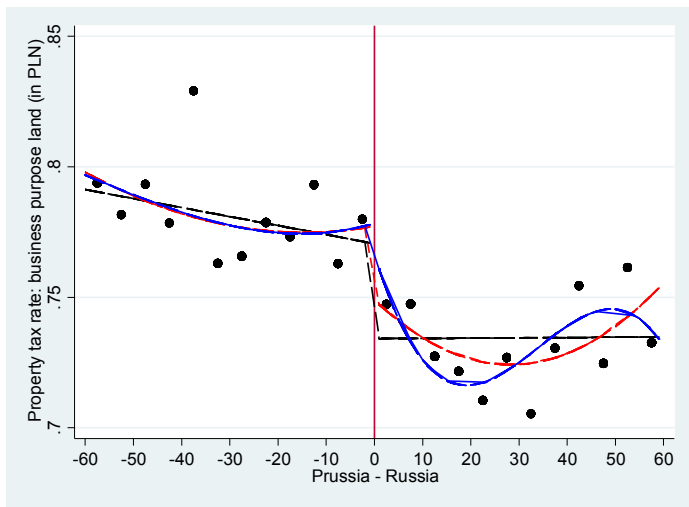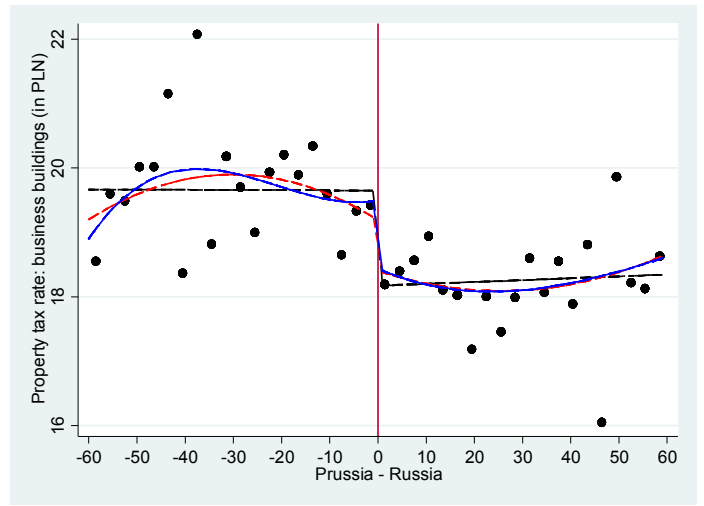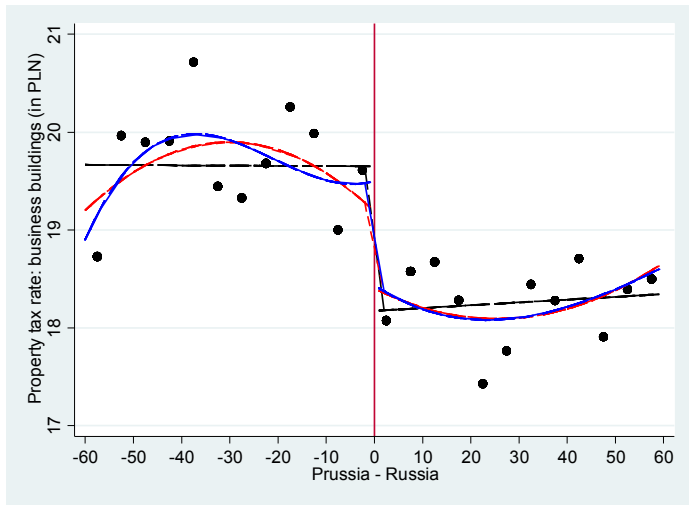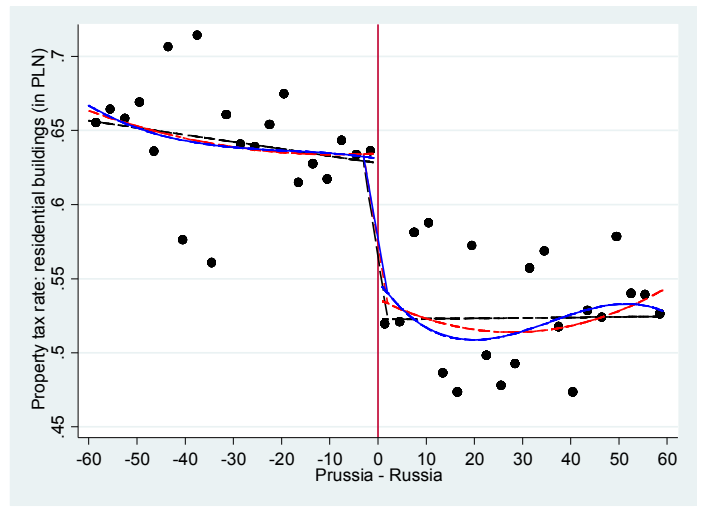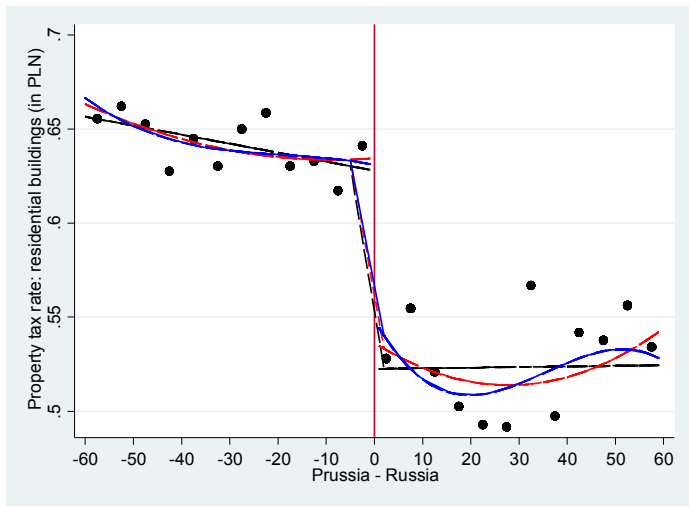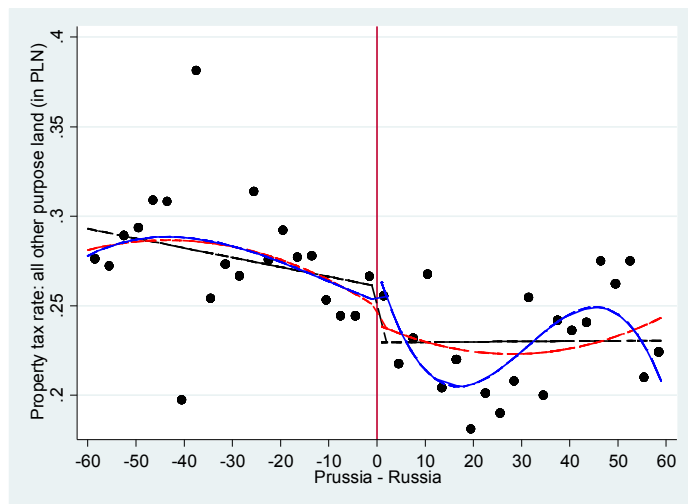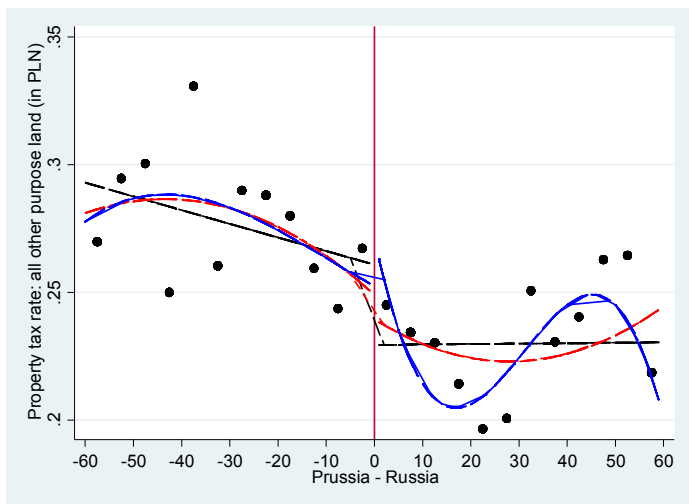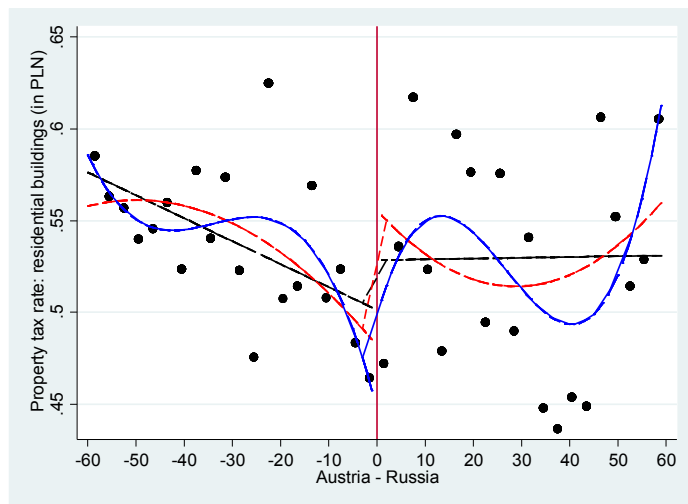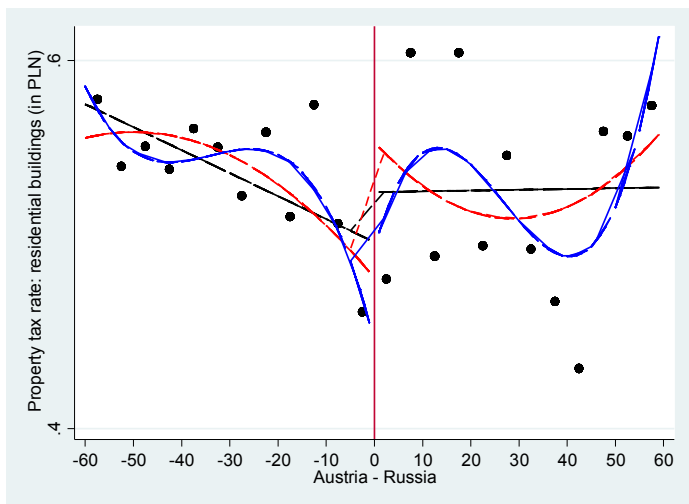
Figure 3. Mean property tax rates by 5- and 3- km distance and parametric regression lines at the Austria-Russia border

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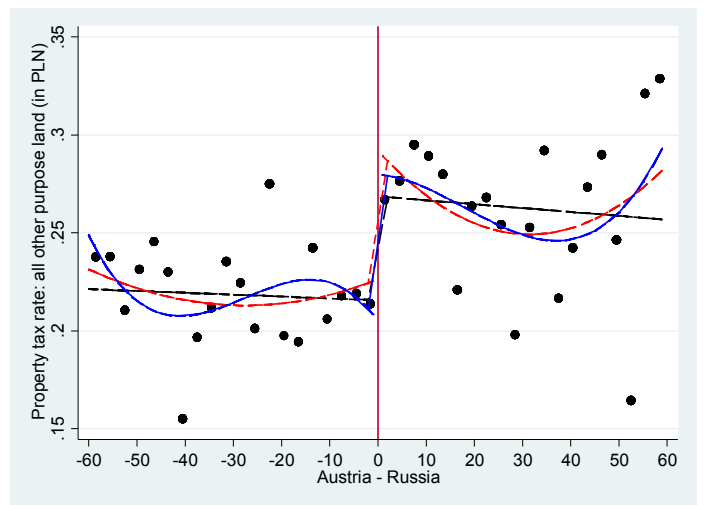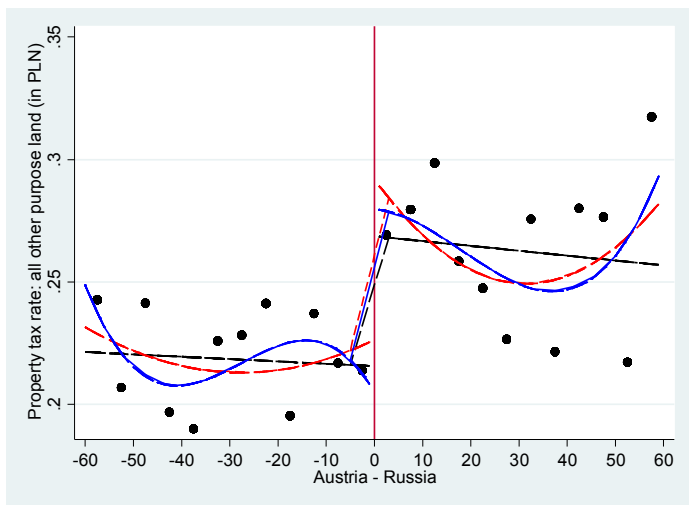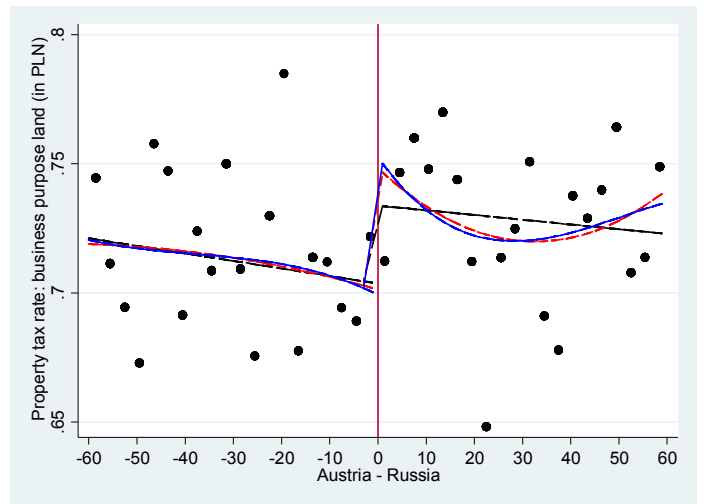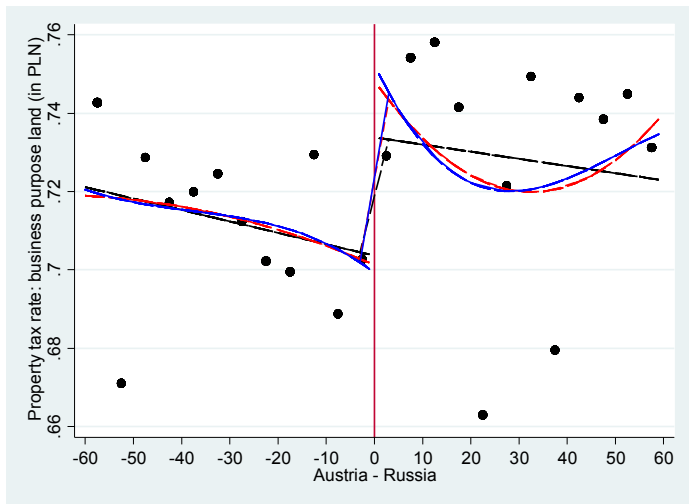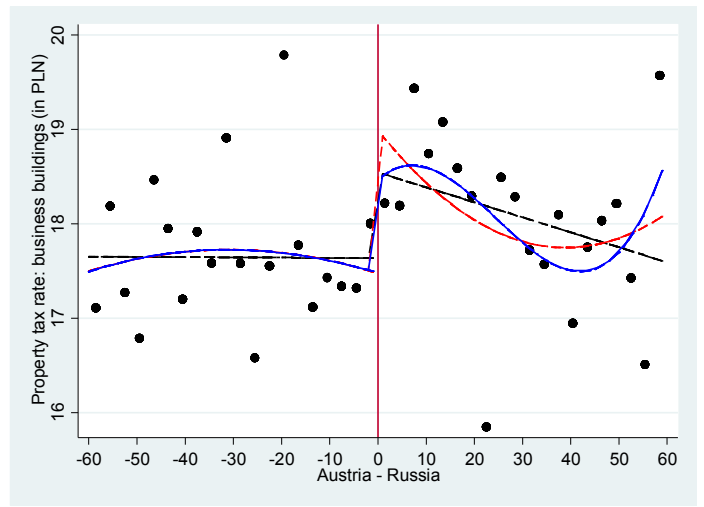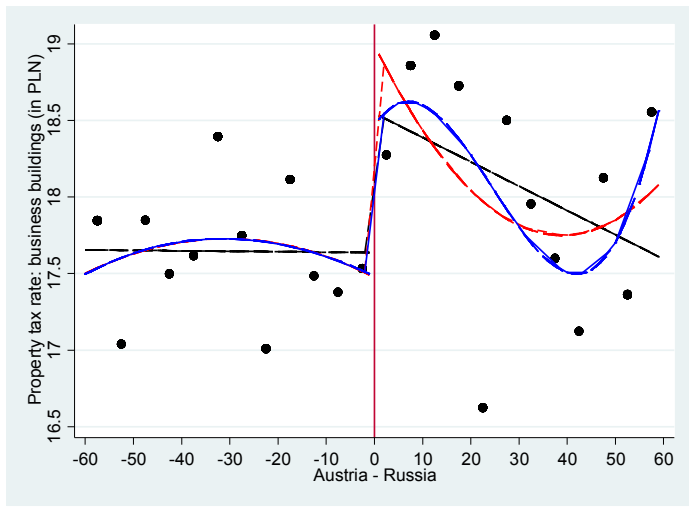
More formal investigation is presented in table 2 and table 3, which report the estimates of discontinuous jump in property tax rates at the Prussia-Russia border and Austria-Russia borders, respectively. In both tables panel A demonstrates estimates for the tax rates on residential buildings, panel B on business buildings, panel C on land used for a business purpose and panel D on land for 'other purpose'. Columns 1 and 2 display results for one-dimensional RD (Grosfeld and Zhuravskaya, 2015) and columns 3 and 4 two-dimensional RD (Dell, 2010; Grosfeld and Zhuravskaya, 2015).

Results in table 2 and table 3 confirm the graphical illustration from figure 2 and 3. Namely, at the Prussia-Russia border, Russian legacy leads to lower rates in case of tax levied on residential and business buildings as well as land used for business purpose. With one exception (column 2 in panel D), all estimates are significant at 1% level. Average treatment effect of Russian partition on tax rates levied on residential buildings ranges between 0.09 and 0.11 PLN, which accounts for 17-20% of the average tax rate for this tax. Rates of tax imposed on business buildings are lower on average by 1.22-1.48 PLN on the Russian side, which is roughly 6-8% of the average rate for this tax. The average treatment effect for tax levied on land used for business purpose varies from 0.03 to 0.04, which is approx. 4-5% of this tax average. Therefore, the estimates are not only highly statistically significant but also meaningful from the economic point of view. The tax rate levied on land used for 'other purpose' does not change discontinuously at the Prussia-Russia border, although the direction of estimates is negative and significant in one case.

Regression analysis also confirms a lack of discontinuity at the Austria-Russia border for tax levied on residential and business buildings as well as business land. Statistically significant is however average treatment effect for the tax imposed on land used for 'other purpose'. Russian partition affects this tax rate positively by 0.05-0.06 PLN, which is 16-20% of the average rate of this tax. This tax has however the lowest ceiling set by the Ministry of Finance of only 0.45 PLN.

Table 2. The effect of partitions on property tax rates at the Prussia-Russia border

	PANEL A			
VARIABLES	(1) Property tax Residential buildings	(2) Property tax Residential buildings	(3) Property tax Residential buildings	(4) Property tax Residential buildings
Russia	-0.10548*** (0.01977)	-0.09586*** (0.01842)	-0.11119*** (0.01825)	-0.11426*** (0.01841)

Constant	0.62798***	0.97556*	-1,361.01670	340.58662
	(0.01043)	(0.52541)	(989.10480)	(464.54847)
Observations	529	529	529	529
R-squared	0.17405	0.25024	0.26086	0.25965

PANEL B

VARIABLES	(1) Property tax Business buildings	(2) Property tax Business buildings	(3) Property tax Business buildings	(4) Property tax Business buildings
Russia	-1.47862***	-1.26063***	-1.26872***	-1.22423***
	(0.37839)	(0.34777)	(0.33108)	(0.31614)
Constant	19.65163***	39.22353***	29,087.10534	18,391.00933**
	(0.29480)	(10.74162)	(19,462.02816)	(9,348.53863)
Observations	530	530	530	530
R-squared	0.07972	0.18180	0.18181	0.21523

PANEL C

VARIABLES	(1) Property tax Business land	(2) Property tax Business land	(3) Property tax Business land	(4) Property tax Business land
Russia	-0.03646***	-0.03084**	-0.03563***	-0.03715***
	(0.01358)	(0.01291)	(0.01205)	(0.01172)
Constant	0.77061***	1.92253***	761.62819	45.03081
	(0.00951)	(0.38172)	(742.02907)	(365.57352)
Observations	530	530	530	530
R-squared	0.05911	0.12557	0.14705	0.16410

PANEL D

VARIABLES	(1) Property tax Other purpose land	(2) Property tax Other purpose land	(3) Property tax Other purpose land	(4) Property tax Other purpose land
Russia	-0.03138**	-0.02263	-0.01632	-0.01169
	(0.01564)	(0.01448)	(0.01315)	(0.01287)
Constant	0.26089***	0.88833**	1,079.39919	556.98763
	(0.01191)	(0.44302)	(725.37996)	(371.13739)
Observations	530	530	530	530
R-squared	0.05683	0.15565	0.14805	0.18133

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3. The effect of partitions on property tax rates at the Austria-Russia border

PANEL A

VARIABLES	(1) Property tax Residential buildings	(2) Property tax Residential buildings	(3) Property tax Residential buildings	(4) Property tax Residential buildings
Russia	0.02715	0.01031	0.01754	0.01084
	(0.02756)	(0.02843)	(0.02491)	(0.02631)
Constant	0.50134***	3.89154	-269.17332	-954.89216
	(0.01906)	(2.46916)	(554.11132)	(1,158.30547)
Observations	483	479	479	479
R-squared	0.01170	0.05146	0.13908	0.14116

PANEL B

VARIABLES	(1) Property tax Business buildings	(2) Property tax Business buildings	(3) Property tax Business buildings	(4) Property tax Business buildings
g1	0.90884	1.31650**	0.43907	0.85389
	(0.55949)	(0.59307)	(0.48759)	(0.52579)
Constant	17.63802***	86.51159*	-29087.67621***	-44686.15959**
	(0.42049)	(50.55532)	(10,846.67895)	(20,606.54820)
Observations	484	480	480	480
R-squared	0.01008	0.07409	0.16467	0.18727

PANEL C

VARIABLES	(1) Property tax Business land	(2) Property tax Business land	(3) Property tax Business land	(4) Property tax Business land
Russia	0.03022	0.04167**	0.02774	0.03429*
	(0.01992)	(0.02062)	(0.01782)	(0.01843)
Constant	0.70364***	4.91807***	-722.40033*	-1,238.15263
	(0.01562)	(1.85490)	(413.41059)	(821.06482)
Observations	482	478	478	478
R-squared	0.00639	0.06005	0.10669	0.11438

PANEL D

VARIABLES	(1) Property tax Other purpose land	(2) Property tax Other purpose land	(3) Property tax Other purpose land	(4) Property tax Other purpose land
Russia	0.05307***	0.04897***	0.05763***	0.05625***
	(0.01762)	(0.01883)	(0.01712)	(0.01844)

Constant	0.21556***	2.25858	-885.03467**	-1,929.02951**
	(0.01100)	(1.75870)	(415.97843)	(870.88617)
Observations	482	478	478	478
R-squared	0.04696	0.07153	0.11091	0.11827

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The fact that Russian partition affects the property tax rates negatively only at the Prussia-Russia border suggest that the first transmission channel might be the most valid in explaining the differences in property tax rates. Namely, initial differences in property taxes and infrastructure enabling to levy them, such as cadastre, could shape people's perception regarding the property tax and their willingness to pay this tax. Tax morale argument (due to religiosity, social capital, effectiveness of administration) and utility supply argument might be less relevant. It is because at the Austrian-Russia border similar differences occur as at the Prussia-Russia border in terms of tax morale determinants and utility supply but the tax rates do not differ or even Russian partition has a positive effect on rates (see appendix 3).[11] Overall the differences in property tax rates at Austria-Russia border are much less conclusive. Importantly, however, at the Prussia-Russia border empire legacy seems to be crucial in explaining the differences.

5. Results: other fiscal outcomes

Higher property tax rates might have further budget implications. First, higher property tax rates might result in larger share of income coming from property taxes. Second, higher property tax rates might lead to larger share of own revenue in the total municipal revenue, causing larger fiscal autonomy of municipalities. This concept of fiscal autonomy is suggested by Stegarescu (2005) and OECD/Korea Institute of Public Finance (2013). Own revenues are primarily generated by taxes and levies imposed on local residents and businesses but they can also come from the municipality's investment and loans. The share of the own revenue in total municipal income indicates the municipality's independence from the central subsidies. Municipalities with higher shares of own revenue have more fiscal autonomy as they can arbitrarily decide how this revenue is spent. Subsidies are usually associated with stringencies which prevent discretionary decision-making (Heller and Farelnik, 2013).

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[11] Explain the differences and similaritlies.

Third, higher property tax rates by increasing own revenue might result in smaller vertical fiscal imbalance, i.e. share of spending covered from subsidies and borrowings. It is widely recognized in the literature on fiscal federalism that a high reliance on intergovernmental transfers and borrowings "softens" the budget constraint of state level governments, induces moral hazard on the side of states and distorts their tax enforcement (Baretti et al. 2002). According to Rodden (2003), 'transfer-dependent municipalities face weak incentives to be fiscally responsible, since it is more rewarding to position themselves for a bailout'. Municipalities endowed with high transfers from the federal level typically do not have sufficient tax authority to cope with idiosyncratic economic shocks (von Hagen and Eichengreen, 1996). Since resources anyway come mainly from central transfers, municipalities may claim that they are not responsible for coping with the crisis and, thus, shift the burden to the central level. Furthermore, the pressure from voters and creditors is likely directed at the central level, which has no choice but to bail out the municipalities. Expecting this chain of actions, municipalities have an incentive to engage in riskier fiscal policies (moral hazard). Thus, intergovernmental transfers may lead to excessive and unproductive spending, and inefficient revenue mobilization.

Main differences in the property tax rates are observed at the Prussia-Russia border, hence, discontinuity in aforementioned fiscal variables is expected to occur at this border. The Austria-Russia border serves as a counterfactual as differences in tax rates at this border are much less appealing. Therefore, the analysis here is as follows. First, it visually investigates whether the discontinuity in fiscal outcomes exist at the Prussian-Russian frontier. Second, it verifies whether fiscal outcomes changes smoothly at the Austria-Russia border, i.e. the border at which fiscal variables should not be affected.

Figure 4 portrays graphically the existence of discontinues jump in several fiscal variables at the Prussia-Russia border. Lack thereof at the Austria-Russia border is shown in figure 5. Crossing the former partition border between Prussia and Russia from the West to East (figure 4) decreases property tax income as a share of total income and, hence, fiscal autonomy, and consequently, increases VFI. Figure 5 shows on the other hand, smooth distribution of fiscal outcomes at the Austria-Russia border. Yet again the graphs suggest that the outcomes at the Prussia-Russia border are fairly well approximated by the linear relationship within 60 km to the borders.

Figure 4. Mean property tax rates by 3- km distance and parametric regression lines: Prussia-Russia border
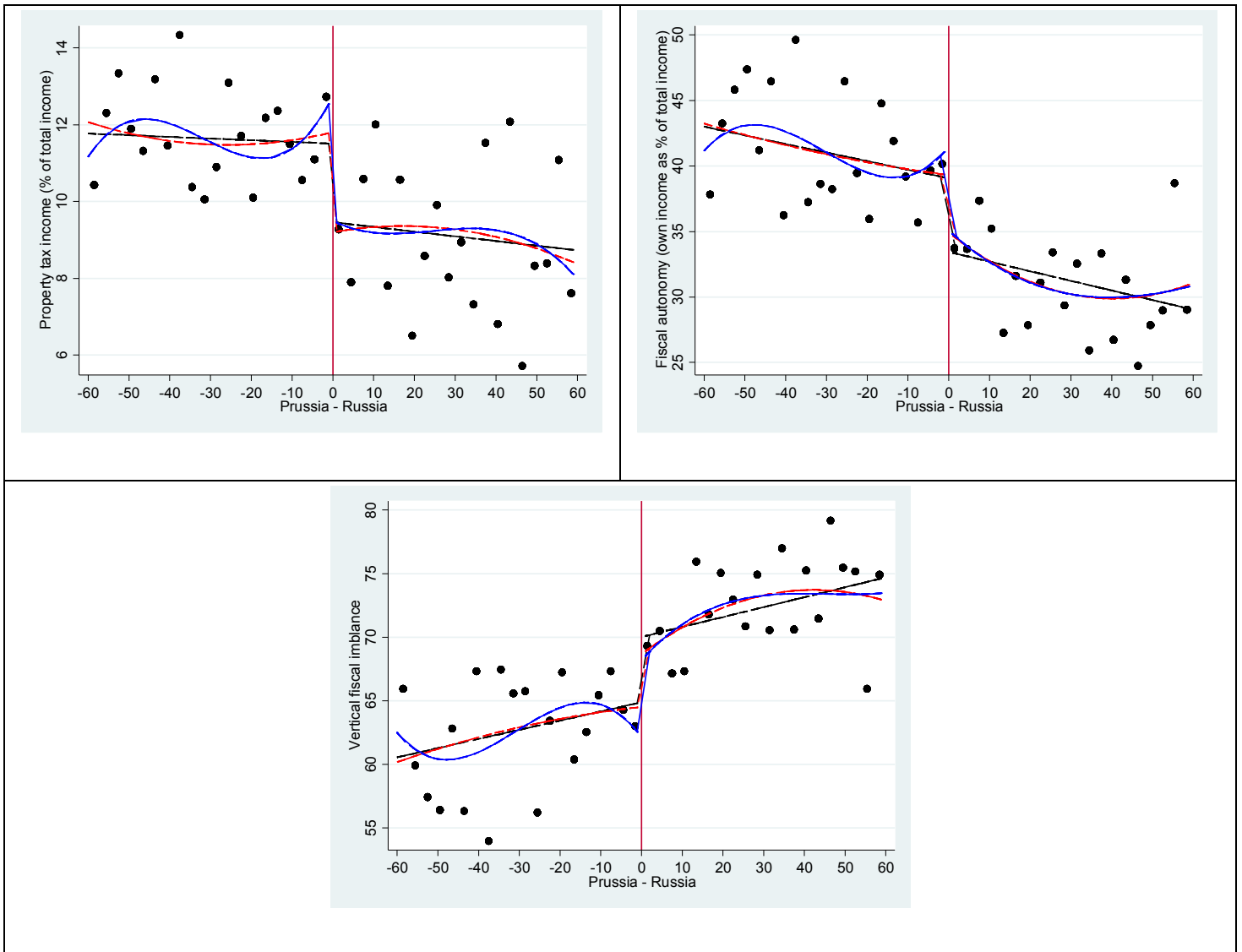
Figure 5. Mean property tax rates by 3- km distance and parametric regression lines: Austria-Russia border
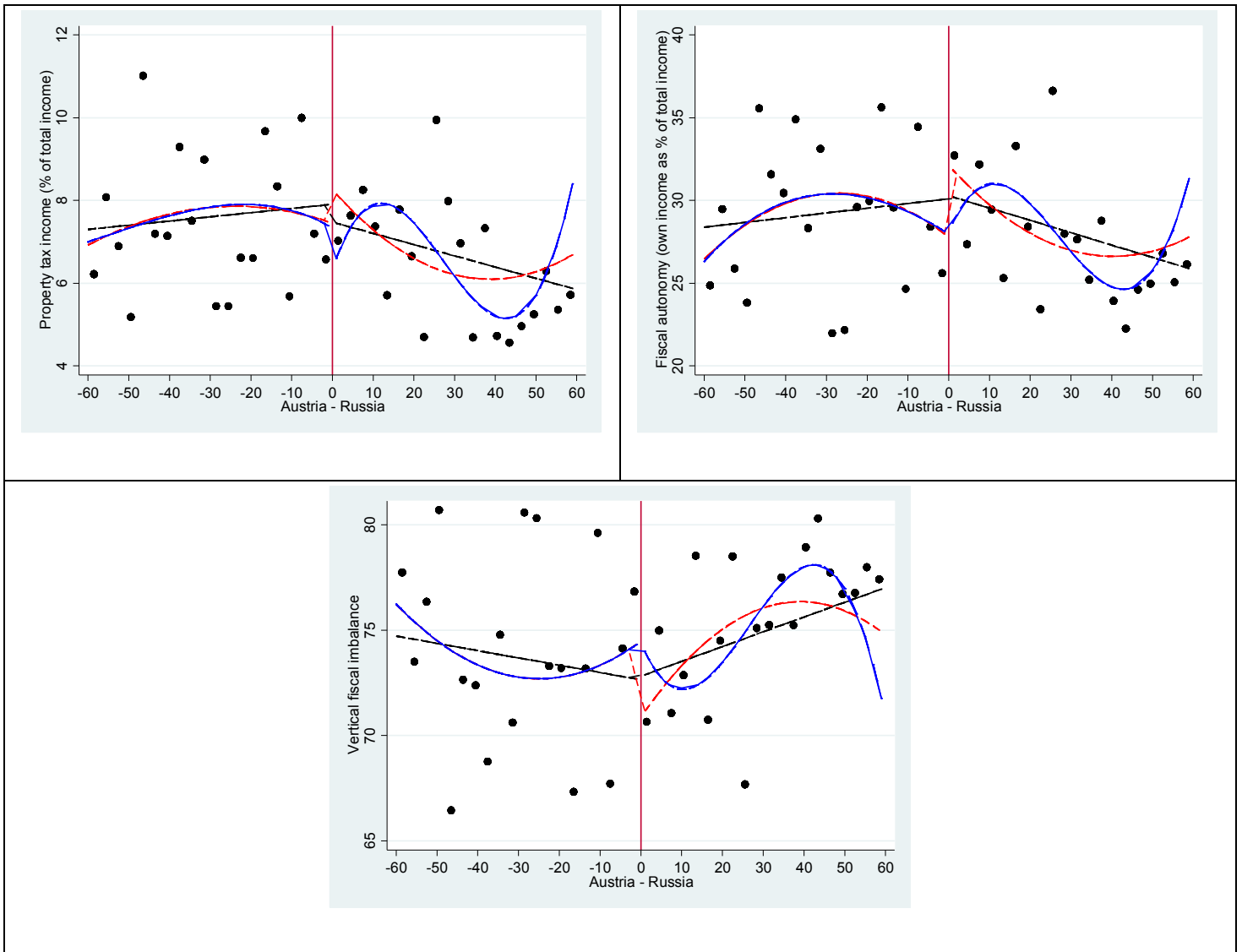
Formal – regression – analysis is consistent with the graphical illustration of discontinuity at the Prussia-Russia border and lack thereof at the Austria-Russia border. In the municipalities with the Russian legacy a share of property tax income in total income is smaller by 2-3 percentage points as compared to municipalities from former Prussian occupation (table 4 panel A). Lower property tax income in the Russian municipalities contributes to a smaller fiscal autonomy in these municipalities as compared to the municipalities from the former Prussian empire. As reported in table 4 panel B, in the former Russian municipalities the fiscal autonomy – share of own revenue in total revenue – is smaller by approx. 5 percentage points. Lastly, due to a smaller own revenue in the Russian Poland, VFI is consequently larger there. Estimates reported in table 4 panel C suggest that in municipalities located in 'Russian' Poland share

of spending covered by own revenue is lesser by approx. 4-5 percentage points as compared to municipalities from Prussian Poland.

Table 4. The effect of partitions on various fiscal variables at the Prussia-Russia border

PANEL A

VARIABLES	(1) Property tax income as a share of total income	(2) Property tax income as a share of total income	(3) Property tax income as a share of total income	(4) Property tax income as a share of total income
Russia	-2.04906**	-1.90882**	-2.64351***	-2.34247***
	(0.92520)	(0.89789)	(0.83143)	(0.84620)
Constant	11.51083***	91.86725***	105378.80585**	-44496.15840**
	(0.64441)	(24.36807)	(40,789.64042)	(21,159.30598)
Observations	532	532	532	532
R-squared	0.04251	0.08512	0.14524	0.13242

PANEL B

VARIABLES	(1) Fiscal autonomy	(2) Fiscal autonomy	(3) Fiscal autonomy	(4) Fiscal autonomy
Russia	-5.62221**	-4.44728**	-5.50328***	-4.64197***
	(2.19989)	(1.92405)	(1.74979)	(1.76809)
Constant	39.06428***	314.20242***	270399.12841***	-1.13532e+05**
	(1.68568)	(55.06126)	(82,686.58187)	(45,533.25234)
Observations	532	532	532	532
R-squared	0.12120	0.29731	0.39212	0.38480

PANEL C

VARIABLES	(1) Vertical fiscal imbalance	(2) Vertical fiscal imbalance	(3) Vertical fiscal imbalance	(4) Vertical fiscal imbalance
Russia	5.14404**	3.98518**	5.43076***	4.57742***
	(2.22416)	(1.93303)	(1.72923)	(1.75296)
Constant	64.88170***	-218.19090***	-2.87924e+05***	98,514.75187**
	(1.70892)	(56.93351)	(84,316.21204)	(48,610.70702)
Observations	532	532	532	532
R-squared	0.11823	0.30284	0.40323	0.39554

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In contrast to the Prussia-Russia border, where discontinuous jumps in outcome variables are observed, the fiscal variables changes smoothly at the Austria-Russia border (see table 5). As there are no differences in the tax rates between Austrian and Russian partitions, the property tax income are fairly similar on both side of the partition border. This further implies that fiscal autonomy and VFI are comparable close to the partition border. This result further substantiates the outcomes for the Prussia-Russia border, where differences in property tax rates had implications for other fiscal variables such as fiscal autonomy and vertical fiscal imbalance.

Table 5. The effect of partitions on various fiscal variables at the Austria-Russia border

	PANEL A			
	(1)	(2)	(3)	(4)
VARIABLES	Property tax income as a share of total income	Property tax income as a share of total income	Property tax income as a share of total income	Property tax income as a share of total income
Russia	-0.43099	-0.29787	-1.85137**	-1.37860
	(1.00291)	(1.03342)	(0.79767)	(0.90932)
Constant	7.90739***	-60.68855	-41451.37267**	-63559.57631
	(0.62593)	(82.59759)	(19,886.19578)	(44,551.40838)
Observations	498	494	494	494
R-squared	0.01216	0.11308	0.20924	0.21994

	PANEL B			
	(1)	(2)	(3)	(4)
VARIABLES	Fiscal autonomy	Fiscal autonomy	Fiscal autonomy	Fiscal autonomy
g1	0.18284	0.53790	-4.11360**	-2.36152
	(2.40519)	(2.22787)	(1.71723)	(1.83317)
Constant	30.10418***	-67.10910	-2.25443e+05***	-3.77607e+05***
	(1.65455)	(177.94949)	(41,440.63287)	(87,183.51180)
Observations	498	494	494	494
R-squared	0.00791	0.21591	0.36265	0.38620

	PANEL C			
	(1)	(2)	(3)	(4)
VARIABLES	Vertical fiscal imbalance	Vertical fiscal imbalance	Vertical fiscal imbalance	Vertical fiscal imbalance
Russia	0.16945	-0.16182	4.23405**	2.50495
	(2.40309)	(2.25000)	(1.73495)	(1.84948)
Constant	72.64790***	134.56889	208363.59180***	342108.71476***
	(1.66604)	(176.08389)	(40,868.03048)	(87,973.08463)

Observations	498	494	494	494
R-squared	0.00782	0.21309	0.35840	0.38131

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

7. Conclusions and outlook

Overall, this paper adds to the discussion on the path-dependence and historical persistence of institutions, perceptions and preferences. It is shown that empires' legacy in today's Poland are still observed. The novelty of this paper is to demonstrate that history matters for fiscal outcomes, namely for the property tax rates imposed by the municipalities. The historical narrative suggests that Prussian partition had the most 'effective' property tax system among the empires. Prussia was unique for its cadastre which also included the building coordinates, and served to set the tax according to the real value of the property. Cadastre therefore did not only ensure the property right as lands and buildings as properties were officially registered in the repository but also make the property tax fairer as it depended on the value of the property. Importantly, in the Prussian part of Poland the property tax was a competence of lower tier of government and income levied through this tax was used for a local purpose. In the Austrian and, particularly, Russian partition cadastre was used to lesser extent and property taxes were centrally imposed. All these institutional details serve as reference points and shape perception and preferences over the property tax differently in three empires. Namely, they increase the willingness to pay property taxes to a larger extent in 'Prussian' Poland than in the Austrian and Russian partitions. This willingness to pay higher property tax seem to persist as in the former Prussian municipalities the rates of the most common property taxes are higher as compared to Russian counterparts. At the Austria-Russia border where the differences in property tax institutions were lesser differences in rates are not observed at all.

The findings from this study may have important policy implications. When thinking about transplanting tax system – or other policies – it is important to bear in mind that outcomes of transplanting might vary depending on the rules applied before. Against this backdrop, some tentative conjecture might be derived for the European Union institutions. There are many areas of the law in which the European Union seeks to harmonize national legal frameworks. It seems likely that the path-dependence might impede harmonization in a sense that rules applicable before the harmonization continue to co-determine outcomes for quite some time. To some extent, EU is aware of these path-dependencies and imprints.

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Appendix 1.

Figure 6. Borders of contemporary Poland, borders of the Second Polish Republic in 1918-1939 and partition frontiers in 1815-1918
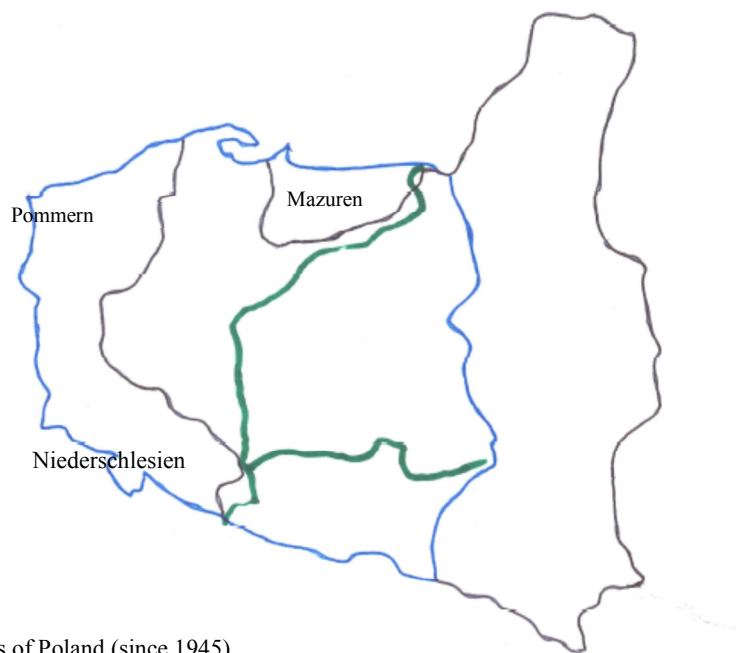
Blue: contemporary borders of Poland (since 1945)

Black: borders of the Second Republic (1918-1939)

Green: partition borders (1815-1918)

Source: own map based on several web sources.

Appendix 2.

Table 6. Summary statistics

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Property tax: residential buildings	1094	0.55787	.139774	.02	.73
Property tax: business buildings	1094	18.3766	2.492789	9	22.82
Property tax: land used for business purpose	1094	0.73753	.0968916	.37	.88

Property tax: land used for other purpose	1094	0.24658	.1026558	.02	.45
Share of property tax income in total income	2478	9.596184	5.933893	1.146481	51.22268
Fiscal autonomy	2478	.3396254	.138855	.0878153	1.271392
Vertical fiscal imbalance	2478	69.5917	14.86809	2.612559	94.5357
Number of companies per 10,000 inhabitants	2478	736.5408	317.6458	280.778	3675.487
Luminosity	2465	6.562086	10.83182	0	61.1271
Unemployment rate	2478	9.438696	3.781679	2.006725	26.80711
Share of population with at least secondary education	2478	21.90544	6.059679	7.6071	42.6
Effectiveness of administration	2193	2.248974	1.066972	0	5
Number of foundations and associations per 10,000 inhabitants	2473	15.67147	8.242992	0	81.12563
Voter turnout in the EU accession referendum	2478	52.83171	7.272536	27.7397	5.5776
Number of mess attendances (monthly)	646	2.740867	.9526309	.5	6.6
Share of houses connected to gas supply	2469	24.41798	31.07147	0	99.5307
Share of houses connected to water supply	2475	90.37644	8.795973	38.3085	100
Share of houses connected to sewerage	2289	39.44828	26.09172	0	99.4393

Appendix 3.

Table 7 reports estimates for the determinants of tax morale at the Prussia-Russia border, such as income, education, effectiveness of administration, social capital and religiosity. Panel A, B and C suggest that there is no differences in economic development or economic activity between municipalities from the former Prussian and Russian partitions. Number of companies per 10,000 inhabitants, luminosity and unemployment rate change smoothly at the partition border. This largely confirms the hypothesis that Poland managed to mitigate the economic differences between former Prussian and Russian empires. Also

share of population with at least secondary education does not change abruptly at the Prussia-Russia border (panel D). This come neither as a surprise as during the socialism in Poland much effort was put in levelling the education attainment of population. In panel E the estimates of an indicator depicting how 'effective' (friendly) is public administration at the municipal level. Given that estimates reach significant level, it seems plausible to conclude that the efficiency (friendliness) of administration persists as on the Russian side of the border the efficiency of administration is significantly lower. Social capital is proxied by two variables number of foundations and associations per 10,000 inhabitants as well as voter turnout in the EU accession referendum in 2003. In case of both variables estimates are significant suggesting that social capital is lower on the Russian side of the frontier (panel F and G). Lastly, religiosity too changes discontinuously at the partition border, with significantly lower mess attendance in the municipalities from the former Russian part. Table 8, in turn, reports estimates for the same variables but at the Austria-Russia border. Besides estimation for the unemployment rate suggesting that economic activity is higher on the Russian side, all other variables display the same pattern as at the Prussia-Russia border. Given that at the Prussia-Russia frontier change in property tax rate is identified and not at the Austria-Russia border, tax morale transmission channel seems to be unable to explain this change. It is because similar determinates of tax morale are present at the Austria-Russia border but switch in property tax rates is lacking.

Table 7. The effect of partitions on tax morale determinants at the Prussia-Russia border

		PANEL A		
	(1)	(2)	(3)	(4)
VARIABLES	Number of companies per 10,000 inhabitants	Number of companies per 10,000 inhabitants	Number of companies per 10,000 inhabitants	Number of companies per 10,000 inhabitants
Russia	3.54749	18.41168	6.81848	11.94208
	(36.26164)	(32.14501)	(29.93923)	(28.47786)
Constant	744.11245***	1,061.54855	-3.10361e+06**	-2.20575e+06***
	(27.89534)	(977.42785)	(1.53450e+06)	(823973.08920)
Observations	532	532	532	532
R-squared	0.10292	0.24853	0.29933	0.35060

		PANEL B		
	(1)	(2)	(3)	(4)
VARIABLES	Luminosity	Luminosity	Luminosity	Luminosity
Russia	-4.06060	-1.75244	-2.07511	-0.56824
	(2.57237)	(1.79190)	(1.80030)	(1.56318)
Constant	12.04408***	296.10410***	264891.87534***	-1.60374e+05***
	(2.20609)	(43.80417)	(83,555.45094)	(43,353.20203)

	Observations	530	530	530	530
	R-squared	0.05378	0.48420	0.39878	0.55607

PANEL C

VARIABLES	(1) Unemployment rate	(2) Unemployment rate	(3) Unemployment rate	(4) Unemployment rate
Russia	0.78090	0.55243	0.31280	0.50069
	(0.54222)	(0.38223)	(0.33920)	(0.34571)
Constant	8.69173***	-122.45192***	74,676.37897***	9,051.44203
	(0.42441)	(11.57044)	(17,716.62652)	(9,175.61728)
Observations	532	532	532	532
R-squared	0.11752	0.51653	0.58966	0.57954

PANEL D

VARIABLES	(1) Share of population with at least secondary education	(2) Share of population with at least secondary education	(3) Share of population with at least secondary education	(4) Share of population with at least secondary education
Russia	-1.14163	-0.38822	-1.05297	-0.83202
	(0.97455)	(0.80396)	(0.81727)	(0.77532)
Constant	23.52138***	74.95557***	-83951.09761*	-68193.69427***
	(0.71536)	(23.06155)	(48,777.82486)	(24,806.89966)
Observations	532	532	532	532
R-squared	0.04652	0.29383	0.23889	0.32059

PANEL E

VARIABLES	(1) Administration effectiveness	(2) Administration effectiveness	(3) Administration effectiveness	(4) Administration effectiveness
Russia	-0.64748***	-0.54886***	-0.44837***	-0.35440**
	(0.18293)	(0.16311)	(0.16858)	(0.16119)
Constant	2.59173***	3.30341	2,509.83904	-1,921.20714
	(0.14305)	(4.97707)	(9,784.01514)	(4,572.66327)
Observations	475	475	475	475
R-squared	0.10170	0.26513	0.18786	0.26658

PANEL F

VARIABLES	(1) Number of foundations per 10,000 individuals	(2) Number of foundations per 10,000 individuals	(3) Number of foundations per 10,000 individuals	(4) Number of foundations per 10,000 individuals
Russia	-2.99091***	-2.92719***	-2.50689**	-2.34452**
	(1.08671)	(1.01663)	(1.01332)	(0.97087)
Constant	16.09043***	7.56686	-73792.37095	-37124.33714

	(0.79107)	(27.00661)	(49,527.83267)	(24,887.42945)
Observations	531	531	531	531
R-squared	0.09266	0.19126	0.14535	0.19881

PANEL G

VARIABLES	(1) Referendum turnout	(2) Referendum turnout	(3) Referendum turnout	(4) Referendum turnout
Russia	-4.13523***	-3.62758***	-4.20713***	-4.09926***
	(0.98126)	(0.82842)	(0.82627)	(0.81480)
Constant	56.50591***	172.26337***	-1.15752e+05**	-1.10298e+05***
	(0.72021)	(27.19133)	(48,909.35175)	(26,231.56371)
Observations	532	532	532	532
R-squared	0.31283	0.47759	0.48729	0.50890

PANEL H

VARIABLES	(1) Religiosity	(2) Religiosity	(3) Religiosity	(4) Religiosity
g	-0.59627***	-0.58204***	-0.38331***	-0.43033***
	(0.15612)	(0.13752)	(0.11819)	(0.11282)
Constant	3.16464***	27.70245***	-18801.47425***	-5,938.66235*
	(0.12094)	(3.45251)	(6,251.72063)	(3,137.65108)
Observations	529	529	529	529
R-squared	0.11313	0.34117	0.38578	0.40248

Table 8. The effect of partitions on tax morale determinants at the Austria-Russia border

PANEL A

VARIABLES	(1) Number of companies per 10,000 inhabitants	(2) Number of companies per 10,000 inhabitants	(3) Number of companies per 10,000 inhabitants	(4) Number of companies per 10,000 inhabitants
Russia	40.97176	-7.64538	-9.42003	-8.14768
	(45.82902)	(40.34609)	(35.01888)	(36.39205)
Constant	632.48700***	-2,205.02128	-26637.27897	166656.10935
	(34.09851)	(3,397.38185)	(843355.94486)	(1.71142e+06)
Observations	498	494	494	494
R-squared	0.02168	0.30882	0.32672	0.36418

PANEL B

	(1)	(2)	(3)	(4)

VARIABLES	Luminosity	Luminosity	Luminosity	Luminosity
Russia	-0.04406	0.31674	-2.92001**	-1.43392
	(1.96725)	(1.70052)	(1.40682)	(1.44358)
Constant	8.84920***	-30.82913	-2.05472e+05***	-3.07383e+05***
	(1.33111)	(123.55303)	(41,830.37696)	(79,752.94559)
Observations	492	492	492	492
R-squared	0.04856	0.31602	0.25473	0.39477

PANEL C

	(1)	(2)	(3)	(4)
	Unemployment rate	Unemployment rate	Unemployment rate	Unemployment rate
VARIABLES				
Russia	-0.64316	-0.98969**	-1.23727***	-1.91384***
	(0.54346)	(0.45931)	(0.40851)	(0.42041)
Constant	9.06453***	-196.98792***	40,066.33422***	54,610.35694*
	(0.41379)	(37.08802)	(14,527.91362)	(29,607.82452)
Observations	498	494	494	494
R-squared	0.03039	0.33590	0.42654	0.45307

PANEL D

	(1)	(2)	(3)	(4)
	Share of population with at least secondary education	Share of population with at least secondary education	Share of population with at least secondary education	Share of population with at least secondary education
VARIABLES				
Russia	0.94745	1.13979	-0.65661	-0.06658
	(1.06272)	(1.05415)	(0.90888)	(0.97096)
Constant	22.43078***	-53.83633	-87174.59766***	-1.33848e+05***
	(0.72830)	(87.81820)	(21,602.01287)	(46,572.66475)
Observations	498	494	494	494
R-squared	0.02301	0.13058	0.14095	0.19425

PANEL E

	(1)	(2)	(3)	(4)
	Administration effectiveness	Administration effectiveness	Administration effectiveness	Administration effectiveness
VARIABLES				
Russia	-0.34237*	-0.37648**	-0.53536***	-0.43755**
	(0.18321)	(0.18356)	(0.16335)	(0.17736)
Constant	2.54242***	-10.84058	-3,549.74935	-700.36786
	(0.14159)	(15.81256)	(3,725.04585)	(7,866.98718)
Observations	435	432	432	432
R-squared	0.06885	0.15291	0.13863	0.16681

PANEL F

VARIABLES	(1) Number of foundations per 10,000 individuals	(2) Number of foundations per 10,000 individuals	(3) Number of foundations per 10,000 individuals	(4) Number of foundations per 10,000 individuals
Russia	-4.51784***	-3.88133***	-4.45913***	-3.83777***
	(1.20037)	(1.25004)	(1.12245)	(1.17108)
Constant	16.75593***	16.16449	-9,134.81874	19,589.79319
	(0.97943)	(124.93197)	(33,032.94874)	(61,254.45442)
Observations	498	494	494	494
R-squared	0.07733	0.11682	0.09727	0.13955

PANEL G

VARIABLES	(1) Referendum turnout	(2) Referendum turnout	(3) Referendum turnout	(4) Referendum turnout
Russia	-4.42986***	-5.18811***	-6.26000***	-5.99394***
	(1.19191)	(1.22248)	(0.92804)	(1.02125)
Constant	53.72488***	-219.75334**	-36376.26978	-56623.54601
	(0.74448)	(98.65190)	(24,886.04329)	(53,564.96172)
Observations	498	494	494	494
R-squared	0.25289	0.34420	0.50350	0.51941

The same conclusion as for 'tax morale' argument can be derived for 'utility supply' argument. Table 9 and 10 suggest that at both borders important differences in utility supply persisted, with notable exception of water supply at the Austria-Russia border. Yet again, given that at both borders changes in utility supply are identified but change in property tax rates is observed only at the Prussia-Russia border, this makes 'utility supply' argument unlikely in explaining difference in tax rates.

Table 9. The effect of partitions on utility supply at the Prussia-Russia border

PANEL A

VARIABLES	(1) Share of houses equipped with gas installation	(2) Share of houses equipped with gas installation	(3) Share of houses equipped with gas installation	(4) Share of houses equipped with gas installation
Russia	-12.54899***	-8.98315**	-10.88174***	-8.49515**
	(4.45825)	(3.67535)	(3.56109)	(3.28696)
Constant	25.31209***	11.52337	15,104.26668	-4.02263e+05***
	(3.76444)	(127.39846)	(178335.03998)	(89,074.63863)
Observations	532	532	532	532
R-squared	0.12755	0.34695	0.37462	0.45613

PANEL B

VARIABLES	(1) Share of houses equipped with water installation	(2) Share of houses equipped with water installation	(3) Share of houses equipped with water installation	(4) Share of houses equipped with water installation
Russia	-2.86704***	-2.56831***	-3.34818***	-2.74184***
	(0.65091)	(0.60891)	(0.66885)	(0.63757)
Constant	96.37452***	95.79351***	19,308.97937	-59172.79106
	(0.34431)	(18.85062)	(68,742.73166)	(38,203.28976)
Observations	532	532	532	532
R-squared	0.42321	0.46608	0.43964	0.45089

PANEL C

VARIABLES	(1) Share of houses equipped with sewerage	(2) Share of houses equipped with sewerage	(3) Share of houses equipped with sewerage	(4) Share of houses equipped with sewerage
Russia	-14.72872***	-12.76815***	-14.48787***	-13.23600***
	(4.13822)	(3.81378)	(3.89730)	(3.69361)
Constant	51.63370***	84.39973	-2.09311e+05	-3.60045e+05***
	(3.09418)	(114.75688)	(211119.76411)	(106980.40648)
Observations	509	509	509	509
R-squared	0.11816	0.22963	0.15742	0.24960

Table 10. The effect of partitions on utility supply at the Austria-Russia border

PANEL A

VARIABLES	(1) revenue1 gas	(2) revenue2 gas	(3) revenue3 gas	(4) revenue4 gas
Russia	-28.91264***	-26.37195***	-37.20405***	-31.79213***
	(5.14485)	(5.02899)	(4.16510)	(4.51412)
Constant	61.22156***	-735.39275*	-8.42512e+05***	-1.46635e+06***
	(3.84808)	(413.27680)	(117483.62916)	(229742.98259)
Observations	493	489	489	489
R-squared	0.35180	0.44153	0.46002	0.48468

PANEL B

VARIABLES	(1) Share of houses equipped with water installation	(2) Share of houses equipped with water installation	(3) Share of houses equipped with water installation	(4) Share of houses equipped with water installation
Russia	-0.16432	-1.29654	-1.33389	-1.56079
	(1.34976)	(1.25625)	(1.12242)	(1.14669)
Constant	89.81115***	143.40201	33,944.75536	52,219.80917
	(0.87733)	(134.17954)	(30,535.87734)	(64,376.08129)
Observations	497	493	493	493
R-squared	0.24044	0.37452	0.39025	0.39573

PANEL C

VARIABLES	(1) Share of houses equipped with sewerage	(2) Share of houses equipped with sewerage	(3) Share of houses equipped with sewerage	(4) Share of houses equipped with sewerage
Russia	-16.71666***	-15.41815***	-17.57733***	-16.51854***
	(4.48579)	(4.47518)	(3.98924)	(4.09459)
Constant	45.45201***	-128.57081	-48259.52695	5,905.47047
	(3.20077)	(370.94735)	(105117.55465)	(220298.22622)
Observations	445	442	442	442
R-squared	0.08597	0.16690	0.17398	0.23223