



Shades of empire: Evidence from Swedish and Polish–Lithuanian partitions in the Baltics

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Summary: In this study, we argue for the post-imperial persistence of Swedish and Polish–Lithuanian legacies in the Baltic region. We find that there is a positive post-imperial persistence of the Swedish legacy that explains modern Baltic development. Higher historical shares of Lutherans, Germans, and landowners predict higher levels of contemporary socio-economic development in the Swedish partition of South Livonia than in the Polish–Lithuanian partitions of Courland and Lettgallia.

Twitter: In this study, we show how the Swedish and Polish–Lithuanian Empires have shaped the long-run socio-economic development of Latvia and Estonia.

Abstract

In this study, we explore the long-run effects of Swedish and Polish–Lithuanian imperial legacies in the Baltic region. Using a robust regression discontinuity design, we identify persistent differences in socio-economic development across the South Livonia–Courland and the South Livonia–Lettgallia borders that emerged as a result of the Altmark Truce (1629) between Sweden and Poland–Lithuania. We find that there is a positive post-imperial persistence of the Swedish legacy that explains modern Baltic development. Our results are robust to the RD estimation of the post-1629 Swedish–Swedish border between North Livonia and Estland, the Pale of Settlement, spatial noise, placebo outcomes, and the introduction of a quadratic polynomial, as well as different bandwidths. Higher historical shares of Lutherans, Germans, and landowners may predict higher levels of contemporary socio-economic development in the Swedish partition of South Livonia than in the Polish–Lithuanian partitions of Courland and Lettgallia.

KEYWORDS

Baltics, development, empire, human capital, Sweden, Poland–Lithuania

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The clash of empires in the Baltics between the sixteenth and eighteenth centuries produced lasting effects on the region's socio-economic development. In the aftermath of the breakup of the Livonian Confederation (1561), Poland, Sweden, and later Russia emerged as institution-building powers whose cultural and institutional influence shaped the economic performance of the Baltic region. In this study, we argue that the Swedish imperial legacy is more conducive to higher levels of socio-economic development than the Polish–Lithuanian imperial legacy. All four imperial territories of Courland, (North and South) Livonia, Estland, and Lettgallia, had very similar histories under the auspices of the Livonian Confederation before the mid-sixteenth century, and then followed similar administrative trajectories after the mid/late eighteenth century. Lettgallia, Courland, and South Livonia were part of a region that is now contemporary Latvia, whereas Estland and North Livonia made up what is contemporary Estonia.

Figure 1 shows the four historical regions of the Baltics including the contemporary state border between Latvia and Estonia that divides Livonia into North and South Livonia. Hence, we differentiate between South Livonia, the part of Livonia in present-day Latvia, and North Livonia, the part of Livonia in present-day Estonia.¹ Figure A.1 delineates the Swedish from the Polish–Lithuanian imperial zone whilst preserving the modern border between the two Baltic states.

We underscore that the control of Estland and Livonia by the Swedish Empire and the control of Lettgallia and *de jure* also Courland by the Polish–Lithuanian Commonwealth between the mid-sixteenth/early seventeenth and mid/late eighteenth centuries bolstered two distinctive paths of socio-economic development that can be traced in contemporary Latvia and Estonia. In this study, we examine the persistence of the post-1629 historical Swedish–Polish borders in the Baltics, that is, the South Livonia–Courland border and the South Livonia–Lettgallia border, which are located within the territory of modern Latvia. The North Livonia–Estland border, located within the territory of modern Estonia, is used as a robustness check for our main argument, as both imperial regions belonged to Sweden as of 1629.

The role of historical borders has been crucial in understanding regional differences within the same country (the examples of Poland and Romania are characteristic in that direction). Furthermore, the impact of special administrative borders within a larger state such as the Pale of Settlement also appears to be significant, thereby revealing the intergenerational transmission of cultural preferences. Moreover, unlike all other related studies, we concentrate on early modern borders (sixteenth–seventeenth centuries) rather than exploiting the territorial contours of nineteenth-century or early twentieth-century European empires. That way, we underscore that patterns of imperial succession in critical world regions such as Eastern Europe may have left a much deeper imprint on their current socio-economic development than initially thought. Furthermore, the discussion of mediating mechanisms that relate to imperial Russia or interwar independence offers a novel and integrated perspective on the long-run transformation of the Baltic region.

The empirical framework employs a robust regression discontinuity design on the basis of sub-national (municipal and county-level) state data and the Life-In-Transition Survey (LiTS) III. We compare higher education shares, income, unemployment, preferences for law obedience, and

¹ It is important to underscore that a decade before the Great Northern War (1700–1721), the Swedish Empire planned the administrative division between South and North Livonia, however, this reform was never implemented (Kasekamp, 2010; Oberlender, 2012; Piirimae, 1997; Raun, 1991). The disruptive effect of the Great Northern War on Swedish reforms may also be observed in Loit (2005).



FIGURE 1 Contemporary districts and historical borders after the breakup of the Livonian Confederation (1561). *Source:* Author maps. (North and South) Livonia is in green, Estland in yellow, Courland in orange, and Lettgallia in blue. Grey districts are territories of modern Latvia and Estonia that belonged to Poland-Lithuania (in Lettgallia and Courland) and to Russia (in Livonia). The contemporary Latvian-Estonian border is also included.

market economy as well as trust in religious institutions across the South Livonia-Courland and the South Livonia-Lettgallia borders.² We run McCrary regression discontinuity (RD) density tests (2008) and manipulation testing on the basis of density discontinuity within a bandwidth of 100 km to examine the absence of discontinuities across the border related to confounding factors (see Figures A.4 and A.5).³ We observe no discontinuities in either the state (municipal/county) or the LiTS III data. The logic of the McCrary density test and its extension by Cattaneo and his

² The demarcation of Swedish-Polish imperial borders as a result of the Altmark Truce (1629) occurred along river borders.

³ Cattaneo, Jansson, and Ma, 'Manipulation testing'.



coauthors is related to the validity of the RD design as an identification strategy. Utilizing testing, we confirm the absence of any significant discontinuities across the cutoff points—in our case, the imperial borderlines—and therefore of manipulated forcing variables. In this way, the choice of our identification strategy is confirmed.

The empirical results confirm the persistence of historical borders in terms of socio-economic development in favour of the former Swedish-dominated areas. We find significantly higher shares of higher education graduates, higher levels of income, and lower levels of unemployment in former South Livonia than in former Courland. Furthermore, preferences for law obedience and market economy as well as trust in religious institutions are stronger in former South Livonia than in Courland. Similarly, regarding the South Livonia–Lettgallia border, we observe higher levels income, preferences for law obedience, and market economy, as well as trust in religious institutions on the South Livonian side of the border.

To explore the transmission channels between the seventeenth and the twenty-first centuries, we elaborate on the following historically relevant mediating variables: the share of Lutherans, the share of Germans, and the share of primary education graduates from the imperial Russian census of 1897; the share of Germans from the 1935 census of independent Latvia; the share of landowners who were peasants from the imperial Russian agricultural censuses of 1878/1885 and 1905; the size of land used by peasant communes from the 1905 land census of the Russian Empire; the size of land owned by nobles from the 1905 land census of the Russian Empire; and the share of serfs in 1858 from the Bugge and Nafziger (2021) study. We find that higher shares of Lutherans (1897) predict lower levels of unemployment in the Swedish partition of South Livonia than in the Polish–Lithuanian partition of Courland. Furthermore, a higher German share (1897 and 1935) predicts higher levels of income and higher education graduates in South Livonia than in Courland, as well as higher levels of income in South Livonia compared with Lettgallia. Whilst the share of primary education graduates (1897) reveals no significance as a transmission channel, landownership concentration in the Baltics measured as the share of landowners who were peasants (1878/1885) explains stronger preferences for the market economy across both former imperial borders. This is also the case for higher education shares and trust in religious institutions across the South Livonia–Lettgallia border as well as for income across the South Livonia–Courland border. The size of land owned by peasant communes and the share of serfs appear not to matter as potential transmission mechanisms for either of the two Swedish–Polish borders. Moreover, the size of land owned by nobles may explain higher shares of higher education graduates in former South Livonia compared with former Lettgallia. Nevertheless, it is not relevant as a mediating mechanism for the South Livonia–Courland border.

Our results are robust to the different borders and estimation strategies. We perform RD estimations on both the post-Altmark (1629) internal border between North Livonia and Estland and the Pale of Settlement (1772/1791), with our results holding in both cases. Furthermore, we control for spatial noise, placebo outcomes as well as a quadratic polynomial and different bandwidths. The two tested imperial borders (South Livonia–Courland and South Livonia–Lettgallia) remain significant.

The study is organized as follows. Section I discusses the related literature on the political economy of culture and persistence in Eastern Europe. In Section II, we present the historical setting that led to the emergence of the Swedish–Polish imperial borders in the Baltics. In Section III, we describe the data and the empirical framework. Section IV presents the main results of our paper, whilst Section V reports several robustness checks. Section VI provides a discussion on mechanisms of persistence. Section VII concludes.



I | LITERATURE

This study offers novel insights into the economic development of the Baltic region, which has until now remained largely understudied in the literature. We build on research that has underscored the centrality of the Baltics in European trade and market integration since the sixteenth century.⁴ Swedish expansion in Livonia in the early seventeenth century restricted Russian access to European markets and led to the accumulation of mediatory rents for Swedish and German merchants.⁵ Positive perceptions of Swedish imperial rule, which have been associated with the creation of the predecessor institution to the University of Tartu, preliminary judicial institutions, and a decrease in the number of manors were inherent to Estonian national historiography and the crafting of an Estonian Nordic identity. The Swedish rule of Estland and North Livonia was seen as the harbinger of the country's national awakening and the first breakaway from Baltic German rule.⁶ Furthermore, the higher economic performance of Estonia compared with Latvia during the post-socialist transition period may be attributed to culture, its lower levels of diversity, and its stronger commitment to the Protestant ethic.⁷ The economic significance of Sweden for the economies of Latvia and Estonia was reinforced following European Union (EU) enlargement in 2004 with the creation of the Baltic Sea Region strategy.⁸

Our contribution suggests that the borders that emerged as a result of the breakup of the Livonian Confederation have produced lasting and significant differences. Eastern Europe offers a good example of the creation of such 'political' borders due to the incorporation of Eastern and Southern European territories into the European superpowers—the Prussian, Habsburg, Russian, and Ottoman Empires—before World War I. Grosjean indicates that pre-World War I imperial legacies persist through culture and thus have a stronger impact on social trust compared with events of more recent history, such as the Soviet Union, the European Union, or contemporary nation-states.⁹ Becker et al. show that territories in East-Central Europe (Poland, Ukraine, Romania, Serbia, and Montenegro) that belonged to the Habsburg Empire exhibit higher levels of trust and less corruption due to the survival of individual cultural norms for local public services.¹⁰

We identify historical Lutheranism (1897) as a crucial mechanism for the transmission of the Swedish imperial legacy into the twenty-first century and its positive effects on Latvian and Estonian socio-economic development. Becker et al. argue for the existence of the Lutheran–Catholic economic divide in nineteenth-century Prussia, thus partially confirming the Weber thesis.¹¹ Nevertheless, their proposed channel is the acquisition of literacy, as Lutherans were expected to be able to read the Bible to perform their religious duties. They corroborate this result by finding a positive effect of Protestantism on schooling in 1816, drawing evidence from

⁴ Jacks, 'Market integration'.

⁵ Šaskolskij, 'New phenomena in the Baltic trade'.

⁶ Kuldkepp, 'The Scandinavian connection in early Estonian nationalism'.

⁷ Norkus, 'Why did Estonia perform best?'.

⁸ Vanags, 'Economic integration and cohesion'.

⁹ Grosjean, 'The Weight of History on European Cultural Integration'. Grosjean (2011a) also argues that the legacy of the Ottoman Empire has contributed to financial underdevelopment in South-Eastern Europe with respect to banking penetration.

¹⁰ Becker et al., 'The Empire Is Dead, Long Live the Empire!'.

¹¹ Becker and Woessmann, 'Was Weber Wrong?'.



193 Prussian counties before the Industrial Revolution.¹² [Cantoni](#), however, draws evidence from the Holy Roman Empire to argue that there is no effect of Protestantism on city-level economic performance.¹³ Similarly, [Kersting et al.](#) find no robust effect of Protestantism on human capital outcomes and economic performance.¹⁴

As mentioned earlier, imperial borders split contemporary European states and therefore allowed the identification of imperial legacies within one particular country. Modern Poland offers an outstanding example, as it was divided by the Habsburg, Russian, and Prussian Empires. As [Grosfeld et al.](#) point out, there are persistent differences in religious practices and beliefs in democratic ideas in Polish–Lithuanian communities around the former borders.¹⁵ Poles are less religious in the ‘Russian’ zone of Poland due to the oppression of the Catholic Church by the Russian Empire.¹⁶ Furthermore, people living in the ‘Austrian’ zone have a more positive attitude towards democracy, suggesting that the administrative, cultural, and political autonomy granted by the Habsburgs created a persistent legacy of democracy.¹⁷ [Wysokinska](#) argues for the persistence of Polish–Lithuanian partitions and finds robust economic discontinuities in terms of farm size as well as a rise in revenues and personal income tax across the Prussian–Russian border.¹⁸ Both Prussian and Austrian partitions in Poland reveal higher levels of social capital (measured by voter turnout in national referenda) as compared with their Russian counterpart.¹⁹ The differentiating role of imperial institutions is thus crucial in explaining contemporary outcomes. In this discussion, we add the role of landownership as a channel that unveils the impact of early modern imperial borders on modern economic systems by drawing evidence from late nineteenth-century/early twentieth-century imperial Russian data.

[Bukowski](#) suggests that nineteenth-century partitions of Poland have produced differential effects on contemporary student performance.²⁰ Whilst there is no significant effect across the Prussian–Russian border, the Austrian–Russian and the Austrian–Prussian borders reveal crucial differences in favour of the Austrian side of the border, and in the Russian and Prussian partitions, Polish language instruction was restrained in the second half of the nineteenth century.²¹ Concerning the Prussian–Austrian border, the difference is due to the active support of Polish language instruction by local schools in the Austrian partition. This identity formation generated positive norms towards the education system, which in turn have been transmitted through generations and explain parental and student effort.²² [Backhaus](#), however, indicates that Polish–Lithuanian partitions persisted in terms of human capital outcomes (literacy, school enrolment) before World War I.²³ However, they faded away completely in the aftermath of World War II as a result of intergenerational education mobility and convergence in terms of literacy and

¹² [Becker and Woessmann](#), ‘The effect of Protestantism on education before the industrialization’.

¹³ [Cantoni](#), ‘The Economic Effects of the Protestant Reformation’.

¹⁴ [Kersting et al.](#), ‘Weber Revisited: The Protestant Ethic and the Spirit of Nationalism’.

¹⁵ [Grosfeld and Zhuravskaya](#), ‘Cultural vs. Economic Legacies of Empires’.

¹⁶ *Ibid.*

¹⁷ *Ibid.*

¹⁸ [Wysokinska](#), *Institutions or Culture?*, SSRN Working Paper (2017).

¹⁹ *Ibid.*

²⁰ [Bukowski](#), ‘How History Matters for Student Performance’.

²¹ *Ibid.*

²² *Ibid.*

²³ [Backhaus](#), *Fading Legacies*, EHES Working Paper No. 150 (2019).

enrolment. This is in line with our finding on the German shares of 1897 and 1935 as transmission mechanisms of pro-developmental Swedish institutions, which is in line with the logic of a conglomerate empire ruling through decentralized interest groups.

Trenkler et al. identify short-run persistence patterns of Polish–Lithuanian partitions following the Polish reunification in 1919, which vanished as early as in the mid-1920s.²⁴ In contrast to their threshold cointegration analysis, which identifies price convergence and concentrates on the effectiveness of state-building, we focus on religion and institutions as the main mechanisms that produce significant contemporary discontinuities across the borders of the former Swedish and Polish–Lithuanian partitions.²⁵

Our paper disentangles Baltic development from the context of the two world wars and the historical German–Russian competition in Eastern Europe by highlighting the significance of two prior imperial powers in the region, Sweden and Poland. Peisakhin observes that Ukrainians living in the ‘Habsburg’ zone of Ukraine are more pro-European, whereas the population on the side of the former Russian Empire is more oriented towards Russia and the Commonwealth of Independent States.²⁶ Culturally intact families and state schools—in the case of family alignment with the state or identity-indifferent families—are identified as the main institutions of identity transmission.²⁷ Imperial persistence is also observed by Walker across the internal Habsburg–Ottoman border in Romania when it comes to savings.²⁸ Grosfeld et al. identify an anti-Jewish cultural legacy in the former territories of the Pale of Settlement, and anti-Semitism measured by distance to historical pogroms in the Russian Empire constitutes the key mechanism for the persistence of anti-market culture and bonding trust due to people living side-by-side with an ethnic group that they perceived as a rival.²⁹ Miho et al. suggest that the Stalinist deportations during World War II produced the diffusion of gender equality norms from Western and Central Russia to Central Asia and Siberia through a horizontal between-group cultural transmission mechanism.³⁰

II | HISTORICAL BACKGROUND

Although initially parts of the same political entity, that is, the Livonian Confederation, the four regions of the Baltics—Estland, (North and South) Livonia, Courland, and Lettgallia—followed different historical routes when the Livonian Confederation collapsed (Figures 1 and A.1). These divergent paths shaped distinct historical institutions and hence led to differences across local cultures. When the Reformation reached the Baltics at the beginning of the sixteenth century, Lutheranism became the leading religion in the Livonian Confederation. Figure 2 shows the

²⁴ Trenkler and Wolf, ‘Economic integration across borders: The Polish interwar economy 1921–1937’.

²⁵ In the post-communist context, several scholars deal with the long-run historical and institutional framework of Polish and East-Central European political behaviour (Snyder, 1995; Zarycki, 2000; Hannan, 2006; Janzacak, 2015). In the post-Ottoman Turkish context, Arbatlı and Gokmen (2023) find that modern Turkish districts with a stronger Greek or Armenian presence during the late Ottoman period are inclined to be more developed, more urbanized, and more densely populated today due to human capital spillovers and asset transfers between minority and Muslim populations.

²⁶ Peisakhin, *In History’s Shadow*, Juan March Institute working paper no. 2012/272 (2012).

²⁷ *Ibid.*

²⁸ Walker, ‘Historical Legacies in Savings: Evidence from Romania’.

²⁹ Grosfeld et al. ‘Persistent anti-market culture: A legacy of the Pale of Settlement after the Holocaust’.

³⁰ Miho, A. et al., *Diffusion of Gender Norms: Evidence from Stalin’s Ethnic Deportations*.



FIGURE 2 Contemporary districts and feudal principalities before the breakup of the Livonian confederation. *Source:* Author maps. Borders of historical regions and borders of counties and municipalities in Estonia and Latvia today. Different colours are assigned to feudal principalities of the Livonian confederation: territories under the military administration of the Livonian Order (white), Bishopric of Courland (orange), City of Riga (light green), Archbishopric of Riga (green), Bishopric of Dorpat (dark grey), and Bishopric of Ösel-Wiek (light grey).

administrative borders of the feudal principalities of the Livonian Confederation. The decline of the Teutonic Order coincided with the rise of Muscovy in the east, Sweden in the west, and Poland–Lithuania in the south. Finally, the Livonian Confederation dissolved during the Livonian Wars, which started in 1558, when the Teutonic Order was outnumbered by Muscovy.³¹

Russian expansion encouraged fierce competition in the former territories of the Livonian Confederation. Bishops and cities sought protection through neighbouring powers. From 1558

³¹ O'Connor, K., *The History of the Baltic States*; Kasekamp, *A History of the Baltic States*; Jacobson et al., 'What is a Region? Regions in European History'

**TABLE 1** Imperial rule in the Baltics.

Region	Thirteenth–sixteenth century	Swedish, Polish, and Danish rule	The Russian empire	Present
<i>Estland</i>	Duchy of Estonia (Danish Estonia) 1219–1346 Livonian Confederation 1346–1561	Swedish Estonia 1561–1721	Governorate of Estland 1721–1918	Estonia (North)
<i>North Livonia</i>	Livonian Confederation 1346–1561	Livonia* 1561–1629 Swedish Livonia 1629–1721 Danish Ösel/Saaremaa 1559–1645	Governorate of Livonia 1721–1918	Estonia (South)
<i>South Livonia</i>		Livonia* 1561–1629 Swedish Livonia 1629–1721	Governorate of Livonia 1721–1918	Latvia (Vidzeme)
<i>Lettgallia</i>		Polish Livonia 1562–1772	(Part of) Vitebsk governorate 1772–1918	Latvia (Latgale)
<i>Courland</i>		Duchy of Courland* 1562–1795 Danish Bishopric of Courland (1560–85)	Courland governorate 1795–1918	Latvia (Kurzeme and Zemgale)

Notes: *Vassals to the Polish–Lithuanian Commonwealth.

Sources: Kasekamp, 2010; O'Connor, 2003; Plakans, 2011.

to 1721, Russia, Sweden, and Poland–Lithuania competed for domination in the Baltic region.³² In the early years of the Livonian Wars (1558–83), Russia dominated the region. An exception was Swedish Estonia, established by Sweden in the north of the former Livonian territory, and the former territory of Bishopric of Ösel-Wiek (Saaremaa), which was sold to the Danish king in 1559 and remained under Danish rule until 1645. However, Russia later lost its former holding to Sweden and Poland–Lithuania. The Livonian Wars were followed by the Polish–Swedish War (1600–29). After a series of Polish–Swedish struggles, Swedes conquered most of the area, except for the southern regions of Lettgallia and Courland.³³

Table 1 outlines the ruling regimes in the Baltic regions from the thirteenth century until 1918. Tables A.1 and A.2 provide an overview of the historical development of locality names and institutions in South Livonia, Courland, and Lettgallia, as well as in North Livonia and Estland.

³² The new borders, drawn after the breakup of the Livonian Confederation, were driven by the relative military strength of Muscovy, Sweden, and Poland–Lithuania. They did not coincide with the administrative division in Livonian territories before that, except for Estland, which was ruled by the Danes in the thirteenth century (O'Connor, 2003; Kasekamp, 2010; Piirimäe, 1997; Raun, 1991). O'Connor, *The History of the Baltic States*; Kasekamp, *A History of the Baltic States*; Piirimäe, *Return to the Western World*; Raun, *Estonia and the Estonians*.

³³ O'Connor, *The History of the Baltic States*; Kasekamp, *A History of the Baltic States*; Piirimäe, *Return to the Western World*; Raun, *Estonia and the Estonians*.



Military conflicts between Muscovy, Sweden, and Poland–Lithuania ensued, including the First Northern War (1558–83), the Second Northern War (1655–60), the Great Northern War (1700–21), and several bilateral conflicts. With the Peace of Altmark in 1629, South Livonia (the Vidzeme region in Latvia) became a part of the Swedish realm for around a century, with Riga becoming the largest city in the Swedish Empire. To explore the persistence of Swedish imperial influence in the territories of former South Livonia, we identify three main channels of persistence: the role of Lutheranism and the Lutheran Church in South Livonia, the impact of Baltic Germans, and land redistribution.

The Lutheran Church in South Livonia contributed to the literacy and education of the local population. A written Latvian language with German influence also emerged in South Livonia.³⁴ The promotion of the Latvian language by the Lutheran Church set the grounds for the economic self-determination of peasants against the South Livonian nobility.³⁵ The Church Law of 1686 (*Kyrkio-Lag och Ordning*), which was extended to Livonia (as well as Estland) in 1690, transformed literacy in the Baltic region. Parish priests were obliged to monitor the ability of Lutheran households to read the Bible and participate in catechism activities.³⁶ The organization of basic schooling at the village level was also part of the Church Law regulations.

The rise of Sweden as a military power in the Baltic region under Gustav II Adolph was conditioned by decentralization.³⁷ This observation is in accordance with the ability of Riga's local authorities to preserve their financial autonomy from the central government when they became part of the Swedish realm.³⁸ The logic of a conglomerate empire, where provinces were ruled according to their own traditions and political institutions, underscores the role of Baltic German elites and their autonomy in our understanding of the Swedish imperial rule and its political economy.³⁹ Affiliation with and knowledge of German language and culture was considered to be a strong signal of elevated socio-economic status, also amongst Latvian peasants, as corroborated by the dissemination of customs and dialectal loans.⁴⁰

Hence, the consolidation of the Swedish crown domestically reduced the economic influence of the nobility and led to the rise of a new bourgeoisie of civil servants and military officers who were recruited from the gentry and commoners.⁴¹ Furthermore, the evolution of state bargaining prevented the arbitrariness of local nobility and reinforced the legitimacy of the royal institution and the participation of commoners in their different capacities as soldiers, workers, or taxpayers.⁴² This reality provides a powerful foundation for the role of land redistribution under the policy of *Reduktion*, which transferred the ownership of South Livonian estates from

³⁴ Kasekamp, *A History of the Baltic States*; Oberlender, 'Concept of the Early Modern Era'; Piirimäe, *Return to the Western World*.

³⁵ Bruce, 'The Supply-Side Model of Religion: The Nordic and Baltic States'.

³⁶ Raun, 'Literacy in the Russian Empire in the late nineteenth century: The striking case of the Baltic provinces'.

³⁷ Peterson, *Warrior kings of Sweden: The rise of an empire in the sixteenth and seventeenth centuries*.

³⁸ Sandberg, 'The State and the Integration of the Towns of the Provinces of the Swedish Baltic Empire', Conference Paper, Riga (2001).

³⁹ Gustafsson, 'The Conglomerate State'; Burbank and Cooper, *Empires in World History*. Patterns of continuity between the medieval demesne system and Swedish imperial rule are also observed in the Baltic region (Pihlajamäki, 2017; Seppel, 2020).

⁴⁰ Alenius, 'Images of Neighbors'.

⁴¹ Gerner, 'Swedish and Polish-Lithuanian Empires'.

⁴² Hallenberg, Holm, and Johansson, 'Organization, Legitimation'; Kirby, *Northern Europe*.



the landlords to the crown.⁴³ Archival evidence on the policy of *Reduktion* of Charles XI can be found in Figure A.2. Heldring et al. also argue that the dissolution of English monasteries was associated with land redistribution and industrialization, as suggested by the 1838 mill census.⁴⁴ Hence, the imperial origins of socio-economic development in South Livonia may be intertwined with institutions of economic autonomy and relative political equality under Swedish rule.

At the same time, it is important also to consider the impact of the European enlightenment in the late eighteenth century and beyond and oftentimes against the Lutheran Church and its role in the Baltic school system, given that many primary schools remained in a dismal condition and the education the peasantry was far from having reached a satisfactory level.⁴⁵

Courland came under Polish–Lithuanian rule in 1561. An exception was the territory of the Bishopric of Courland, which was purchased by the Danish king in 1560 and remained in Danish ownership until 1585, when it was incorporated into the Polish–Lithuanian Commonwealth. Whilst South Livonia later became a part of the Swedish realm, the Duchy of Courland remained a part of the Polish–Lithuanian Commonwealth for more than 200 years (1561–1795). Polish–Lithuanian rule in Courland was formal, however, as the area was largely autonomous. The Polish–Lithuanian Commonwealth granted the right to practise Lutheranism and to use German language and law.⁴⁶ The dukes were appointed by the king of the Polish–Lithuanian Commonwealth and were given autonomy and hereditary rights, but their political power was limited. The German nobility maintained its rights, and German was the leading language in the region.⁴⁷ However, close ties with Polish–Lithuanian nobles (e.g. through marriage) promoted the spread of Catholicism in Courland.

The Duchy of Courland stagnated and did not experience any significant modernization due to constant political power disputes between the duke and the nobility.⁴⁸ The Duchy of Courland became a political satellite of Russia and was annexed by the Russian Empire in 1795.⁴⁹

Lettgallia became a part of the Polish–Lithuanian Commonwealth in 1562 when the local elite swore allegiance to the Polish–Lithuanian crown to counter Ivan the Terrible. Unlike Courland, Lettgallia (also called the Inflanty Voivodeship) was fully integrated into the Commonwealth and remained under Polish–Lithuanian influence for four centuries.⁵⁰ The nobility in Lettgallia was mixed, as it included Polish, Lithuanian, German, and Eastern Slavic landed nobility. The local population included Russian, Belarusian, Polish, and Jewish minorities and Polish was the language of the educated class. Moreover, a written language in Lettgallia was developed by Jesuit priests on the basis of Polish.⁵¹

⁴³ Gerner, 'Swedish and Polish-Lithuanian Empires'; Roberts, M., *The Swedish Imperial Experience, 1560–1718*.

⁴⁴ Heldring, Robinson, and Vollmer, 'Long-Run Impact of the Dissolution'.

⁴⁵ Pöldvee, 'Pedagogical Innovations and Estonian Education'.

⁴⁶ Kasekamp, *A History of the Baltic States*.

⁴⁷ Kamusella, 'Germanization, Polonization and Russification'.

⁴⁸ Oberlender, 'Concept of the Early Modern Era and the History of Estonia, Vidzeme and Kurzeme'.

⁴⁹ Kasekamp, *A History of the Baltic States*; Plakans, 'Peasants, Intellectuals and Nationalism'.

⁵⁰ Kasekamp, *A History of the Baltic States*.

⁵¹ Kasekamp, *A History of the Baltic States*; Ivanovs and Soms, 'Origins of Regional Identity'; Plakans, *A Concise History*; Jakobsons, 'The Rule of the Polish–Lithuanian Commonwealth'.



The dominant religion in Lettgallia was Catholicism. The reinforcement of local magnates at the expense of the peasantry did not contribute to the advancement of literacy and education.⁵² Urban development and economic activity in Polish Lettgallia were hampered not only by the successes of the Swedish Empire in Livonia, but also by the limited state capacity of its imperial administration.⁵³ Hence, socio-economic development was stalled by Polish–Lithuanian rule. The Polish–Lithuanian Commonwealth collapsed at the end of the eighteenth century, with Lettgallia becoming part of the Russian Empire as a result of the First Partition of the Polish–Lithuanian Commonwealth in 1772.⁵⁴

In 1561, North Livonia came under Polish–Lithuanian rule when the Master of the Livonian Order swore allegiance to the Polish king and the Lithuanian grand duke. An exception was Ösel-Wiek (Saaremaa), which was sold to the Danish king in 1559 and remained under Danish rule until 1645. Under Swedish tutelage, elementary schools were established in every parish and the foundation of a teachers' seminary and a university in Dorpat (Tartu) were the most prominent achievements. From the university's inauguration onward, the Lutheran influence in the university was prominent, as courses were offered both in Latvian and Estonian.⁵⁵ Furthermore, admission was open to peasants despite the negative reaction of Livonian nobility.⁵⁶ The literacy campaigns in the Swedish realm, with the support of the Lutheran Church, succeeded in the spread of printed religious texts that increased literacy through Bible reading and catechism at the parish level.⁵⁷ With the Treaty of Nystad (Uusikaupunki), North Livonia was incorporated into the Russian Empire, and the estates were run by German nobles, as Peter I provided vast privileges to Baltic Germans.⁵⁸ In the nineteenth century, Tartu was the city with the highest urban literacy rate in the Russian Empire.⁵⁹

After the collapse of the Livonian Confederation, the city of Reval (Tallinn) and the knights of North Estonia placed themselves under the protection of the Swedish king in 1561. Thus, Estland became a part of the Swedish realm for more than 150 years (1561–1721). Reval managed to keep its own Hanseatic legal and administrative system under Swedish rule.⁶⁰ Lutheranism was the dominant religion in the region after the Reformation. As in North and South Livonia, the dissemination of printed materials proselytizing in favour of the new faith contributed to the drastic elimination of illiteracy in Estland.⁶¹ The expansion of education with the support of the Lutheran Church contributed significantly to the development of a written Estonian language with German

⁵² Gerner, 'Swedish and Polish-Lithuanian Empires'.

⁵³ Ibid.

⁵⁴ Plakans, 'Peasants, Intellectuals and Nationalism'.

⁵⁵ Roberts, *The Swedish Imperial Experience, 1560–1718*.

⁵⁶ Ibid.

⁵⁷ Raun, 'Literacy in the Russian Empire in the Late nineteenth Century'.

⁵⁸ O'Connor, *The History of the Baltic States*; Kasekamp, *A History of the Baltic States*; Piirimäe, 'Historical Heritage'; Raun, *Estonia and the Estonians*.

⁵⁹ Ibid.

⁶⁰ Sandberg, 'The State and the Integration of the Towns of the Provinces of the Swedish Baltic Empire', Conference Paper, Riga (2001).

⁶¹ Raun, 'Literacy in the Russian Empire in the Late nineteenth Century'.



and Swedish influence.⁶² Estland was incorporated into the Russian Empire with the Treaty of Nystad (Uusikaupunki) in 1721.⁶³

At the end of the eighteenth century, all the territories of contemporary Latvia and Estonia were incorporated into the Russian Empire. From the reign of Catherine II (1762–96), the state began to force its interests actively and restrict the Baltic German nobility.⁶⁴ In the governorates of Courland, Livonia (including North and South Livonia), and Estland, German nobles retained their traditional rights. However, Baltic peasants were granted personal freedom, as serfdom was abolished in Estland in 1816, in Courland in 1817, and in Livonia in 1819. The Lutheran church played an important role in the development of education in the region.⁶⁵ Lutheranism remained the dominant religion and German the dominant language. In return, the German nobility vowed loyalty to Russian imperial rule. They often took high posts in the Russian administration, especially in the military and diplomatic corps.⁶⁶

A different situation occurred in Lettgallia, a former Polish–Lithuanian Commonwealth territory that was seized by the Russians and became part of the Vitebsk Governorate. As Poles and Lithuanians rebelled against Tsarist rule twice in the first half of the nineteenth century, the Russian government introduced harsh Russification measures, establishing the use of the Russian language and promoting conversion to Orthodoxy. In 1864, the use of the Latin alphabet was prohibited when writing in Lithuanian or Lettgallian. However, it was still possible to use the Latin alphabet for Polish texts. Serfdom was abolished in 1861, much later than in the rest of the Baltic territories.⁶⁷

Hence, the exogenous creation of four imperial regions (including the distinction between North and South Livonia) and two imperial zones (Sweden, Poland–Lithuania) facilitated fundamental differences in socio-economic development across the Swedish–Polish borders in contemporary Latvia.⁶⁸ Consequently, this placed the Baltic territories that belonged in their entirety to the Swedish Empire on a more advantageous socio-economic track. Whilst Lettgallia represents Polish–Lithuanian imperial rule in the pre-Nystad historical context, Estland as well as (North and South) Livonia provide differential evidence for the persistence of the Swedish imperial legacy. Courland is a complex case because, on the one hand, it was primarily Lutheran and independent until its inclusion into the Russian Empire in 1795, and on the other hand, it was a (nominal) province of the Polish–Lithuanian Commonwealth. We therefore provide the following hypotheses:

⁶² Kasekamp, *A History of the Baltic States*; Oberlender, ‘Concept of the Early Modern Era’; Piirimae, ‘Historical Heritage’.

⁶³ O’Connor, *The History of the Baltic States*; Kasekamp, *A History of the Baltic States*; Piirimae, *Historical Heritage*; Seppel, ‘Landlords’ Obligation’.

⁶⁴ Seppel, ‘Landlords’ Obligation’.

⁶⁵ During the Swedish period (seventeenth–eighteenth centuries), elementary schools were established for peasants and the first books (Lutheran religious texts) were published in Estonian and Latvian (Piirimae, 1997). These educational efforts led to high literacy rates in the Lutheran regions, reaching 92% in Latvia and 96% in Estonia in 1897, whereas in Catholic Lettgallia, a former territory of the Polish–Lithuanian Commonwealth, the literacy rate was only 58% (Kasekamp, 2010). Moreover, amongst Baltic German pastors and tutors were to be found the first critics of serfdom, helping to spread the ideas of Enlightenment in the Baltic region, as well as the first promoters of local cultures, thus preparing the grounds for the national awakening in the second half of the nineteenth century (Raun, 1999).

⁶⁶ Plakans, ‘Peasants, Intellectuals and Nationalism’; Kasekamp, *History of the Baltic States*.

⁶⁷ O’Connor, *The History of the Baltic States*; Kasekamp, *A History of the Baltic States*; Kamusella, ‘Germanization, Polonization and Russification’.

⁶⁸ Comparing new and old borders between figs. 1 and 2 indicates that the new borders were exogenously defined as a result of military conflict rather than as an endogenous choice of local elites.



Hypothesis 1. *Swedish partitions in the Baltics (South Livonia) exhibit higher levels of socio-economic development than Polish–Lithuanian partitions (Courland, Lettgallia).*

Hypothesis 2. *Higher shares of Lutherans, Germans, and peasant landowners in the Swedish partition of South Livonia predict higher levels of contemporary socio-economic development than is the case in the Polish–Lithuanian partitions of Courland and Lettgallia.*

III | DATA AND EMPIRICAL STRATEGY

We use four main types of data: state data (including census) and data from official registries, as well as survey, geographical, and historical data. We use the most detailed level of data available: sub-municipal data for Latvia before the municipal reform in 2021 (587 units) and municipal data for Estonia according to the division before the municipal reform in 2017 (213 units).⁶⁹

State data and data from official registries: The data for Estonia on population, income, higher education level, and nationality at the municipal level (according to the division before the municipal reform in 2017) come from the official website of Statistics of Estonia. For Latvia we use specially requested 2000 and 2011 census data from the Central Statistical Bureau Latvia to measure education level and nationality at the sub-municipal level. The data on population and income at the sub-municipal level in Latvia come from the Latvian regional development indicators module RAIM.

Survey data: We use individual-level responses from the Life-in-Transition Survey III (LiTS III) to construct measures of values and attitudes. The LiTS III is a household and attitudinal survey conducted in 34 countries between 2015 and 2016. It is also the only nationally representative survey with publicly available geocoded information. The survey includes more than 1400 households in 48 sample points in Latvia and 42 sample points in Estonia (Figure A.3). We use responses to several questions of the survey to measure such values as obedience to law, respect for authorities and trust in central government, and attitudes towards market economy. The localization of respondents is available at a sub-municipal level. We use individual-level data and also aggregate these measures to the level of districts of the Russian Empire in 1897. The data of 41 out of 58 districts are available in this survey.

Geographical data: We use a historical map of the governorates of Livonia, Estland, and Courland produced in Riga in 1904 from the Digital Collection of the National Library of Latvia to create digital maps of the historical regions in the territory of contemporary Latvia and Estonia (Figure A.4).

Historical data: We collect quantitative information on the shares of Germans and primary education graduates, as well as Lutherans, from the 1897 census of the Russian Empire. We also use the share of Germans the 1935 census of independent Latvia. We add the share of landowners who were peasants from the imperial Russian agricultural censuses of 1878/1885 and 1905 as well as the size of land used by peasant communes from the 1905 land census of the Russian Empire.

⁶⁹ In Latvia, there are 118 municipalities, the borders of which do not match the Swedish–Polish historical border, that is, several municipalities were on both sides of the border. This is why we have introduced sub-municipal data and 587 units. Sub-municipal units include both towns and rural areas (parishes). For example, Kuldīga municipality includes Kuldīga town and eight parishes around it, altogether nine sub-municipal units. Riga and other cities or towns constitute single units, as data on city quarters are not available in Latvian statistics. See also the district-level panel estimations in Markevich and Zhuravskaya (2018).

Furthermore, we include quantitative information on the land owned by nobles from the 1905 land census of the Russian Empire and on the share of serfs in 1858 from the Buggle and Nafziger (2021) study. To match historical census data with contemporary data, we assign a historical district to each county, even when the size of the historical district is greater than the size of the respective modern county.

Table A.3 summarizes the data profile, that is, the basic information with respect to variables, units of measurement and data sources. Descriptive statistics are reported in Table A.4.

After the collapse of the Livonian Confederation, the Baltic regions experienced different cultural–historical treatment under Polish–Lithuanian and Swedish imperial rule, and after the Great Northern War, under the Russian Empire. This allows us to use quasi-experimental methods to identify differences in communities that were divided by a political border. We focus on the following two Swedish–Polish borders within contemporary Latvia: Courland/South Livonia and Lettgallia/South Livonia. The Swedish–Swedish border (Estland/North Livonia) within contemporary Estonia is used as a robustness check for our first hypothesis. To estimate whether affiliation with the historical regions of South Livonia, Courland, and Lettgallia has a lasting effect on socio-economic development, personal values, and political and religious preferences, we use a one-dimensional regression discontinuity model:⁷⁰

$$\text{Outcome}_i = \alpha_1 \text{Region}_i + \delta_1 \text{Distance}_i + \delta_2 \text{Region}_i \text{Distance}_i + \delta_3 E_i + \delta_4 X_i + \varepsilon_i$$

where i denotes sub-municipal unit/municipality. *Outcome* indicates a contemporary outcome variable from state or survey data. *Region* is a dummy indicating whether the unit belongs to Courland/Lettgallia, depending on the particular data sample, with South Livonia always being the comparison group. *Distance* is the distance from the centre of the territorial unit to the border, which is the forcing variable in our model. The interaction term *Region*Distance* indicates that the distance of each territorial unit to the border varies with its historical affiliation with one of the three former imperial regions. We use a sample of territorial units located within the immediate proximity of the border (100 km on both sides of the historical borders) as a cut-off point, thus ensuring that the territories are similar in terms of climate conditions, natural resources, infrastructure, and economic opportunities. This allows for a substantive justification of the proposed methodology, as it includes comparable populations and local economies across the former imperial border. E denotes the set of tested transmission channels, that is, share of Lutherans (1897), share of Germans (1897 and 1935), human capital (1897), and landownership concentration (1878/1885). X denotes the set of baseline variables such as large city and capital agglomeration dummies, and ε is an error term.

Our sample from the Life-in-Transition Survey III covers 1036 individuals in the case of the South Livonia–Courland border and 619 individuals in the case of the South Livonia–Lettgallia border. Socio-economic development indicators are also available at the level of municipalities in Estonia and sub-municipalities in Latvia. This allows us to compare 73 territorial units around the South Livonia–Courland border and 63 territorial units around the South Livonia–Lettgallia border. Drawing on evidence from state data, we proxy socio-economic development with the share of higher education, the logarithm of income (average wage), and the unemployment rate. LiTS III data, that is, preferences for law obedience, market economy, and trust towards religious

⁷⁰ For a detailed discussion in both a theoretical and an applied context of RDD, see Angrist and Pischke (2009), Grosfeld and Zhuravskaya (2015), and Lee and Lemieux (2010).



institutions, relate to the standard role of law enforcement, capitalism, and identity, respectively, and therefore socio-economic development.

Furthermore, we implement the robust regression discontinuity method introduced by [Calonico et al.](#) The key assumption underpinning its causal interpretation is that the political borders that emerged in the Baltics in the aftermath of the collapse of the Livonian Confederation were exogenously defined.⁷¹ The Truce of Altmark (1629) ended the Swedish–Polish military confrontation with the mediation of the French, English, and Dutch governments.⁷² The Altmark borders placed Courland southwest of the Düna River (Daugava in Latvian) and in this way separated it from Livonia. Similarly, the Düna River separated Courland from Lettgallia. The South Livonia–Lettgallia border is defined by the Awex River (Aiviekste in Latvian). Hence, the Swedish–Polish imperial borders in the Baltics follow obvious geographical patterns that justify the exogeneity assumption. At the same time, the North Livonia–Estland border is defined by mountains. We apply McCrary RD density tests (Figure A.5) and RD density manipulation testing (Figure A.6).⁷³ For state data, the RD density manipulation test statistics for the South Livonia–Courland and the South Livonia–Lettgallia (robust *t*-statistic of -0.228 with a *p*-value of 0.819 and robust *t*-statistic of 1.128 with a *p*-value of 0.259, respectively) do not reject the null hypothesis of no manipulation of the running variable.⁷⁴ Similarly, for LiTS III data, the RD density manipulation test for the South Livonia–Courland and the South Livonia–Lettgallia borders does not provide evidence of the systematic manipulation of the forcing variable (robust *t*-statistic of 0.483 with a *p*-value of 0.629 and robust *t*-statistic of -0.992 with a *p*-value of 0.321, respectively).

[Bugle and Nafziger](#) underscore the persistent effects of serfdom on Russia's contemporary welfare by providing mechanisms such as lower urban agglomeration and slower industrial development.⁷⁵ Nevertheless, our study focuses on the comparative legacies of the Swedish and Polish–Lithuanian empires rather than on the subsequent Russian imperial legacy for the following reasons. First, when it comes to serfdom, South Livonia and Courland abolished serfdom with a difference of only 2 years with Courland (former Polish–Lithuanian partition) moving ahead of South Livonia (former Swedish partition) (1817 in Courland and 1819 in South Livonia, see Table A.2 in the Appendix). With respect to the South Livonia–Lettgallia border, there is a time difference in the abolition of serfdom (1861 in Lettgallia and 1819 in South Livonia), which could be considered significant, however, Lettgallia has had a different demographic profile and been exposed to a different set of other policies by Russia's imperial government (see Table A.2 in the Appendix on Russification). Thus, the earlier conquest of the Swedish partitions in the Baltics by Russia appears not to matter either. The inclusion of the landownership census data from 1878/1885 and 1905 as potential mediating channels (of imperial Russia) considers the impact of local policies and their variation on long-run Baltic development. However, it treats Russian imperial policies in the region as a continuation of the critical junctures imposed by its two predecessor empires: Sweden and Poland–Lithuania.

⁷¹ [Calonico et al.](#) 'Robust Data-Driven Inference' (2014a); 'Optimal Data-Driven Regression Discontinuity Plots' (2015); 'Rdrobust: Software for Regression Discontinuity Designs' (2017).

⁷² [Fedorowicz](#), 'Anglo-Polish Commercial Relations'. Modern historiography extensively discusses the drawing of the Swedish–Polish borders in the Baltics in the seventeenth century ([Westergaard](#), 1944; [Roberts](#), 1979).

⁷³ [McCrary](#), 'Manipulation of the Running Variable'. [Cattaneo et al.](#), 'Manipulation testing based on density discontinuity'

⁷⁴ *Ibid.*

⁷⁵ [Bugle and Nafziger](#), 'The Slow Road from Serfdom'.



There are two borders to be tested: the South Livonia–Courland border and the South Livonia–Lettgallia border. Due to a highly limited set of observations in the LiTS III, the short Lettgallia–Courland border is excluded from the analysis. To be able to estimate the discontinuous jump across the borders for our outcome variables, we select a bandwidth of 100 km on both sides of the border (see also Grosfeld and Zhuravskaya, 2015).⁷⁶ The assumption is that if differences in prior imperial rule do not exist, no discontinuous jump will be observed.⁷⁷

IV | RESULTS

We perform a baseline ordinary least squares (OLS) estimation for the two historical Swedish–Polish borders in the Baltics within the territory of contemporary Latvia (Table A.5 and Figure A.7) by introducing a border dummy that captures the difference between the Swedish partition of South Livonia, on the one hand, and the Polish–Lithuanian partition of Courland or Lettgallia, on the other hand. We observe that South Livonia scores higher in the South Livonia–Courland border when it comes to higher education, income, and preferences for law obedience and market economy. Moreover, South Livonia exhibits higher levels of higher education and income, lower levels of unemployment, and strong preferences for law obedience and market economy across the South Livonia–Lettgallia border. Nevertheless, given significant endogeneity concerns regarding the OLS method, we proceed with the implementation of robust RD estimations across the Swedish and Polish–Lithuanian partitions in the Baltics.

As Table 2 and Figure 3 indicate, the former Swedish–Polish border between South Livonia and Courland produces significant differences in levels of socio-economic development, which corroborates hypothesis 1.⁷⁸ In both panel A, where we test the significance of the border without any covariates, and panel B, where we introduce baseline covariates such as city and capital agglomeration dummies, higher education shares and income levels are significantly higher in South Livonia than in Courland. Furthermore, unemployment rates are significantly lower in the Swedish partition of South Livonia than in the Polish–Lithuanian partition of Courland. Moreover, the historical border between South Livonia and Courland also seems to persist when it comes to preferences for law obedience, market economy, and trust in religious institutions. The latter outcome underscores the logic of religious identity, which is central to economic performance, institutional preferences, and social capital.

⁷⁶To report our results, we implement econometric refinements to the standard (conventional) regression discontinuity (RD) design proposed by Calonico et al. (2014a, 2014b, 2015, 2017), Calonico et al. (2018), and Calonico et al. (2019). In addition to the conventional RD estimates with a conventional variance estimator, we also report bias-corrected RD estimates with both conventional and robust variance estimators (Calonico et al., 2017). The main difference between a bias-corrected and a robust CI is the efficiency of the variance estimator related to the optimal bandwidth of the RD estimate; a robust variance estimator is more efficient than a conventional variance estimator (ibid.; Calonico et al., 2018). This set of refinements (bias-corrected and robust CI) increases the validity of our results by providing a more accurate analytical framework for the computation of historical border effects in the Baltics.

⁷⁷Both confidence intervals and RD point estimates differ between the conventional and the bias-corrected/robust methods. Under the conventional method, we compute conventional RD estimates with a conventional variance estimator; under the bias-corrected and robust methods, we compute bias-corrected RD estimates with both a conventional and a robust variance estimator (Calonico et al., 2014a). Hence, robustness refers to the efficiency of the variance estimator used to compute the robust confidence intervals of bias-corrected RD point estimates.

⁷⁸Because South Livonia borders both with Courland and Lettgallia, to capture cleavages across the Swedish–Polish border in its entirety, we perform robust regression discontinuity estimations with the regional pairs South Livonia–Courland and South Livonia–Lettgallia. South Livonia is the reference region in both cases.

**TABLE 2** RD results with robust bias-corrected CIs: South Livonia versus Courland (1629 borders).

Outcomes						
Panel A: no covariates	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	-0.084 [0.023]***	-0.221 [0.073]***	0.005 [0.004]	-1.731 [0.372]***	-0.123 [0.110]	-0.364 [0.196]*
Bias-corrected	-0.059 [0.023]***	-0.181 [0.073]***	0.008 [0.004]*	-2.011 [0.372]***	-0.262 [0.110]**	-1.261 [0.196]***
Robust	-0.059 [0.0274]***	-0.181 [0.091]***	0.008 [0.006]	-2.011 [0.830]***	-0.262 [0.229]	-1.261 [0.378]***
Observations	106	106	106	1610	1533	1347
Panel B: baseline covariates	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	-0.052 [0.018]***	-0.118 [0.050]**	0.000 [0.003]	-1.512 [0.372]***	-0.107 [0.110]	-0.345 [0.196]*
Bias-corrected	-0.037 [0.018]**	-0.113 [0.050]**	0.005 [0.003]*	-2.151 [0.372]***	-0.244 [0.110]**	-1.096 [0.196]***
Robust	-0.037 [0.022]	-0.113 [0.053]**	0.005 [0.003]	-2.151 [0.830]***	-0.244 [0.229]	-1.096 [0.378]***
Observations	106	106	106	1610	1533	1347

Notes: Significance levels:

Sources: Table 1 Imperial rule in the Baltics and Table A.3 Data profiles and sources.

*** $p < 0.01$,

** $p < 0.05$,

* $p < 0.1$. Standard errors are in brackets. All regressions include a linear polynomial in distance and use 100 km bandwidth. Distance to the South Livonian side of the border is multiplied by -1 , whereas distance to the Courland side of the border is multiplied by 1 . For our estimations, we take the logarithm of the monthly average income level. Baseline covariates include large city and capital city agglomeration dummies.

In panel A of Table 2, South Livonian territories appear to be significantly wealthier than Courland territories by an average difference of -18.1 log points at the 5 per cent level. Higher education (state data) appears to be significantly higher in former South Livonian than in former Courland territories by a mean difference of -5.9 percentage points, which is statistically significant at the 5 per cent level with both bias-corrected and robust CIs. At the same time, unemployment is significantly higher in the former Polish–Lithuanian partition than in the former Swedish partition of the border by an average difference of 0.8 percentage points, which is statistically significant at the 10 per cent level with a bias-corrected confidence interval (CI). The magnitude and high statistical significance of the average difference in preference for law obedience (-2.011 scale points and statistically significant at the 1 per cent level) suggests that respondents in former South Livonia are strong supporters of the rule of law and property rights protection. Preferences for market economy are also significantly higher in the former Swedish partition by a mean difference of -0.262 scale points, which is statistically significant at the 5 per cent level with a bias-corrected CI. Trust in religious institutions as a proxy for identity and social capital is also significantly

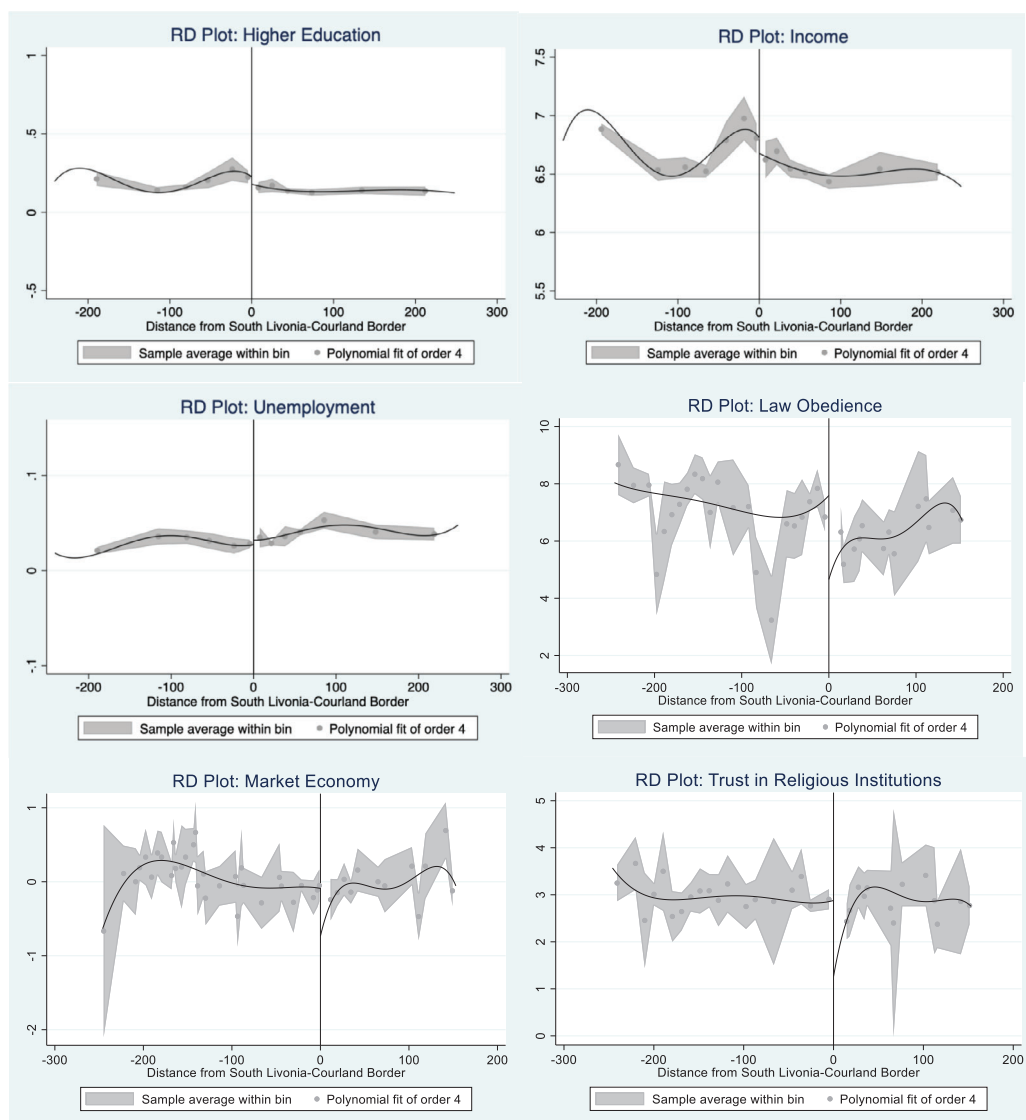


FIGURE 3 RD plots with conventional CIs: South Livonia versus Courland (1629 borders). *Note:* The figures refer to panel A (no covariates) of Table 2. Mimicking-variance regression discontinuity plots with binned sample means and quantile-spaced partitioning (sample averages within bin, see Calonico et al. (2015)). Regression discontinuity parameters for each of the selected outcome variables are computed with conventional 95% confidence intervals. The horizontal axis denotes the distance from the South Livonia–Courland border and the vertical axis shows the magnitude of the respective outcome variable.

higher amongst South Livonian respondents by a mean difference of -1.261 scale points at the 1 per cent level. Panel B of Table 2 corroborates the results reported in panel A.

Table 3 and Figure 4 report and graph the results of a robust regression discontinuity design across the South Livonia–Lettgallia border. We perform our estimations with no covariates and with the baseline covariates in panels A and B of Table 3, respectively. We found that income

**TABLE 3** RD results with robust bias-corrected CIs: South Livonia versus Lettgallia (1629 borders).

Outcomes						
<u>Panel A: no covariates</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	−0.016 [0.016]	−0.126 [0.053]**	0.025 [0.012]**	−0.529 [0.664]	0.010 [0.190]	−0.941 [0.351]***
Bias-corrected	−0.022 [0.016]	−0.175 [0.053]***	0.011 [0.012]	−6.286 [0.664]***	−0.964 [0.190]***	−3.369 [0.351]***
Robust	−0.022 [0.026]	−0.175 [0.075]**	0.011 [0.017]	−6.286 [2.057]***	−0.964 [0.673]	−3.369 [1.214]***
Observations	85	85	85	1416	1351	1211
<u>Panel B: baseline covariates</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	−0.019 [0.016]	−0.139 [0.056]**	0.025 [0.012]**	−0.185 [0.664]	−0.035 [0.190]	−0.920 [0.351]***
Bias-corrected	−0.030 [0.016]*	−0.208 [0.056]***	0.011 [0.012]	−6.823 [0.664]***	−0.877 [0.190]***	−3.403 [0.351]***
Robust	−0.030 [0.024]	−0.208 [0.067]***	0.011 [0.017]	−6.823 [2.057]***	−0.877 [0.673]	−3.403 [1.214]***
Observations	85	85	85	1416	1351	1211

Notes: Significance levels:

Sources: Table 1 Imperial rule in the Baltics and Table A.3 Data profiles and sources.

*** $p < 0.01$,

** $p < 0.05$,

* $p < 0.1$. Standard errors are in brackets. All regressions include a linear polynomial in distance and use 100 km bandwidth. Distance to the South Livonian side of the border is multiplied by -1 , whereas distance to the Lettgallian side of the border is multiplied by 1 . For our estimations, we take the logarithm of the monthly average income level. Baseline covariates include large city and capital city agglomeration dummies.

and a preference for law obedience and market economy as well as trust in religious institutions are significantly higher in former South Livonia than in former Lettgallia. South Livonian lands were inclined to be significantly richer than Courland lands by a mean difference of -17.5 log points at the 5 per cent level (robust CI; panel A of Table 3). Preference for law obedience appears to be significantly higher in former South Livonia than in former Lettgallia by a mean difference of -6.286 scale points at the 1 per cent level (panel A of Table 3). Preference for market economy produces statistically significant differences across the South Livonia–Lettgallia border as well – the mean difference is -0.963 scale points and it is statistically significant at the 1 per cent level (panel A of Table 3). Trust in religious institutions also produces higher scores in the Swedish partition of South Livonia than in the Polish–Lithuanian partition of Lettgallia by an average difference of -3.369 scale points, which is statistically significant at the 1 per cent level with both bias-corrected and robust CIs. Panel B of Table 3 confirms the results reported in panel A. Hence, our first hypothesis is also verified for the South Livonia–Lettgallia border.

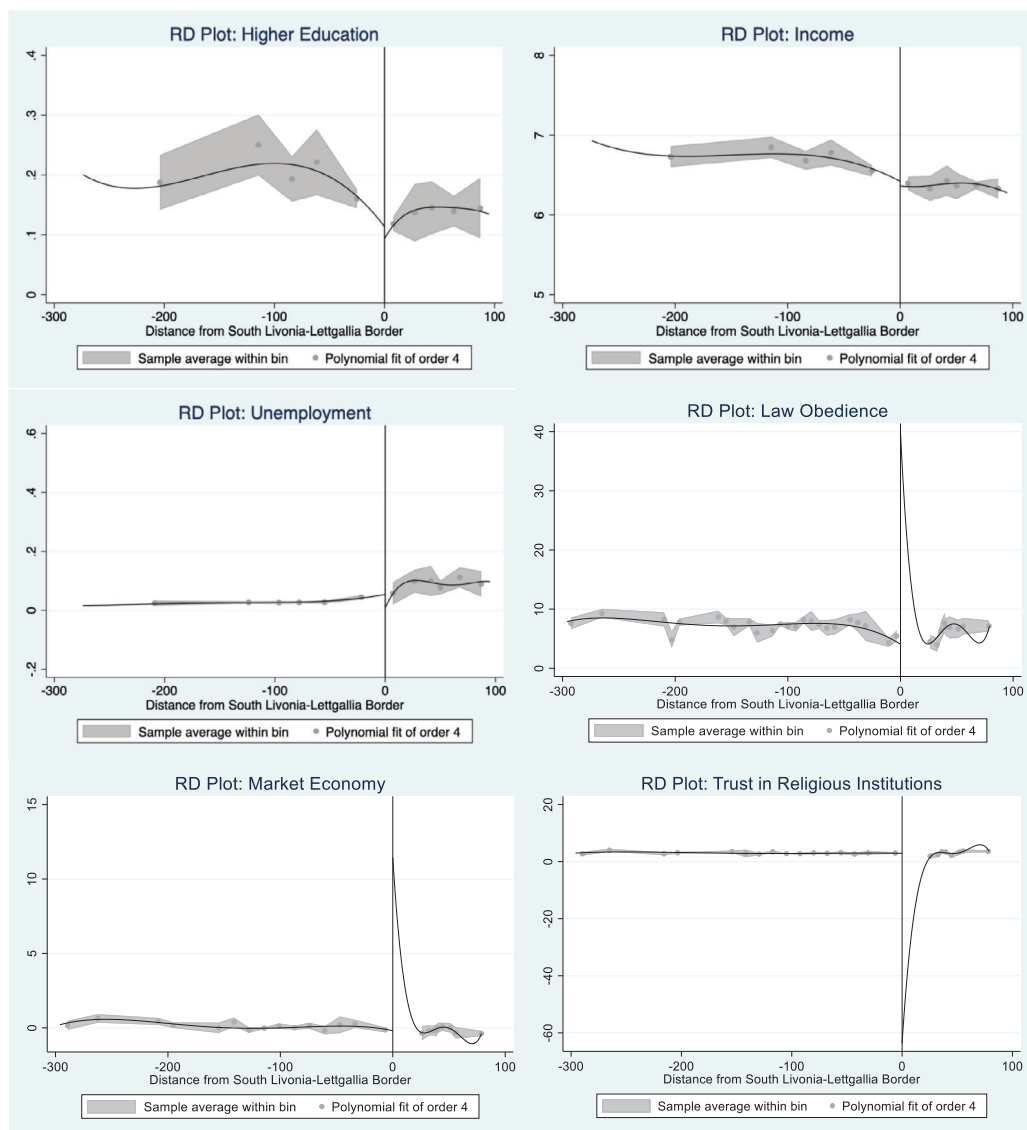


FIGURE 4 RD plots with conventional CIs: South Livonia versus Lettgallia (1629 borders). *Note:* The figures refer to panel A (no covariates) of Table 3. Mimicking-variance regression discontinuity plots with binned sample means and quantile-spaced partitioning (sample averages within bin, see Calonico et al. (2015)). Regression discontinuity parameters for each of the selected outcome variables are computed with conventional 95% confidence intervals. The horizontal axis denotes the distance from the South Livonia–Lettgallia border and the vertical axis shows the magnitude of the respective outcome variable.

The South Livonia–Courland appears to be persistent across a larger set of socio-economic outcomes compared with the South Livonia–Lettgallia border. This is due to massive population replacements that took place in Lettgallia throughout the nineteenth and twentieth centuries, which altered the demographic profile of the region. Whilst the predominance of Roman Catholicism has not changed since the seventeenth century, the migration of ethnic Russians and policies of Russification (see Table A.2 in the Appendix) as well as the Holocaust, which



deprived the region of its sizeable Jewish population, may have weakened the possibility of inter-generational transmission. In addition, Courland remained institutionally and culturally more similar to South Livonia and Estland compared with Lettgallia during the Russian Empire despite its lower levels of modernization (see Table A.2 in the Appendix). The continuation of this institutional and cultural proximity of Courland to the Swedish partitions of South Livonia and Estland provides a strong intuitive and historically informed basis for the comparison of the two Swedish–Polish borders. Moreover, there is no major natural boundary at the border between South Livonia and Lettgallia, whereas in the case of the South Livonia–Courland border the river Daugava sets a clear mark between the two former imperial regions. This environmental reality corroborates our interpretation of massive population transfers and conflict as the main driver of the persistence differences between the two borders.

V | ROBUSTNESS CHECKS

In regard to the Swedish–Swedish border (placebo), both North Livonia and Estland were under the influence of Swedish imperial rule. The North Livonia–Estland border does not reveal any robustly persistent differences in the direction of either North Livonia or Estland (see Table A.6 and Figure A.8). The temporally limited status of North Livonia as a vassal of the Polish–Lithuanian Commonwealth (1561–1629) did not produce any Polish–Lithuanian institutional impact, and thus offers no potential for any long-run socio-economic differences between Estland and North Livonia. Whilst North Livonia exhibits higher levels of income and lower levels of unemployment, Estland performs better in trust in religious institutions. Thus, it is not possible to draw any conclusions about border persistence in this Swedish–Swedish (placebo) border (1629).

Grosfeld *et al.* have identified the persistence of anti-Semitism in the form of anti-market practices in regions that constituted the Pale of Settlement, the territorial zone of legal Jewish residence under the auspices of the Russian Empire, from 1791 to the Russian Revolution.⁷⁹ Lettgallia (already part of the Russian Empire since 1772) had been included in the Pale of Settlement since 1791. By exploring the statistical significance of the 1772/1791 border, we intend to show whether it is the Jewish presence rather than the Swedish imperial legacy that drives higher levels of socio-economic development in contemporary Latvia and Estonia. As table A.7 and figure A.9 suggest, income levels and higher education shares are statistically significantly higher outside than inside Lettgallia, the former Pale territory in Latvia, with average differences of -17 log points and -2.2 percentage points, respectively (panel B of table A.7), which are statistically significant at the 5 and 1 per cent levels, respectively. Unemployment is also significantly higher inside rather than outside the Pale at the 1 per cent level. Rather than identifying a positive Pale effect related to the century-long Jewish presence in the Baltic region, our results corroborate the Grosfeld *et al.* findings regarding the persistence of anti-market values in the former lands of the Pale of Settlement.⁸⁰ Therefore, the Swedish–Polish imperial cleavage appears to hold as a key explanatory pattern for current socio-economic differences in the Baltics.

In Tables A.8 and A.9, following Kelly's argument on the possibility of spatial autocorrelation between different regional units in persistence studies, we report spatial autoregressive (SAR)

⁷⁹ Grosfeld *et al.*, 'Persistent Anti-Market Culture'.

⁸⁰ Grosfeld *et al.*, 'Persistent Anti-Market Culture'.



estimation results.⁸¹ In this way, we control for spatial dependence in our data, given the assumption that administrative districts further apart from each have a non-zero decreasing mutual influence. Our results are robust to several estimations with different combinations of spatial lags using generalized spatial two-stage least squares. The South Livonia–Courland border is conducive to higher levels of income and higher education shares in the former Swedish zone than in the former Polish–Lithuanian zone across the border (direct effects). Similarly, the South Livonia–Lettgallia border predicts higher levels of income and higher education shares in the former imperial region of South Livonia, which was under Swedish control, than in the imperial region of Lettgallia, which was under Polish–Lithuanian control (total and direct effects).

As presented in table A.10 in the Appendix, we performed RD estimations on placebo outcomes, that is, that are not related to empire-induced patterns of socio-economic development. For this purpose, we have selected gender stereotypes, predisposition towards climate change, and the number of children, seniors, and disabled in the household (see Table A.3 for substantive interpretation purposes). We find that across the South Livonia–Courland border, gender stereotypes and preference for climate change exhibit no significant differences in both panels A (no covariates) and B (baseline covariates). The size of the household (number of children, seniors, and disabled) is significantly higher in the Swedish partition of South Livonia (panel A) and in the Polish–Lithuanian partition of Courland (panel B), therefore, we cannot draw any conclusions from the evidence.

Across the South Livonia–Lettgallia border, preference for climate change exhibits no statistical significance in both panels A and B. Gender stereotypes and the size of household exhibit high levels of statistical significance, but in opposite directions: gender stereotypes are higher in the territories of former South Livonia, whereas the size of household is higher in the territories of former Lettgallia. Therefore, it is not possible to draw any conclusions on the persistent effects of empires with the selected placebo outcomes.

In Tables A.11 and A.12, we introduce a quadratic polynomial of distance for the South Livonia–Courland and the South Livonia–Lettgallia borders. Table A.11 reports RD results with no covariates (panel A) and with baseline covariates such as city and capital agglomeration dummies (panel B). Income, higher education shares and preferences for law obedience and market economy, as well as trust in religious institutions, are significantly higher in former South Livonia than in former Courland. Table A.12 in the appendix also suggests that income, higher education shares, and preferences for law obedience and market economy, as well as trust in religious institutions, are significantly higher in the Swedish partition of South Livonia than in the former Polish–Lithuanian partition of Lettgallia.

We introduce different bandwidths of 50 km (panel A) and 150 km (panel B) for both the South Livonia–Courland and the South Livonia–Lettgallia borders (Tables A.13 and A.14). In panel B of table A.13, higher education shares and income levels are significantly higher in South Livonia than in Courland by average differences of -7.1 percentage points and -18.9 log points, respectively, which are statistically significant at the 1 per cent level with both bias-corrected and robust Cis. These results are robust to the change of bandwidth from 150 to 50 km (panel A). Moreover, preferences for law obedience and market economy as well as trust in religious institutions remain significantly stronger in South Livonia than in Courland with both bandwidths. Income, a pref-

⁸¹ The origins of Conley and Kelly's (2025) argument are to be found in Conley (1999). Colella et al. (2019) criticize the efficiency of Kelly's (2019) approach by arguing that the spatial correlation of residuals may not prevent the observation of inflated values in t -statistics. Kelly, M., 'The Standard Errors of Persistence', *Working Paper* (2019).



erence for law obedience, and trust in religious institutions are also significantly higher in the Swedish partition of South Livonia than in the Polish–Lithuanian partition of Lettgallia (panel B of Table A.14). These results are also robust to the change of bandwidth from 150 km to 50 km (panel A). Hence, hypothesis 1 holds.

VI | MECHANISMS

The dominant position of the Lutheran Church under Swedish imperial rule and its significant role in the spreading of education in Livonia may explain the selection of the share of Lutherans in the Russian imperial census of 1897 as a possible transmission channel of Swedish imperial legacy into contemporary socio-economic development in the Baltics. The inclusion of the Lutheran share of 1897 in our subnational RD estimations leads to the disappearance of the South Livonia–Courland border when it comes to unemployment (panel A of Table 4). This observation could corroborate hypothesis 2 with respect to the long-run positive effect of Lutheranism on Baltic socio-economic development. Higher literacy levels and stronger individualist values amongst Lutherans are anticipated to have produced lower unemployment rates on the South Livonian rather than the Courland side of the former imperial border. However, the Lutheran impact seems not to be relevant for the South Livonia–Lettgallia border. This difference in observations between the two former Swedish–Polish borders may be related to the educational role of the Catholic Church in Lettgallia and the impact of Polish as a language of the educated middle class.

We utilize the Baltic German share reported in the Russian Empire census of 1897 and the independent Latvia census of 1935 as potential mechanisms for the transmission of the positive impact of the Swedish imperial legacy on contemporary socio-economic outcomes in the Baltic region. Drawing on evidence from RD estimations in panels B and C of Table 4 on the South Livonia–Courland border, we find that the 1935 German share switches off the South Livonia–Courland border when the outcome variables higher education shares and income (panel C of Table 4) and the average difference coefficients were computed with robust confidence intervals (CIs). The 1897 share of Germans led to the disappearance of the South Livonia–Courland border impact for higher education shares when the respective average difference coefficient was estimated with a robust CI. At the same time, the Baltic German share of 1935 may explain patterns of imperial persistence in the South Livonia–Lettgallia border when it came to income (panel C of Table 5). The economic and institutional autonomy of Baltic German elites under the Swedish crown, which set a powerful precedent for their socio-economic status under successive state structures, may show why we observe higher levels of socio-economic development in South Livonia, the intellectual and economic centre of Baltic German nobility, than in Courland. This finding could also support hypothesis 2.

The Russian Empire preserved the Baltic German autonomy that was facilitated by Swedish imperial rule. The German presence in Russia's Baltic territories has been connected to increased levels of human capital and landownership concentration. Courland and Livonia had the highest shares of Baltic Germans in the 1897 imperial Russian census followed by Estland, whilst Lettgallia scored the lowest in that regard. This ranking was visible also in the 1935 census of independent Latvia (that covered South Livonia, Courland, and Lettgallia), and the 1934 census of independent Estonia (that covered North Livonia and Estland). After World War I the overall number of Baltic Germans had already started to decrease. The very limited presence of Baltic Germans in Lettgallia may elucidate why the German share is likely to constitute a stronger potential persistence mechanism for the South Livonia–Courland border than for the South Livonia–Lettgallia border.



TABLE 4 Covariate-adjusted RD results with robust bias-corrected CIs: South Livonia versus Courland (1629 borders)—Mechanisms.

Outcomes						
<u>Panel A:</u> <u>Lutheranism</u> <u>(1897)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	−0.053 [0.017]***	−0.119 [0.048]**	0.000 [0.003]	−1.543 [0.372]***	−0.056 [0.110]	−0.294 [0.196]
Bias-corrected	−0.043 [0.017]**	−0.125 [0.048]***	0.004 [0.003]	−2.180 [0.372]***	−0.189 [0.110]*	−1.045 [0.196]***
Robust	−0.043 [0.019]**	−0.125*** [0.051]	0.004 [0.003]	−2.180 [0.830]***	−0.189 [0.229]	−1.045 [0.378]***
Observations	106	106	106	1610	1533	1347
<u>Panel B:</u> <u>Germans (1897)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	−0.049 [0.016]***	−0.110 [0.045]***	0.000 [0.003]	−1.449 [0.372]***	−0.112 [0.110]	−0.370 [0.196]
Bias-corrected	−0.038 [0.016]**	−0.115 [0.045]**	0.005 [0.003]**	−2.141 [0.372]***	−0.246 [0.110]**	−1.105 [0.196]***
Robust	−0.038 [0.020]	−0.115 [0.049]**	0.005 [0.003]	−2.141 [0.830]**	−0.246 [0.229]	−1.105 [0.378]***
Observations	106	106	106	1610	1533	1347
<u>Panel C:</u> <u>Germans (1935)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	−0.038 [0.017]**	−0.092 [0.047]*	−0.002 [0.002]	−1.586 [0.372]***	−0.080 [0.110]	−0.362 [0.196]*
Bias-corrected	−0.030 [0.017]*	−0.100 [0.047]**	0.004 [0.002]*	−2.094 [0.372]***	−0.269 [0.110]**	−1.082 [0.196]***
Robust	−0.030 [0.023]	−0.100 [0.053]	0.004 [0.003]	−2.094 [0.830]***	−0.269 [0.229]	−1.082 [0.377]***
Observations	106	106	106	1610	1533	1347
<u>Panel D:</u> <u>Human capital</u> <u>(1897)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	−0.055 [0.018]***	−0.124 [0.049]**	−0.000 [0.003]	−1.517 [0.372]***	−0.072 [0.110]	−0.290 [0.196]
Bias-corrected	−0.044 [0.018]**	−0.129 [0.049]***	0.004 [0.003]	−2.157 [0.372]***	−0.200 [0.110]*	−1.033 [0.196]***
Robust	−0.044 [0.020]**	−0.129 [0.051]**	0.004 [0.003]	−2.157 [0.830]***	−0.200 [0.229]	−1.033 [0.378]***
Observations	106	106	106	1594	1533	1347

(Continues)



TABLE 4 (Continued)

Outcomes						
<u>Panel E:</u> <u>Landowners</u> <u>(1878/1885)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	-0.028 [0.018]	-0.028 [0.050]	-0.007 [0.003]***	-1.307 [0.379]***	0.007 [0.112]	-0.397 [0.198]**
Bias-corrected	-0.016 [0.018]	-0.031 [0.050]	-0.002 [0.003]	-2.065 [0.379]***	-0.141 [0.112]	-1.078 [0.198]***
Robust	-0.016 [0.023]*	-0.031 [0.054]	-0.002 [0.003]	-2.065 [0.837]**	-0.141 [0.229]	-1.078 [0.377]***
Observations	106	106	106	1595	1519	1333
<u>Panel F:</u> <u>peasant</u> <u>communes</u> <u>(1905)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	-0.057 [0.019]***	-0.137 [0.048]***	0.002 [0.0026]	-1.684 [0.371]***	-0.141 [0.110]	-0.403 [0.196]**
Bias-corrected	-0.044 [0.019]**	-0.140 [0.048]***	0.007 [0.002]***	-2.315 [0.371]***	-0.277 [0.110]**	-1.145 [0.196]***
Robust	-0.044 [0.024]*	-0.140 [0.058]**	0.007 [0.002]****	-2.315 [0.826]***	-0.277 [0.228]	-1.145 [0.377]***
Observations	106	106	106	1610	1533	1347
<u>Panel G:</u> <u>Nobles (1905)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	-0.048 [0.019]**	-0.147 [0.049]***	-0.007 [0.002]***	-1.522 [0.372]***	-0.251 [0.111]**	-0.367 [0.196]*
Bias-corrected	-0.033 [0.019]*	-0.141 [0.049]***	-0.002 [0.002]	-2.162 [0.372]***	-0.143 [0.111]	-1.120 [0.196]***
Robust	-0.033 [0.023]	-0.141 [0.052]***	-0.002 [0.003]	-2.162 [0.830]***	-0.143 [0.229]	-1.120 [0.378]***
Observations	106	106	106	1610	1533	1347
<u>Panel H: Serfs</u> <u>(1858)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	-0.052 [0.018]***	-0.118 [0.050]**	0.000 [0.003]	-1.460 [0.371]***	-0.100 [0.110]	-0.376 [0.196]*
Bias-corrected	-0.037 [0.018]**	-0.113 [0.050]**	0.005 [0.003]*	-2.217 [0.371]***	-0.253 [0.110]**	-1.043 [0.196]***
Robust	-0.037 [0.022]	-0.113 [0.053]**	0.005 [0.003]	-2.217 [0.830]***	-0.253 [0.229]	-1.043 [0.378]***
Observations	106	106	106	1610	1533	1347

(Continues)

**TABLE 4** (Continued)

Notes: Significance levels:

Sources: Table 1 Imperial rule in the Baltics and Table A.3 Data profiles and sources.

*** $p < 0.01$,

** $p < 0.05$,

* $p < 0.1$. All regressions include a linear polynomial in distance and use 100 km bandwidth. Distance to the South Livonian side of the border is multiplied by -1 , whereas distance to the Courland side of the border is multiplied by 1. For our estimations, we take the logarithm of the monthly average income level. Baseline covariates include large city and capital city agglomeration dummies. In panel A, we include the Lutheran share in the 1897 census of the Russian Empire. In panel B, we include the German share in the 1897 census of the Russian Empire. In panel C, we include the share of Germans in the 1935 census of independent Latvia. In panel D, we include the share of primary education graduates in the 1897 census of the Russian Empire. In panel E, we include the share of landowners who are peasants from the 1878 Land Census of the Russian Empire (the data for the Baltic region were collected in 1885). In panel F, we include the size of land used by peasant communes from the 1905 Land Census of the Russian Empire. In panel G, we include the size of land owned by nobles from the 1905 Land Census of the Russian Empire. In panel H, we include the share of serfs in 1858 from the Bugge and Nafziger (2021) study.

The situation is different for the South Livonia-Courland border, as the German minority played a significant role in the socio-economic development of those areas during both the Russian Empire and the interwar independence period. Mass schooling and a culture of entrepreneurship and social trust that advances contracting may have been the key patterns through which Baltic Germans have shaped the long-run socio-economic development of the Baltic region.

Whilst historical human capital measured by the share of primary education graduates in the Russian Empire census of 1897 may not demonstrate the persistence of the two analysed Swedish-Polish borders (panel D of Tables 4 and 5), the situation is expected to be different when we explore the role of landownership concentration in the Russian Empire census for the Baltic region in 1885. Higher historical shares of landowners who were peasants facilitate the disappearance of both Swedish-Polish borders when the tested outcome is a preference for market economy (panel E of Tables 4 and 5), and the average difference coefficients are computed with bias-corrected and robust CIs. This is also the case for shares of higher education graduates and trust in religious institutions as outcomes across the South Livonia-Lettgallia border as well as for income across the South Livonia-Courland border. Land redistribution under the Swedish Empire and the related policy of the *Reduktion* seem to have perpetuated a strong predisposition towards a market economy and Lutheran religious institutions by rendering landownership a cornerstone of an early modern notion of citizenship. We also utilize the 1905 Land Census of the Russian Empire, where we select two additional likely mechanisms: the size of land owned by peasant communes and the size of land owned by nobles. Whilst the size of land owned by peasant communes appears not to matter for the persistence of the two tested Swedish-Polish borders (panel F of Tables 4 and 5), the size of land owned by nobles (panel G of Table 5) eliminates the significance of the South Livonia-Lettgallia border when the examined outcome was the share of higher education graduates. However, it might not offer any mediating effect for the South Livonia-Courland border (panel G of Table 4). Hence, landownership by peasants was not mutually exclusive with landownership by nobles with respect to the South Livonia-Lettgallia border. Whilst Baltic German nobility appears to have bolstered persistent development differences in favour of the former Swedish partition of South Livonia, peasant landownership may suggest a stronger long-run preference for market economy. Land as a proxy of both nobility privilege and peasant upward mobility may be linked to pro-market attitudes and higher levels of long-run development through its positive spillover effects to local societies (noble landownership) or expansion of contracting and institutions (peasant landownership).

**TABLE 5** Covariate-adjusted RD results with robust bias-corrected CIs: South Livonia versus Lettgallia (1629 borders)—Mechanisms.

Outcomes						
<u>Panel A:</u> <u>Lutheranism</u> <u>(1897)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	−0.005 [0.016]	−0.211 [0.056]***	−0.024 [0.012]**	−0.880 [0.664]	0.905 [0.190]***	−3.780 [0.351]***
Bias-corrected	−0.016 [0.016]	−0.280 [0.056]***	−0.038 [0.012]***	−7.422 [0.664]***	−0.059 [0.190]	−5.709 [0.351]***
Robust	−0.016 [0.024]	−0.280 [0.069]	−0.038 [0.017]	−7.422 [2.057]***	−0.059 [0.673]	−5.709 [1.214]***
Observations	85	85	85	1594	1351	1211
<u>Panel B:</u> <u>Germans (1897)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	0.010 [0.016]	0.035 [0.047]	0.002 [0.011]	0.126 [0.664]	−0.061 [0.190]	−0.989 [0.351]***
Bias-corrected	0.000 [0.016]	−0.028 [0.047]	−0.012 [0.011]	−6.985 [0.664]***	−0.866 [0.190]***	−3.366 [0.351]***
Robust	0.000 [0.025]	−0.028 [0.058]	−0.012 [0.016]	−6.985 [2.057]***	−0.866 [0.673]	−3.366 [1.214]***
Observations	85	85	85	1416	1351	1211
<u>Panel C:</u> <u>Germans (1935)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	−0.005 [0.016]	−0.050 [0.052]	0.018 [0.012]	0.314 [0.664]	−0.190 [0.190]	−0.932 [0.351]***
Bias-corrected	−0.016 [0.016]	−0.0118 [0.052]**	0.004 [0.012]	−6.216 [0.664]***	−1.074 [0.190]***	−3.420 [0.351]***
Robust	−0.016 [0.024]	−0.0118** [0.067]	0.004 [0.017]	−6.216 [2.057]***	−1.074 [0.673]	−3.420 [1.214]***
Observations	85	85	85	1416	1351	1211
<u>Panel D:</u> <u>Human Capital</u> <u>(1897)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	−0.059 [0.016]***	−0.849 [0.058]***	0.106 [0.012]**	−5.618 [0.664]***	−2.015 [0.190]***	−4.730 [0.351]***
Bias-corrected	−0.069 [0.016]***	−0.902 [0.058]***	0.090 [0.012]***	−12.236 [0.664]***	−2.859 [0.190]***	−7.099 [0.351]***
Robust	−0.069 [0.024]***	−0.902 [0.071]***	0.090 [0.016]	−12.236 [2.057]***	−2.859 [0.673]***	−7.099 [1.214]***
Observations	85	85	85	1416	1634	1211

(Continues)



TABLE 5 (Continued)

Outcomes						
<u>Panel E:</u> <u>Landowners</u> <u>(1878/1885)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	0.006 [0.019]	0.058 [0.079]	-0.001 [0.004]	-2.532 [0.740]***	-0.303 [0.179]*	0.009 [0.416]
Bias-corrected	-0.013 [0.019]	0.064 [0.079]	-0.008 [0.004]*	-2.089 [0.740]***	-0.267 [0.179]	-0.264 [0.416]
Robust	-0.013 [0.022]	0.064 [0.106]	-0.008 [0.006]	-2.089 [0.941]**	-0.267 [0.242]	-0.264 [0.633]
Observations	63	63	63	1223	1168	1040
<u>Panel F:</u> <u>Peasant</u> <u>communes</u> <u>(1905)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	-0.020 [0.016]	-0.146 [0.058]**	0.024 [0.012]**	-0.535 [0.664]	-0.088 [0.190]	-1.074 [0.351]***
Bias-corrected	-0.026 [0.016]*	-0.196 [0.058]***	0.012 [0.012]	-5.765 [0.664]***	-0.714 [0.190]***	-2.606 [0.351]***
Robust	-0.026 [0.025]	-0.196 [0.072]***	0.012 [0.018]	-5.765 [2.057]***	-0.714 [0.673]	-2.606 [1.214]**
Observations	85	85	85	1416	1351	1211
<u>Panel G:</u> <u>Nobles (1905)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	-0.005 [0.016]	-0.127 [0.055]**	0.017 [0.012]	-0.753 [0.664]	-0.246 [0.190]	-0.992 [0.351]***
Bias-corrected	-0.016 [0.016]	-0.196 [0.055]***	0.003 [0.012]	-7.433 [0.664]***	-1.105 [0.190]***	-3.478 [0.351]***
Robust	-0.016 [0.024]	-0.196 [0.067]***	0.003 [0.017]	-7.433 [2.057]***	-1.105 [0.673]	-3.478 [1.214]***
Observations	85	85	85	1416	1351	1211
<u>Panel H: Serfs</u> <u>(1858)</u>	Higher education	Income	Unemployment	Law obedience	Market economy	Trust in religious institutions
Method:						
Conventional	-0.018 [0.016]	0.130 [0.052]**	-0.0124 [0.011]***	-3.760 [0.664]***	-0.449 [0.190]**	-5.499 [0.351]***
Bias-corrected	-0.029 [0.016]*	0.056 [0.052]	-0.135 [0.011]***	-8.349 [0.664]***	-1.062 [0.190]***	-5.232 [0.351]***
Robust	-0.029 [0.024]	0.056 [0.060]	-0.135 [0.017]***	-8.349 [2.057]***	-1.062 [0.673]	-5.232 [1.214]***
Observations	85	85	85	1416	1351	1211

(Continues)

**TABLE 5** (Continued)

Notes: Significance levels:

Sources: Table 1 Imperial rule in the Baltics and Table A.3 Data profiles and sources.

*** $p < 0.01$,

** $p < 0.05$,

* $p < 0.1$. All regressions include a linear polynomial in distance and use 100 km bandwidth. Distance to the South Livonian side of the border is multiplied by -1 , whereas distance to the Lettgallia side of the border is multiplied by 1. For our estimations, we take the logarithm of the monthly average income level. Baseline covariates include large city and capital city agglomeration dummies. In panel A, we include the Lutheran share in the 1897 census of the Russian Empire. In panel B, we include the German share in the 1897 census of the Russian Empire. In panel C, we include the share of Germans in 1935 census of independent Latvia. In panel D, we include the share of primary education graduates in the 1897 census of the Russian Empire. In panel E, we include the share of landowners who are peasants from the 1878 Land Census of the Russian Empire (the data for the Baltic region were collected in 1885). The cut-off point for panel E is -15 (-10). In panel F, we include the share of landowners who are peasants from the 1905 Land Census of the Russian Empire. In panel F, we include the size of land used by peasant communes from the 1905 Land Census of the Russian Empire. In panel G, we include the size of land owned by nobles from the 1905 Land Census of the Russian Empire. In panel H, we include the share of serfs in 1858 from the Buggle and Nafziger (2021) study.

Given the crucial role of serfdom in the imperial Russian economy until the Emancipation Act of 1861, we explore the potential role of the share of serfs (1858), drawing evidence from the dataset of the Buggle and Nafziger (2021) study on the long-run effects of historical serfdom. However, our results reported in panel H of both Tables 4 and 5 do not reveal any likely significance of historical serfdom as a transmission mechanism. This makes sense, as serfdom was abolished in 1816 in Estland, in 1817 in Courland, and in 1819 in Livland, leaving only Lettgallia with a set of three districts in the imperial Russian governorate of Vitebsk that generate observations in the Buggle and Nafziger dataset: the Dunaburg district, the Liuzinj district, and the Rjesohiza district.⁸² Furthermore, the later annexation of Courland into the Russian Empire (1795) vis-à-vis Livonia and Estland (1721) has not produced divergent styles and practices of governance throughout the nineteenth century.⁸³ Imperial governors in the Baltic region (Livland, Estland, Courland) were likely to be connected to the central administration in St. Petersburg and its Imperial School of Jurisprudence, an elite school of civil servants.⁸⁴ The economic conditions in the post-Emancipation period (1840s–60s) were severe for the Baltic region including Livonia, Estland, and Courland. At the same time, the Baltic German nobility exerted a significant influence on the status and discretion ability of imperial governors in Estland, Livonia, and Courland.⁸⁵

VII | CONCLUSIONS

In this study, we have explored the persistence of Swedish and Polish–Lithuanian territorial partitions following the Truce of Altmark (1629), which ended the Swedish–Polish war. We have shown that historical borders in the Baltic region exhibit significant strength when it comes to levels of socio-economic development. More specifically, Swedish imperial rule seems to have promoted Lutheranism, Baltic German autonomy, and land redistribution, and in this way, exerted a long-run positive impact on the socio-economic development of the Baltic region. The significance of

⁸² Buggle and Nafziger, ‘The Slow Road from Serfdom’.

⁸³ Andresen, ‘Formal Stipulation and Practical Implementation of Religious Privileges’; Mogilevsky, ‘Provincial Administration and Local Nobility’.

⁸⁴ Mosse, ‘Russian Provincial Governors’.

⁸⁵ Lust, ‘Feeding the Landless’. Bruns, ‘Privilege and Freedom’; LeDonne, *Frontier Governors General*.



the South Livonia–Courland and South Livonia–Lettgallia borders points in this direction. Overall, our results remain insensitive to several robustness checks, including the RD estimation of the Swedish–Swedish border between North Livonia and Estland, the Pale of Settlement, the evaluation of spatial noise presence in the data, the use of placebo outcomes, and the introduction of a quadratic polynomial as well as of different bandwidths in the RD models.

The Treaty of Nystad (1721), which annexed parts of the Baltic region to the Russian Empire in the aftermath of the Great Northern War, designated Russia as the successor of two prior major empires: Sweden and Poland–Lithuania. The economic logic of the Swedish–Polish imperial cleavage is in line with Grosfeld et al. and their comparative analysis of Prussian, Austrian, and Russian partitions of Poland.⁸⁶ In the context of competing empires in the Baltic region, we highlight the persistent effects of competing imperial rules and how these have shaped the political map of East–Central Europe.

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DATA AVAILABILITY STATEMENT

The data will be shared on reasonable request to the corresponding author.

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⁸⁶ Grosfeld et al., ‘Persistent Anti-Market Culture’.



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Additional supporting information can be found online in the Supporting Information section at the end of this article.

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