Dismantled once, diverged forever?

A quasi-natural experiment of Red Army' disassemblies in post-WWII Europe

– EXTENDED ABSTRACT WITH PRELIMINARY RESULTS –

I identify the long-run spatial effects of an exogenous decline in the capital stock on population growth and sectoral change. After WWII, South Austria has been the only region in entire Europe that was initially liberated but not permanently occupied by the Red Army. The demarcation line between the liberation forces was fully exogenous, solely driven by the respective velocity of their jeeps. I use the liberation and the 77 days lasting temporary occupation of Styria after WWII to estimate causal inferences of dismantling and pillaging activities by both the Red Army and its soldiers. First estimates with a sample of direct demarcation line border municipalities indicate a relative population decline of Red Army liberated municipalities of around 15% compared to direct adjacent municipalities. In contrast, pre-WWII population growth shows no differences. A panel from 1934 to 2011 with demographic and economic variables will be constructed. A Regression Discontinuity approach will be employed to estimate discontinuities across the temporary demarcation line on population dynamics and on sectoral change during the last eight decades.

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1. Introduction (and first results)

Economic activity is unequally distributed across space. I show that even among direct neighbor munic-ipalities an exogenous shock in the capital stock persists in terms of municipal population growth for more than seven decades. I therefore find strong support for the hypothesis that economic activity across space is determined by multiple equilibria. I show that an exogenous shock can shape regional economic growth in the very long-run towards a new spatial equilibrium as described by Krugman (1991).[1] This study thus adds to the literature on how current day economic activity over space is influenced by past events. History dependencies of economic variation across space have been found for long-obsolete portage cities (Bleakley and Linn, 2012), airport hub (Redding, Sturm and Wolf, 2011), place-based policies (Kline and Moretti, 2014; von Ehrlich and Seidel, 2015), political uncertainty (Ochsner and Rösel, 2016b), agglomeration effects (Ahlfeldt et al., 2016) or a population shock (Schumann, 2014).

In this paper, I exploit municipal population growth and the change of the sectoral shares along the 77 days lasting demarcation line in the direct aftermath of WWII between the Red Army and the Western Allies (UK and USA) in the Austrian state of Styria. After the cease-fire agreement between the Allies and the German *Reich*, Styria was completely overrun and liberated by the Red Army (from the East), the British (from the South-West) and the US troops (from the North-West) within less than two days. The places where the Allies met became the temporary demarcation line (Iber et al., 2008). This initial occupation of liberated Styria lasted for 77 days (from May 9 to July 24, 1945). Afterwards, entire Styria was completely assigned to the UK occupation zone. The Red Army as well as the US troops left Styria towards their officially assigned occupation zones (Erickson, 1950). During the initial occupation, the Red Army dismantled production facilities and infrastructure on a large scale. Official documents of the Red Army report dismantling of entire plants, electricity infrastructure and railroads (Iber et al. 2008). In addition, Red Army soldiers were engaged into pillaging for their personal enrichment (Stelzl-

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[1] Beside this so-called second-nature and economic of scale explanation, there exist two other competing groups of theories that explain the distribution of economic activities and the distribution of population across space. These are locational fundamentals such resources, topography and climate (e. g., Ellison and Glaeser, 1999; Davis and Weinstein, 2002; Brakman, Garretsen and Schramm, 2004; Ellison, Glaeser and Kerr, 2010), and random walks that lead to a certain economic distribution across space (e. g., Simon,1955; Gabaix, 1999).

Marx, 2012). All private property – such as production tools of craftsmen and farmers, household furniture, and even herds of cattle – had been considered "*as a fair game*" (Bischof, 1999).

The temporary occupation in Styria led to municipalities that were exposed to a massive decline in physical capital, whereas adjacent municipalities were completely unaffected. I use this spatial discontinuity of dismantling and pillaging activities across the temporary demarcation line to analyze if and how this affected municipal population growth and the composition of sectoral shares during the entire post-WWII period. The setting of Styria is unique; the demarcation line has never been any historical or administrative border, neither before nor after the temporary occupation. Additionally, initial occupation has not been a strategic decision by the respective liberators; the demarcation line was – broadly spoken – solely a function of the respective velocity of the Allies' jeeps. This setting allows me to investigate regional economic growth differences in an otherwise historically, culturally and economically homogenous region.

I briefly discuss my initial results. To do so, I focus on municipalities that bordered the temporary, 77 days lasing intra-Styrian demarcation line. Figure 1 compares municipal population dynamics of Red Army liberated municipalities (red line) with its direct adjacent municipalities that have been liberated and temporarily occupied by US and British troops (blue line).[2] Prior to WWII, average municipal population growth did not differ among these two samples of direct neighboring municipalities. However, a municipality that had been liberated by the Red Army and was exposed to dismantling and pillaging activities relatively shrinks by more than 15% during the entire post-WWII period. The largest differences occurs in the direct aftermath of WWII; it seems that Red Army liberated municipalities were a less favored place to live, especially until 1946. However, the initial pattern persists until today, with an increasing relative decline of formerly Red Army liberated municipalities since 1971.

This preliminary results are remarkable. Schumann (2014) finds similar initial population effects due to refugee policies in occupied Germany after WWII. However, he finds persistent population effects only for two decades. My results indicate persistent effects for almost seventy years, with an echo-effect

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[2] Population dynamics are a widely used proxy for spatial economic growth in theoretical core-periphery models (e. g., Helpman, 1998) as well as in the empirical literature (e. g., Redding and Sturm, 2008; Bleakley and Lin, 2012; Kline and Moretti, 2014).

starting 25 years after the temporary demarcation line was abolished. My results thus stand in contrast to the theoretical and empirical literature that addresses spatial economic spillovers.

FIGURE 1: MUNICIPAL POPULATION DYNAMICS ACROSS THE TEMPORARY DEMARCATION LINE
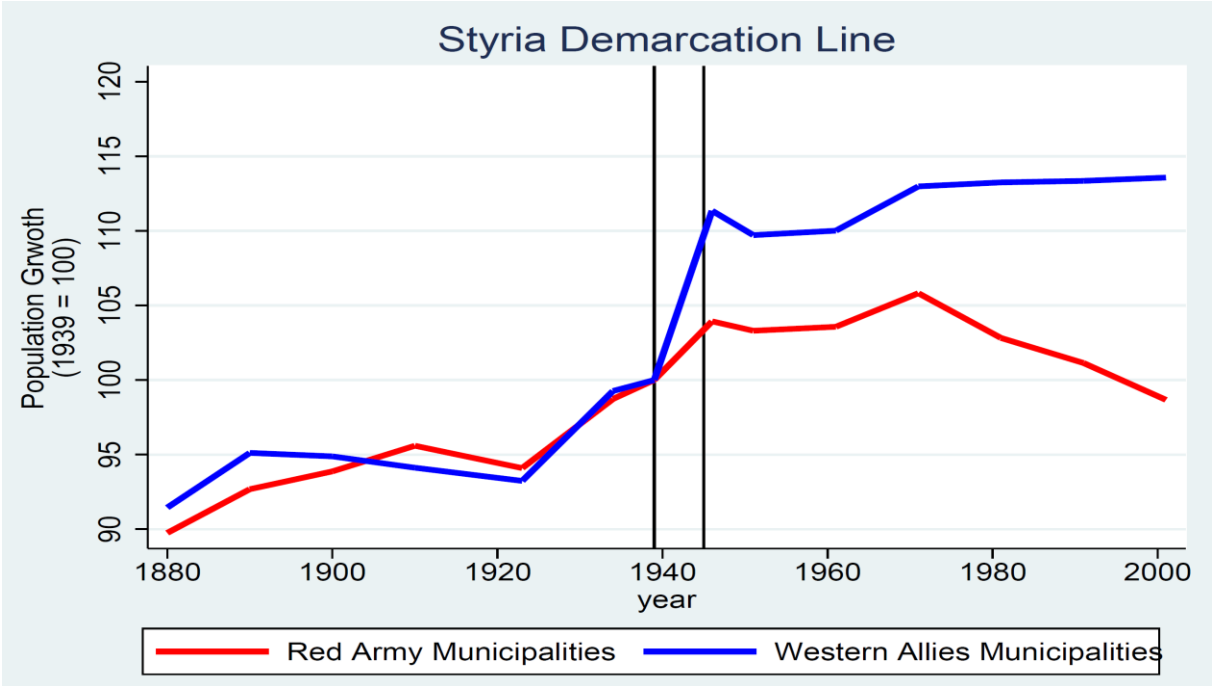
Note: The figure depicts population dynamics (indexed to 100 for the year 1939) for Styrian municipalities that are directly located at the temporary intra-Styrian demarcation line between the Red army and the Western Allies (US and British troops). The red (blue) line shows average population dynamics for Red Army (Western Allies) liberated demarcation line municipalities. The vertical lines show the period of WWII from 1939 until 1945. Data prior to WWII and after 1951 are obtain from *StatistikAustria*. Municipal population data for 1946 are obtained from municipal population statistics based on food vouchers.

I apply a regression discontinuity (RD) approach to estimate (potential) spatial discontinuities across the temporary intra-Styrian demarcation in the cross-section for my variables of interest. These are, e. g., the disruption of population dynamics, demographic composition, the evolution of municipal work-places and sectoral shares across the temporary demarcation line. I plot the cross-sectional (local average) treatment effects over time as shown in Ochsner and Rösel (2016a).

This study adds to the empirical literature on the spatial distribution of economic activity in several ways. First, I corroborate the findings that adverse regional shocks are visible decades or even centuries later. Second, I hope to identify causality on how a negative shock in the capital stock effects both, municipal population dynamics and sectoral change. Third, my empirical setting allows to analyze re-

gional differences in a very narrow geographical context. Fourth, my initial results about long-run effects (as already shown by municipal population growth) would challenge the theoretical and empirical literature on the existence of spatial economic spillovers.

I will proceed as follows: In section 2, I give an historical overview of the liberation and temporary occupation of Styria. Furthermore, I provide official and anecdotal evidence on the extent of dismantling activities by the Red Army. Section 3 introduces the empirical method and the data. Section 4 shows the results and the respective robustness checks. Finally, Section 5 concludes.

2. Historical background

2.1 The liberation and occupation of Styria

In the final stage of WWII, Allied troops from the US, UK, France and the Soviet Union (and partially Yugoslavian and Bulgarian troops) liberated Austria from Nazi occupation. The Red Army[3] arrived in the most eastern parts of Austria already in late March in 1945. On the day of the general ceasefire agreement on May 8, 1945, the frontline between the Red Army and the German troops was along the line Semmering – Fürstenfeld – Feldbach and Radkersburg in the far East of Styria (Iber et al., 2008; Stelzl-Marx 2012). At the same time, US and French troops liberated western and northwestern parts of Austria whereas British forces have been stuck in northern Italy and present-day Slovenia. The bold red lines in Figure 2 depict the location of Allied troops on May 8. Military operations and battles between German and Allied troops took place at this line or behind whereas the main land of Styria has never been a battle field at all (Iber et al., 2008).[4]

Within less than two days, Allied troops overrun and liberated Styria from three different sides (see red arrows in Figure 2). According to Iber et al. (2008) and Stelzl-Marx (2012), US troops met the Red Army in the Enns Valley in the city of Liezen, and British troops run through Carinthia towards the Mur

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[3] The term "Red Army" is used in the entire paper to indicate troops that were under command of the Soviet Union. Most Soviet troops engaged in the liberation of Austria belonged to the Ukrainian Front.
[4] The regions close to the temporary intra-Styrian demarcation line between the Allied troops were therefore no place for land-warfare during WWII.

valley and Köflach in Styria where they met the Red Army on May 9.[5] The place where the Allies met

became the initial intra-Styrian demarcation line for next 77 days. The demarcation line divided valleys

(Enns and Mur valley) following small rives or was drawn arbitrarily between two municipalities on the

flat land. However, the drawing of the temporary demarcation line was fully exogenous. It has neither

been any historical or administrative border in the centuries prior May 9 in 1945, nor afterwards. Addi-

tionally, the demarcation line was neither foreseeable prior May 9 nor a result of negotiation by the

Allies – it is just a function of the respective velocity of the Allies' troops.[6]

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[5] Note that some southern regions in Styria have been liberated by Bulgarian and Yugoslavian (Tito partisans) troops. However, a direct demarcation line between the Red Army and Bulgarian and Yugoslavian troops has never been assigned (Stelzl-Marx, 2012).

[6] The temporary demarcation line followed sometimes natural borders such as rivers (the Enns River in the Enns Valley between the Red Army and US troops and also for a few kilometers the Mur River in the Mur Valley between the Red Army and British troops). However, even in these cases the allied troops arrived on May 9 in the valleys on the opposite side of the respective rivers simultaneously (Stelzl-Marx, 2012).

FIGURE 2: THE LIBERATION OF STYRIA UNTIL MAY 9

——— Allies' Position May 8   ←——— Liberation until May 9   • • • • • Demarcation line until July 24
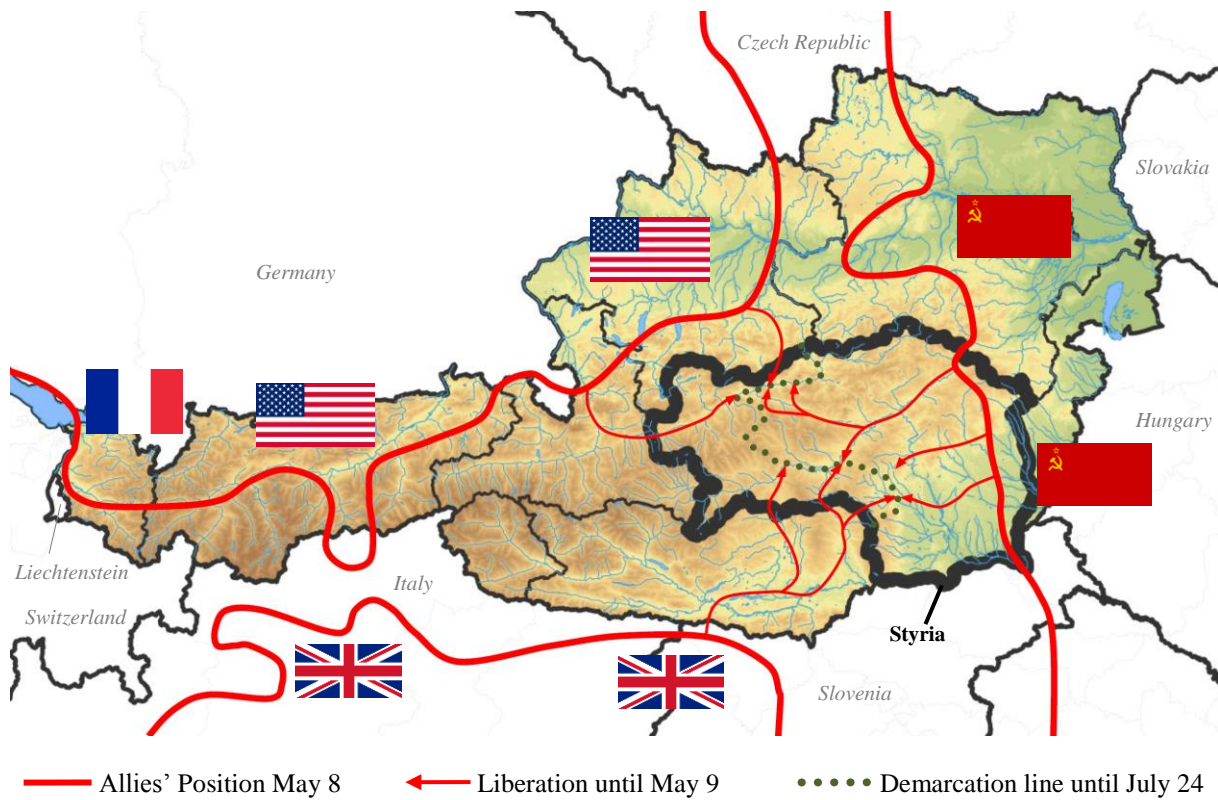
Notes: The map depicts the location of Styria (black bold line) within Austria. Red bold lines show the location of the liberation forces (Soviet Union, United Kingdom, United States and France) at day of the ceasefire agreement between the liberation forces and Nazi Germany. Thin red lines with arrows show (approximately) the way how Styria was overrun until May 9. The locations where the respective liberation forces met became the initial intra-Styrian demarcation line until July 24, 1945 (green dotted line). Sources used are: Iber et al. (2008) and Stelzl-Marx (2012). External borders are shown in the current territorial status.

Figure 3 depicts the temporary occupation of Styrian municipalities by the three Allied troops. Central and eastern Styria (447 municipalities) are under Red Army control, northeastern parts were controlled by the US (38 municipalities) and southeastern parts by British troops (53 municipalities). Three out of 541 Styrian municipalities have been partitioned among the forces. The assignment of municipalities to their respective occupation power follows an official Soviet report translated in Iber et al. (2008).[7]

The division of Styria lasted until July 24, 1945. Based on the joint agreement about the post-WWII occupation of Austria, the Red Army and US troops left Styria towards their officially assigned zones

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[7] In addition, I checked municipal chronicles to assign the municipalities of Kleinlobming, Lassing, Modriach and St. Georgen ob Judenburg to their temporary occupation zone. I would also thank Dr. Ernst Reinhold Lasnik for the information about the occupational treatment of the municipality of Salla.

(Erickson, 1950). Styria itself has been taken over by British forces. Austria was divided into four occupation zones until the *State Treaty* was signed in 1955. The *State Treaty* reestablished Austria as a free and neutral state.

FIGURE 3: TEMPORARY OCCUPATION OF STYRIA FROM MAY 9 TO JULY 23, 1945

■ Red Army   ■ US troops   ■ British troops   ■ Divided Municipalities (not assignable)
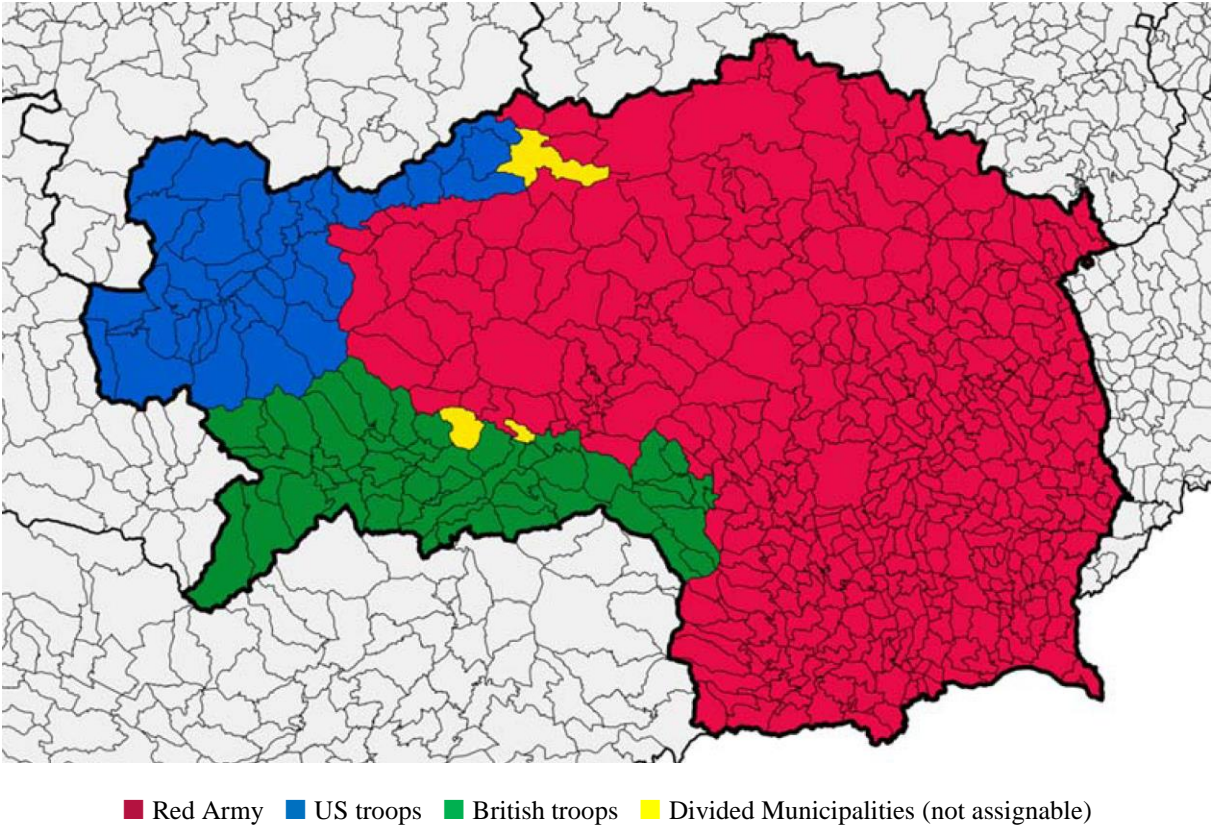
Notes: The map shows Styria with its temporary occupation zones by the Red Army, US and British troops. The temporary occupation lasted 77 days (from May 9 until July 24, 1945). Bold black lines show the border of Styria, thin black lines show municipality borders. The municipalities of Landl, Judenburg and St. Georgen ob Judenburg (yellow) have been divided among the liberation troops. The assignment of municipalities to their occupational treatment follows an official Soviet report translated in Iber et al. (2008).

2.2 Dismantling activities by the Red Army

Dismantling and pillaging activities in Styria in Red Army liberated areas are reported in several historical sources. On the one hand, Iber et al. (2008) collected dismantling resolutions by the Soviet State Defense Committee (GKO). These formal resolutions – signed by Joseph Stalin *after* the dismantling activities took place – aimed at legalizing the removal of entire production plants in the iron and steel, machinery and electric industries (Iber et al., 2008). An agent of the US Office of Strategic Services (OSS) reported that:

> *"Russia's major motivation in evacuating Austrian equipment is obvious: to replace destroyed Soviet producing assets to the maximum extent possible."*[8]

Officially, the Soviet Union claimed that mainly the so-called "*German assets*" will be confiscated and shipped away. However, the Red Army made no special effort in distinguishing between equipment installed by the Germans after 1938 (German assets) and machinery already in operation prior to the accession of Austria by Nazi Germany (Bischof, 1999).

On the other hand, a wide range of literature reports informal dismantling and pillaging of assets by both, the Red Army and by its soldiers. Red army soldiers were allowed to send bundles back home for free. They interpret this as an indirect request for pillaging (Stelzl-Marx, 2012). Thus, everything in the Red Army liberated part of Styria was exposed to be pillaged: small production facilities of craftsmen, furniture in private apartments, farming tools and even herds of cattle were driven towards Hungary (Eberhart, 1995; Pickl, 1995; Bischof, 1999). Bischof (1999) summarizes written and oral-history sources of pillage-witnesses and village chroniclers in the following way:

> *"In Styria all private property of more or less portable nature was regarded as a fair game."*[9]

The Red Army dismantled also a whole electric power station, electricity infrastructure such as transmission lines, electrical overhead cables and transformers, railroads and locomotives (Iber et al. 2008). This resulted in an electricity shortage. Additionally, raw materials and semi-finished goods have been carried out of Styria to a large extent (Pickl, 1995; Iber et al., 2008). Note that Styria might be more exposed to dismantling and pillaging activity than other Red Army liberated regions. This is caused by the fact that the Red Army was well aware that it has to leave Styria towards its officially assigned occupation zone. Eberhart (1995) and Pickl (1995) report an increasing amount of pillaging events during the withdrawal of the Red Army. This indicates an "*devil-may-care*" mentality.

Dismantling and pillaging activities took place exclusively in the part of Styria liberated and temporary occupied by the Red Army. Thus, the liberation on May 9 decided whether a municipality was exposed

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[8] Cited after Bischof (1999, p. 38).
[9] Cited after Bischof (1999, p. 38) based on Eberhart (1995) and Pickl (1995).

to these activities or not. Municipalities where US or British troops arrived first were lucky to be not affected, whereas their adjacent municipalities had to live under much harsher conditions for 77 days.

3. Empirical strategy

3.1 Identification

I test whether dismantling activities by the Red Army during its temporary occupation of central and eastern Styria impacts regional economic growth in the long-run. I employ a spatial regression discontinuity (RD) approach (e. g., Dell, 2010; Schumann, 2014; von Ehrlich and Seidel, 2015; Becker et al., 2016; Ochsner and Rösel, 2016a). This allows me to identify geographical discontinuities in population growth and the evolution of sectoral shares between Red Army and Western Allies liberated municipalities in Styria. In this study, all identifying assumptions described in Lee and Lemieux (2010) for the spatial RD approach are met. First, the location of the intra-Styrian demarcation line was fully exogenous. The demarcation line does not coincide with any historical or administrative border neither in the centuries prior to the liberation in May 1945 nor after July 24, 1945, when entire Styria became part of the UK occupation zone in Austria. Second, the units of observation (municipalities) are not able to manipulate the assignment variable. Municipalities were not able to self-select into occupation zones. The liberation of Styria and the resulting demarcation line was – broadly speaking – solely a function of the velocities of the liberators' jeeps. RD is thus a powerful approach to estimate the (local average) treatment effect at the temporary demarcation line. RD controls for unobservable heterogeneity across treated and non-treated units that are arbitrarily close to each other (Imbens and Lemieux, 2008).

My baseline model uses the distance to the temporary intra-Styrian demarcation line as a single-dimensional running function. I estimate a cross-section RD for the variable of interest as follows:

$$s_i = \alpha + \beta RA_i + [\gamma_1 d_i + \gamma_2 (RA_i \times d_i) + \gamma_3 (d_i \times d_i) + \gamma_3 (RA_i \times d_i \times d_i)] + \varepsilon_i \qquad (1)$$

s_i denotes the variable of interest (e. g., population growth, changes in sectoral share, etc.) in municipality i. RA_i is a dummy variable that equals one if a municipality was liberated by the Red Army and zero otherwise (US or British Army). The term in square brackets represents the RD polynomial that controls for smooth functions of geographic location. Herein, d_i measures the geographical distance in

kilometers to the temporary intra-Styrian demarcation line. In the baseline specification in equation (1), I allow for a quadratic form of my running variable. I also run several robustness checks where I allow for other polynomial orders as well as interactions with longitude and latitude as proposed by Dell (2010). The (local average) treatment effect at the threshold is captured by coefficient β. Hence, β can be interpreted as the shift in the variable s_i of marginally crossing the temporary demarcation line from Western Allies to Red Army liberated municipalities. α is a constant. ε_i is the error term. We apply standard errors robust to heteroscedasticity (Huber-White sandwich standard errors; see Huber, 1967; White, 1980).

3.2 Data

My self-compiled dataset comprises population figures (1869 to 2011),[10] demographic variables and work occupation of local residents (1934 to 2011),[11] workplaces and commuting behavior of local residents (1971 to 2011) and data for 2011 on municipal business tax revenues[12] of all 541 Styrian municipalities. The whole analysis is based on the territorial status of 2011. All data has been transformed to the 2011 territorial status.[13]

[To be extended: Descriptive Statistics]

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[10] Municipal population data are obtained from *StatistikAustria* for 1869 to 1939 and for 1951 to 2011. For the year 1946 I use municipal population statistics based on food vouchers (*Gemeindeverzeichnis von Österreich 1946*).

[11] Data sources for municipal demographic variables and work occupation are: *Die Ergebnisse der Österreichischen Völkszählung vom 22. März 1934, Heft 5* for 1934; *Ergebnisse der Volks-, Berufs- und Betriebszählung vom 17. Mai 1939 – Heft 13: Alpen- und Donau-Reichsgaue* for 1939; *Ergebnisse der Volkszählung vom 1. Juni 1951 nach Gemeinden, Heft 8* for 1951 and *Ergebnisse der Volkszählung vom 21. März 1951 – Steiermark, Heft 9* for 1961. Data from 1971 onwards are obtained from the statistical database *STATcube* by *StatistikAustria*.

[12] Data sources for municipal workplaces, commuters and business tax revenues are: *Ein Blick auf die Gemeinde* and *STATcube* (both provided by *StatistikAustria*).

[13] The number of Styrian municipalities decreased from 1030 in 1934 to 541 (539) in 2011. Mergers of municipalities during this time did not take place across the temporary intra-Styrian demarcation line. In January 2015, a big municipal reform took place in Styria which decreased the number of municipalities further to 287. Thus, the most current territorial status of 2015 would not allow to identify long run effects of dismantling activities anymore since municipalities have been merged across the former demarcation line.

4. Results

I am interested in the evolution of RD treatment effect over time. I estimate (potential) spatial disconti-nuities across the temporary intra-Styrian demarcation in the cross-section for my variables of interest. I plot the cross-sectional treatment effect over time as shown in Ochsner and Rösel (2016a).

[To be extended]

5. Conclusion

I show that differences in economic activity across space is persistently shaped by an exogenous shock in the capital stock. Persistent differences survived for almost seventy years. These results are even more remarkable since my primary unit of analysis are adjacent municipalities. Multiple equilibria thus exist even within a very narrow geographical region. My results thus torpedo literature on the existence of spatial economic spillovers.

[To be extended]

References

Ahlfeld, G., Redding, S., Sturm, D. and N. Wolf (2016), The Economics of Density: Evidence from the Berlin Wall, *Econometrica* (forthcoming).

Bischof, G. (1999), Austria in the First Cold War, 1945-55: The Leverage of the Weak (Basingstoke: Palgrave Macmillan).

Bleakley, H. and J. Lin (2012), Portage and Path Dependence, *Quarterly Journal of Economics* 127: 587–644.

Brakman, S., Garretsen, H. and M. Schramm (2004), The strategic bombing of German cities during World War II and its impact on city growth, *Journal of Economic Geography* 4: 201–218.

Eberhart, H. (1995), Wideraufbau und Nachkriegsalltag: das Tagebuch von Anton Pirchegger, in Beer, S. (ed) *Die „britische" Steiermark 1945 – 1955* (Graz: Selbstverlag der Historischen Landeskommission für Steiermark): 361–387.

Davis, D. und D. Weinstein (2002), Bones, Bombs, and Break Points: The Geography of Economic Activity, *American Economic Review* 92: 1269–1289.

Dell, M. (2010), The Persistent Effects of Peru's Mining Mita, *Econometrica* 78: 1863–1903.

Ellison, G. and E. L. Glaeser, (1999). The GeographicConcentration of Industry: Does Natural Advantage Explain Agglomeration?, *American Economic Review* 89: 311–316.

Ellison, G., Glaeser, E. L. and W. R. Kerr (2010), What Causes Industry Agglomeration? Evidence from Coagglomeration Patterns, *American Economic Review* 100: 1195–1213.

Erickson, E. (1950), The zoning of Austria, *Annals of the American Academy of Political and Social Science* 267: 106–113.

Gabaix, X. (1999), Zipf's Law and the Growth of Cities, *American Economic Review* 89: 129–132.

Helpman, E. (1998), The Size of Regions, In Pines, D., Sadka, E. and I. Zilcha (eds) T*opics in Public Economics: Theoretical and Applied Analysis* (Cambridge: Cambridge University Press): 33–54.

Huber, P. (1967), The behavior of maximum likelihood estimates under nonstandard conditions, *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability*: 221–233.

Holmes, T. J. and S. Lee (2012), Economies of Density versus Natural Advantage: Crop Choice on the Back Forty, *Review of Economics and Statistics* 94: 1–19.

Iber, W. M., Knoll, H., Karner, S., Pickl, O., Pruegger, H., Ruggenthaler, P., Wonisch, A. and S. Stern (2008), Die Rote Armee in der Steiermark – Sowjetische Besatzung 1945 (Graz: Leykam Buchverlag).

Imbens, G. and T. Lemieux (2008), Regression discontinuity designs: a guide to practice, *Journal of Econometrics* 142: 615–635.

Kline, P. and E. Moretti (2014), Local Economic Development, Agglomeration Economies and the Big Push: 100 Years of Evidence from the Tennessee Valley Authority, *Quarterly Journal of Economics* 129: 275–331.

Krugman, P. (1991), Increasing Returns and Economic Geography, *Journal of Political Economy* 99: 483–499.

Lee, D. and T. Lemieux (2010), Regression discontinuity designs in economics, *Journal of Economic Literature* 48: 281–355.

Ochsner, C. und F. Rösel (2016a), Migrating Extremists, CESifo Working Paper No. 5799, Munich.

Ochsner, C. und F. Rösel (2016b), Long-run Spatial Effects of Political Uncertainty: Evidence from Occupied Post-WWII Austria, mimeo, Ifo Institute – Dresden Branch, Dresden.

Pickl, O. (1995), Das Kriegsende 1945 und die frühe Besatzungszeit im mittleren Mürztal: Ein Beitrag zur Vergangenheitsbewältigung nach zeitgenössischen Berichten, in Beer, S. (ed) *Die „britische" Steiermark 1945 – 1955* (Graz: Selbstverlag der Historischen Landeskommission für Steiermark): 277–295.

Redding, S. und D. Sturm (2008), The Costs of Remoteness: Evidence from German Division and Re-unification, *American Economic Review* 98: 1766–1797.

Redding, S., Sturm, D. und N. Wolf (2011), History and Industry Location: Evidence from German Airports, *Review of Economics and Statistics* 93: 814–831.

Schumann, A. (2014), Persistence of Population Shocks: Evidence from the Occupation of West Germany after World War II*, American Economic Journal: Applied Economics* 6: 189–205.

Simon, H. (1995), On a Class of Skew Distribution Functions, *Biometrika* 42: 425–440.

Stelzl-Marx, B. (2012). Stalins Soldaten in Österreich: Die Innensicht der sowjetischen Besatzung 1945–1955 (Munich Böhlau Verlag & Vienna: Oldenbourg Verlag).

von Ehrlich, M. and T. Seidel (2015), The Persistent Effects of Place-Based Policy: Evidence from the West German Zonenrandgebiet, CESifo Working Paper No. 5373, Munich.

White, H. (1980), A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroscedasticity, *Econometrica* 48: 817–838.