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Interpersonal violence in South Asia, 900-1900

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Abstract

When did the divergence between South Asia and Western Europe occur? Interpersonal has not received sufficient attention in the debate. In this study, we use a new measure, regicide, which approximates how interpersonal violence developed over centuries. We find that South Asia entered a path of higher interpersonal violence at a relatively early point in time. In a second step, we explore potential correlates of violence in five regions of South Asia. Invasions from Central and West Asia had external effects which increased interpersonal violence, while human capital and urbanization were related to lower violence levels.

Keywords: violence, conflict, South Asia, human capital, regicide, homicide

JEL Codes: N35, N45, O15, O53

We thank participants of the European Historical Economics Congress (Tuebingen) and other colleagues, namely Tom Keywood, Tirthankar Roy, Michelangelo Vastas, Ulrich Woitek, and members of the Tuebingen Economic History group for comments on earlier versions.

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1. Introduction

The great divergence debate is one of the core debates in economic history -- and it has important implications for growth economics in general: Why are some countries poorer today than others, and when did this divergence occur? The “when-question” is important for understanding the causal mechanism because if the great divergence took place quite late, i.e. only after 1800, then colonial mechanisms could have plausibly played an important role. For example, the “California School” argued that the divergence between Europe and China only took place later (Pomeranz 2009, Wong 1997). For South Asia, Parthasarathi (1998) argued that real wages in South India were as high as in Europe in the 18th century. In contrast, if the great divergence already took place during the early Modern Period, then idiosyncratic country developments probably played a strong role. Broadberry, Custodis and Gupta (2015) argued that in South Asia the divergence took place much earlier, already during the early Modern Period.

One potential explanatory variable that has not received sufficient attention in the debate so far is interpersonal violence. We define interpersonal violence as the part of overall violence that takes place outside of inter- and intrastate wars. We will assess the hypothesis that South Asia entered a path of higher interpersonal violence at a relatively early point in time. Deviation from this path was not easy because violence tends to be self-enforcing (Eisner 2011). In highly violent societies, social capital is typically lower. Higher violence is often also correlated with lower human capital investment, which again leads to fewer conflict resolution capabilities. Hence a vicious circle model will be assessed below.

The effect of violence has not been studied systematically and quantitatively for the long run development of South Asia. Findlay and O’Rourke (2009) have assumed violence and power to have played a major role, but quantitative evidence has not been available. In this study, we use a new measure, regicide, which approximates how the intensity of interpersonal violence developed among the elite. This follows the methodological idea of Eisner (2011),

who estimated regicidal trends for Europe since the Middle Ages. The regicide rate is defined as the fraction of potentates that have been violently killed.

In a panel study on European regions, Keywood and Baten (2017) find that a strong correlation exists between regicide and overall homicide (confirming Eisner's trends). Likewise, Baten and Steckel (2017, forthcoming) compared the regicide rate to the proportion of weapon wounds and cranial traumata that were identified among several thousand skeletons in various European regions, and found very similar trends. It seems reasonable to expect a similar correlation for South Asia, and hence, a similar development for the overall interpersonal violence trend. In fact, we compare regicide and homicide rates for different regions and time periods for colonial India and find highly significant correlation coefficients which are consistently above 0.6.

In the following, we first analyze whether Indian rates of violence were comparable to European ones at certain points in time and whether violence in India might have caused the great divergence between the two world regions. In a second step, we explore potential correlates of heterogeneity in violence within five regions of South Asia. Invasions from Central and West Asia had external effects which increased interpersonal violence, while human capital and urbanization were related to lower violence levels.

2. The Great Divergence Debate and Interpersonal Violence

There are two main explanatory approaches in the great divergence debate. The classical view prevailed in the 19th century. Writers like Marx (1853) and Malthus (1803) believed that pre-industrial, country specific differences (demography, social structure, habits, geography) led to different levels in living standards. A number of scholars during the 20th century focused on early developmental hurdles as well (Jones 2003 [1981], Landes 1969). In the 1990s and 2000s, this approach was objected to by the "California School" who based the Western advantage on colonialism. According this school of thought, China and India were

comparable to Europe in their economic performance before about 1800. Bairoch (1982) – as a predecessor – emphasized the South Asian role as a major textile exporter in world markets. He suggested that the great divergence between Europe and Asia only began to take shape clearly between 1830 and 1860 due to a massive influx of European manufactured products.

In the new wave of quantitative studies, authors still disagree about the questions of when the great divergence occurred and what its driving forces were. Broadberry, Custodis and Gupta (2015) argued that the divergence began earlier but gained momentum in the late 18th century when the productivity of the Lancashire textile industry rapidly increased. Clingingsmith and Williamson (2008) studied the two major phases of Indian deindustrialization and concluded that between 1760 and 1810, deindustrialization was partly a result of worsening climate conditions (increasing droughts). Moreover, the dissolution of Mughal hegemony led to a rise in warfare which drew both men and animals away from agriculture. This would support the early divergence hypothesis. However, Clingingsmith and Williamson (2008) suggest that the second phase of Indian deindustrialization, from 1810 until around 1860, was driven by declining world market textile prices due to improved British productivity. Studer (2008) compared the efficiency of grain market prices in India and Europe, concluding that the great divergence must have already taken place in the 17th century and that India suffered from a lack of economic development until the mid-nineteenth century.

Why would violence matter for South Asian development in this context? The drawbacks of high violence for economic development work through several causal channels. Firstly, a high level of violence might lead to mistrust and a general stagnation of economic and governmental development. Resources are used for conflict and are not available for public provision. We will call this the social capital channel.

Secondly, investment into human capital takes only place if there is a realistic expectation to reap its returns. In a violent society, this expectation is much lower as violence

equates to a form of investment risk. In such a situation, the time preference of consumption is drastically higher and an individual will aim at consuming as quickly as possible rather than saving or investing for the future. Moreover, if individuals or certain social groups expect hazards from going to work or sending their children to school, human capital is not used to its full potential. Similarly, foreign investors will rather invest in a country or region where the expected returns are higher. Consequently, both private and public investment into human capital will be lower when violence is high. This is the human capital channel.

A third potential causal channel is that gender inequality is typically higher if violence is high, thereby detrimentally affecting economic development. The comparative advantage of males in violent activity (or defense against it) leads to less female autonomy. These three channels do not impact on development exclusively, but rather reinforce each other.

How did violence approximated by regicide develop in South Asia and Western Europe? The comparison of South Asia and Western Europe in Figure 1 suggests that the South Asian regicide rate was similar to the Western European one in the period 900-1299 CE, i.e. during the early and high Middle Ages. However, between the 12th and 13th centuries and the 14th or 15th century the South Asian regicide rate increases steadily while the Western European rate does not. In the following centuries both regicide rates decline, but the South Asian one is always notably higher. Considering the drawbacks of high violence on economic development, this supports the view that Western Europe already had a better starting position concerning economic growth before the height of the era of colonialization.

In Figure 2, we assess the relationship between regicide and GDP growth for a number of countries. We take an earlier value for the regicide rate because it might take some time until regicide influences GDP growth. In this large sample of countries there was a distinct negative relationship between the 1500-1849 regicide rate and the per-capita-GDP growth rate of the 19th century. Clearly, a number of other variables and causal channels would need to be controlled but this is assessed in a separate study (Keywood and Baten 2017). For our study,

we take the result that regicide could very well have had an effect on GDP growth in the 19th century from this figure. In section 6 we will test which of the aforementioned drawbacks matter in the South Asian context.

3. How can we measure violence for the past millennium?

To approximate the level of violence, the regicide rate will be used in this study. As mentioned above, the particular advantage of the regicide rate is that it can also be obtained for very early periods for which records of homicides and murder do not exist.

This was first demonstrated for Europe. Regicide, the killing of kings, is based on a source of information relating to the interpersonal violence of small, clearly defined social groups about which we have a substantial amount of information. Such social groups consisted of monarchs in the Middle Ages and in the early Modern Period, for example, about whose lives we are normally quite well informed.

Eisner (2011) argued that the largest share of kings were killed either by their own families, their prospective successor for example, or by competing nobility who strove to become ruler as well. There is a small list of special cases, which might be related to the level of interpersonal violence in a country or kingdom, or not. For example, one exception which is less likely related to the interpersonal violence is if a foreign army invaded the country and the king was killed in the battle – especially if the army came from a different culture or another world region. We generally exclude all battle deaths (on battle deaths in Europe, see Cummins 2017).

We can compare regicide with homicide rates for some countries and periods. For Europe, from the High Medieval Period onwards, Eisner (2014) developed estimates of homicide based on trial data, murder, and other sources compiled by him and other historians of crime. Eisner's (2014) evidence on homicide trends indicates a long-term decline of violence in all European countries studied so far (Figure A.1).

It is astonishing how close the relationship between the regicide and the homicide rate is in Europe -- given that the total number of kings that we can include is sometimes very limited (Keywood and Baten 2017). In Germany we see a decline from the 13th to the 14th century which continues into the 15th century, followed by a stable development at a relatively low level in both series (Figure A.2). We have adopted a minimum of five ruler cases per country and century. In Italy it is even more appealing, there is a strong increase from the 13th to the 14th century (Figure A.3). Afterwards, we observe a gradual decline between the 14th and the 18th centuries in both series. For Spain, we have a smaller number of centuries that we can document with both homicide and regicide rates, only the 14th, 16th and 18th century (Figure A.4). But, again, we see a close correspondence between the two series. Finally, in the UK we notice an increase between the 13th and the 14th century, and a decline between the 14th and 16th century (again some gaps, Figure A.5).

The early 14th century appears to be an especially violent period in some European countries. This might have been caused by the very strong population pressure before the Great Plague in the middle of the century and then the turbulence created thereafter. A clear pattern can be observed that the 14th century is the climax point in Italy, Spain and the UK. The only exception is Germany, where the maximum was reached one century earlier.

Keywood and Baten (2017) further analyzed the relationship in a regression analysis using various models. In table A.6, Keywood and Baten (2017) estimate four different models, a fixed effects model (column 1), an OLS model without country and time fixed effects (column 2), and two Least Squares Dummy Variable models with country (column 3) and country/century fixed effects (column 4). The coefficient for regicide is substantial and statistically significant in all of these. In the FE model, increase in regicide from 0 to 1 increases the homicide rate by 112.4 per 100.000 inhabitants and the value is significant. In other words, a one percent increase in regicide equals 1.124 additional homicides. Keywood and Baten always find an effect of a change from zero regicide to every king being murdered

of 110-113 per 100.000 inhabitants. Since the regicide variable is coded between 0 and 1, switching from a high regicide rate, for example, in Spain of around 0.30 to 0.00 reduces the homicide rate in the same country by $112 * 0.3 = 34$ percent. This is a substantial amount.

Does the relationship between regicide and homicide found for Europe apply to South Asia as well? We compare the regicide rates of South Asia to murder rates from colonial records of British India, starting in 1891. We use evidence on 10 principalities and provinces for three different time periods (resulting in 29 cases, one regional unit is lacking for one period). We find that the regicide rate is highly correlated with the murder rate, with a correlation coefficient consistently greater than 0.6. Is this correlation perhaps driven by cultural or educational background variables? In a regression analysis with additional variables, we find that this is not the case: even controlling for education and religion, the connection between regicide and colonial murder rates remains robust (Table 1). Of course, the homicide rate is also not without risk of measurement error because, for example, underreporting is a possibility. However, comparing the two independent proxies of historical violence suggests that our measurement strategy probably reflects the historical reality to a certain degree.

We conclude that regicide is a reasonable proxy for homicide both in Europe and South Asia. Although one could imagine that political developments, such as revolutionary dissatisfaction in the population, might have influenced the regicide rate, most regicides took actually place within families of ruling houses. The share of killed kings in battles or revolutions was surprisingly low (Eisner 2011). The “normal” reason for killing a ruler was that family members wanted to succeed the ruler, hence, they killed their brothers, uncles or other relatives. In other words, these were mostly not political or revolutionary acts (1789 and other modern events were exceptional in long term history); rather, the family members simply wanted to obtain the royal rents and the prestige of being a ruler. We agree with earlier

studies on regicide that these conflicts within royal families reflect general violence in a society (Eisner 2011, Keywood and Baten 2017, Baten and Steckel 2017).

For South Asia, we constructed a data set starting in 900 CE. South Asia was divided into five regions (including Myanmar), taking into account cultural and historical differences - as well as data requirements (Figure 3). We need to use the five large regions in order to cope with historical borders of ancient principalities. A stronger disaggregation would not have been possible because we needed to avoid dividing historical states (the exceptions being the Moghul and Maratha Empires: there we needed to assign the same value to a number of South Asian regions for some of the centuries). The East consists of the north eastern Indian states, plus Bihar, Chhattisgarh, Jharkhand, Odisha, West Bengal and Bangladesh which belonged to the Bengal presidency during colonial times. The Northern part of Southern Asia consists of the Indian states and union territories Chandigarh, Delhi, Haryana, Himachal Pradesh, Jammu Kashmir, Madhya Pradesh, Punjab, Rajasthan, Uttarakhand, Uttar Pradesh and the independent country of Nepal. The South comprises Andhra Pradesh, Karnataka, Kerala, Lakshadweep, Puducherry, Tamil Nadu and Telangana. The West is formed by Dadra and Nagar Haveli, Daman and Diu, Goa, Gujarat and Maharashtra. Today's Myanmar is treated as an extra region so that we obtain five regions in total.

In Figure 4, we show the regicide rates for the regions North, South, East and West India, as well as Myanmar, using time units of 200 years. There was a striking increase and plateau in regicide at a high level between the 12th and 17th centuries, when regicide rates in Europe were already substantially declining (compare to Figure 1). This increase was mainly driven by high regicide rates in North India and a weaker but still considerable upsurge in the Western and Eastern parts of South Asia. The regicide rate in South India stayed at a much lower level (Figure 4). One potential explanation could be external effects from inter-state violence. During this period, an exceptionally large number of invasions originating from Central and Western Asia took place. These were regions in which violence rates were at a

much higher level than in 9th – 12th century India. One of the most brutal invasions was the one of Tīmūr Lang in 1398 (on him and the following, see Manz 2012). His Mongolian and other Central Asian horsemen defeated resistance in Northwest and Northern India and stood before Delhi in December 1398. Before attacking Delhi, Tīmūr Lang ordered the execution of 100,000 Indian captives. When he entered Delhi, he offered an amnesty if the inhabitants offered “protection money”. On the fourth day after they began to collect the payment, Tīmūr Lang changed his mind and enslaved all inhabitants of the city, except 150,000 who fell victim to a massacre. Of course, victim estimates in historical sources are often exaggerated, but the brutality of the invasion is evident, and it had implications for the interpersonal relationships of Indians as well.

Several Central and West Asian invaders managed to set up their own state in India (e.g. Delhi Sultanate), in which additional violent conflicts often arose from setting up rent extraction systems that were not initially accepted by the local population without active or passive resistance.

We should note, as a potential caveat, that the relatively low regicide rates before 1300 CE might be a result of underreporting on one hand. On the other hand, we are generally quite well informed about the killing of rulers. The fraction of missing values for the time span before 1300 CE is even lower (2.44%) than for the whole period (7.33%). Moreover, other studies observe similar values for neighboring world regions (Keywood and Baten 2017).

4. What correlates with the variation in regicide in South Asia? Sources and Definitions

The second part of this study will trace regicide rates in five regions of South Asia and assess potential determinants of its development and cross-sectional differences.

We would expect that human capital of the elite would be negatively related to violence (Pinker 2011). Therefore, we include a variable proxying elite human capital as a potential explanatory factor, being well aware that we cannot claim causality in these regressions. We approximate human capital using another proxy concept that was recently developed (Keywood and Baten 2017): the relative number of kings for which a birth year is known allows tracing medieval “ruler numeracy”. Keywood and Baten (2017) showed that this indicator is positively correlated with other estimates for education for the medieval and early modern period such as manuscript production in monasteries (Buringh and van Zanden 2009). Documenting the birth year of the rulers is not possible without a certain degree of human capital of bureaucratic elites and rulers. For South Asia, the proportion of known birth years among rulers is 0.36 with a standard deviation of 0.37 (Table 2). Hence, the variation is quite substantial.

Myanmar had a high level of elite numeracy until 1500 when compared to the other regions of South Asia (Figure 5). There is some evidence that Myanmar also had relatively high literacy rates due to certain cultural and religious aspects of education: Myanmar had a system of free education provided by Buddhist monasteries, of which there was one in practically every village (Schuhmacher 2007).

For the regression analysis, 50 year averages are used as time units and the four regions are used as cross-sectional units. The data was collected on the basis of the same sources as for regicide (see above).

Invasions from West and Central Asia

We mentioned above that one potential explanation could be the external effect of inter-state violence. During this period, an exceptionally large number of invasions originating from Central and Western Asia took place. To control for such externalities, we included a dummy variable indicating if there was an invasion from Central Asia in a specific region of South

Asia in a given period, or if parts of a region were ruled by a potentate of Central Asian origin during the respective period. While one could imagine a high degree of collinearity with ruler religion if the ruler practiced Islam (see below), we find that the correlation coefficient is “only” 0.42. Nevertheless, the results might seem slightly less significant due to this effect.

Urbanization

To approximate the level of urbanization, we use the city population per square kilometer (created by Dr. Andrea Biguzzi: <http://www.worldcitypop.com> 2012; Statistical Yearbook India 2016).¹ Clearly, for earlier centuries, the presence of a city requires some division of labor, since the agricultural population share needs to produce a sufficient food surplus so the city population can be involved in urban industrial and service sectors. Hence urbanization might be correlated with income growth as well as with human capital. Moreover, a lower population density and a lack of transportation and educational infrastructure increase the costs of sending a child to school (especially relevant in later centuries). This variable increases clearly towards the end of the period (Figure 6). However, interestingly, there is a substantial amount of variation during the early Modern Period as well. For example, during the 18th century, urbanization declined in several South Asian regions.

Human capital index

We observe that city population per area (which is our indicator of urbanization) and our elite human capital proxy are highly correlated. Urbanization also comes with higher human capital levels. This corresponds with the earlier literature which suggested that urbanization and human capital might be correlated (Acemoglu et al. 2002, Bairoch et al. 1988, Baten et al.

¹ We cannot measure the total population for the regions under study, hence we need to take area as a denominator. In Figure A.6 we compared Biguzzi’s data set and the data set of Bosker et al. for European and Middle Eastern city population trends (Bosker et al. covers Europe and the Middle East), and find a close correlation between the two.

2014). We, therefore, construct an index to jointly measure the correlation of these two variables with the regicide rate in a similar way that the UN calculates the human development index. The purpose of this is to measure the joint effect of urbanization and human capital formation. We use the arithmetic mean of the normalized sub-indices bureaucratic elite numeracy (nu) and city population per area (cp):

$$1. \quad \text{Numeracy}(nu) = \frac{nu_{i,t} - nu_{min}}{nu_{max} - nu_{min}}$$

$$2. \quad \text{City Population per area}(cp) = \frac{cp_{i,t} - cp_{min}}{cp_{max} - cp_{min}}$$

$$\text{Numeracy and urbanisation index (NUI)} = \frac{(nu + cp)}{2}$$

Soil suitability

We would expect higher social inequality to be correlated with violence (Fajnzilber et al. 2002, see also the review in Baten et al. 2014). We can assess this at the level of regional differences, but unfortunately not over time. The approach uses geographic soil quality, which changes only modestly over time. We include soil suitability from the FAO for cereals and pastures to approximate social inequality. Meat and dairy products (Lassi, for example) could not be traded over long distances due to the perishability of these products. Hence, this also implies that the poorer population received some of the protein from perishable dairy products which is often correlated with lower inequality (Van Zanden et al. 2014).

In later periods, cotton and other fiber products became cash crops, which are often associated with higher inequality (Moradi and Baten 2006). Hence, we include this agricultural good, expecting a positive relationship with inequality and, potentially, with violence.

City size and city growth rate

This variable indicates if and by how much the number of cities in a region increased or decreased in each respective period. In contrast to the urbanization rate (per area) discussed above, it captures the dynamic development of the urban sector rather than the level of urbanization.

Political Fragmentation: Number of kingdoms per area

We would expect political fragmentation to be correlated with violence, as more conflicts between states might occur if political fragmentation is higher, and there might be externalities on interpersonal violence. We use the number of kingdoms per area to control for political fragmentation. This variable includes all known kingdoms for each half century and area.

During the Middle Ages, a substantial number of kingdoms and Empires coexisted in South Asia. The Moghul Empire expanded rapidly during the 16th century and covered most of the Indian sub-continent at the beginning of the 18th century. However, the Moghul dominion was already taken over by the Maratha Empire, when the East India Company expanded their influence in 1757. The number of kingdoms increased during the 18th century.² Historians of the 19th century (e.g. Latif 1891) pictured the 18th century as a century of darkness and war caused by the fragmentation of the centralized Mughal power into many small successor states. Subsequently, this view was widely challenged. Bayly (1998) proposed that the decline of the Mughal hegemony in the 18th century led to a change in the initial structures but that Indian society did not fall into a century of anarchy. Some

² However, the Maratha Empire controlled great parts of the North Indian sub-continent until the second Anglo-Maratha War in 1803. After the Indian rebellion in 1857 India was directly controlled by the British crown. Several princely states of different scale coexisted. The princely states were granted legal autonomy if they recognized the British authority (Iyer 2010). Myanmar came under British rule between 1826 and 1886 (Saueressig-Schreuder 1986). Before, it was ruled by the Konbaung dynasty that aimed at centralizing the political institutions of the country (Liebermann 1996).

“intermediate groups”, as he calls local traders and service people, could gain from these smaller political entities while others incurred losses.³ Clingingsmith and Williamson (2008) argued that an optimistic picture of the era of declining hegemonic power might be biased towards the experience of small elites in the towns of the successor states (because these groups left the written sources, on which Bayly and others relied). However, this view pays too little attention to the economic decline in rural areas where most of the population lived, according to Clingingsmith and Williamson (2008).

By including this variable we will therefore test whether the increasing number of kingdoms and princely states is connected to higher interpersonal violence.

Religion

We include the share of Hindu rulers relative to Muslim, Sikh and Buddhist rulers. The Muslim era under the Mughals is seen as quite a prosperous period in Indian history (Bayly 1983, Broadberry, Custodis and Gupta 2015). We include this variable to find out whether the regicide rates differ significantly under Muslim dominance in India. To collect the information on the religious affiliation of the rulers we used the same data sources as for regicide (see above).

5. Empirical Analysis

The Model

To assess which variables are related to violence within India we regress regicide on all variables mentioned above, using a panel of five regions and 20 half centuries. When testing the five regions separately, they partially showed first order serial correlation. A Wooldridge-test also indicated some serial correlation in our time dominant panel data. In such a situation,

³ Also compare Alam (1986).

clustering at the regional level is often used. However, we have a panel of a small N and a large T dimension in which clustering does not make sense. Instead, in our main model we use Beck-Katz's (1995) "panel corrected standard errors" (PCSE) that use a Prais-Winston (1954) regression to solve panel-specific AR(1)-autocorrelation among the errors. This model does not differentiate between cross- or time-sectional specific averages for the intercept. Moreover, we included time-invariant soil-suitability variables. A fixed-effect model would not have been able to analyze the significance of variables that do not vary over time. The PCSE, in contrast, allows the impact of variables that are time-invariant to be captured.

Regression Results

Table 3 shows the regression results from PCSE-regression correction for AR(1)-autocorrelation. The numeracy rate is highly significant in each column. This confirms our hypothesis that elite human capital and interpersonal violence are significantly correlated. The invasion variable that takes into account the arrival of Central and West Asian invaders is consistently positive but only sometimes statistically significant. As noted above, a certain degree of collinearity with the religion variables might result in a slightly less significant outcome of this invasion variable in some of the models.

We observe that "city population per area", which is our indicator of urbanization, and our elite human capital proxy are highly correlated. Consequently, city population per area is only significant when the elite numeracy rate is not included (column 6). Hence, we consider both variables as a measure of human capital development, as urbanization is also usually associated with higher human capital levels. In the next step, we assess whether the two variables are jointly correlated with regicide. In Table 4, we observe that the combined index is in fact related with this variable. The R-squares of most models are quite high. We do not claim causality concerning the connection between elite violence and human capital because both directions of action are conceivable. On the one hand, high violence rates hinder

investment into human capital while higher human capital might also ease non-violent conflict resolution.

In both Tables 3 and 4, a higher ratio of Hindu rulers correlates negatively with the regicide rate. The ratio of Muslim and Sikh rulers is not significantly different from the constant which represents Buddhist rule. The effect of the Hindu religion might partly be determined by the lower violence in Southern India because Muslim rulers never occupied it.

The soil suitability for pasture land, our control variable for social equality, shows some negative significance, i.e. it decreases violence. Even though it would also be plausible that lower interpersonal violence leads to better social equality, it is highly unlikely that it altered the soil properties in particular regions. Consequently, we hereby capture the effect that there was less violence among elite groups when conditions for social equality were prevalent.

The number of kingdoms per area is not significantly related to violence. This means that we cannot observe a higher interpersonal violence for more fragmented regions, for example, the central region after the dissolution of the Mughal central power and the emergence of many small princely states in the 18th century. This corresponds to the perspective stated in some of the more recent literature on India in the 18th century. Bose and Jalal (2004) stress that – despite agricultural decline and inter-state warfare around Punjab – regionalization brought about better stability than the Moghul Empire.

6. Conclusion

In this study we analyzed two main questions. First, we assessed the development of violence over time: when did the great divergence between South Asia and Western Europe occur if we take elite violence rates as an indicator? And secondly, we analyzed the correlates of violence within South Asia.

To study the first question, we used a newly developed indicator, the regicide rate, which gauges the intensity of interpersonal violence among elites of a society and is also correlated with the overall level of homicide in the respective regions and periods. A high level of violence implies multiple drawbacks for development through, for example, less trust and lower investment into human capital. We find that regicide rates in most South Asian regions were similar to the ones in Western Europe before 1300 CE, but considerably higher thereafter. While the regicide rate of Western Europe converges to zero after 1500, South Asia could not escape these high violence levels before 1900. The development of violence supports our conjecture that the divergence of South Asia and Western Europe must have taken place at an early point in history, at least if we take violence rates as an indicator.

But what might have caused this development of violence in South Asia, and which factors correspond to different violence levels among South Asian regions? In a second step, we analyzed correlates of violence within South Asia. In particular, we tested the hypothesis that there is a decisive negative relationship between human capital and interpersonal violence. These variables reinforce each other dynamically. Another important variable that we took into account was the occurrence of invasions from Central and Western Asia, which might have had external effects on interpersonal violence within India.

Our data covers five different regions of South Asia and Myanmar from 900 to 1900 with a total of 109 observations. The time units for this panel are half centuries. Since, for early decades, typical indicators for human capital like enrolment rates and income are not available, we develop a new indicator comprising numeric skills of bureaucratic elites and urbanization. This “elite numeracy rate” is approximated by the relative number of kings for which a birth year is known, as documenting the birth year of rulers is not possible without a certain degree of numeracy. Moreover, we control for urbanization as well as its interaction with the “elite numeracy rate”. In addition, we use a set of different control variables including soil suitability, religion and the number of kingdoms per region.

For the regression analysis, we apply Beck-Katz's (1995) "panel corrected standard errors" (PCSE) that uses a Prais-Winston (1954) regression to solve panel-specific AR(1)-autocorrelation of the errors. We find that the invasions from Central and West Asia mattered, especially when explaining the temporal patterns of violence in the South Asian regions. Moreover, our results indicate a significant negative relationship between regicide rates and our human capital index, which confirms our initial hypothesis that elite human capital and elite violence rates are closely interlinked. We do not claim causality in this matter, because both directions of causality are possible. On the one hand, high violence rates hinder investment into human capital. On the other hand, higher human capital might ease nonviolent conflict resolution.

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Table 1 Regression of regicide on murder and additional controls (in Indian presidencies and princely states, 1891, 1911 and 1921)

	(1)	(2)	(3)
murder	0.177*** (0.0307)	0.156*** (0.0407)	0.182*** (0.0350)
numeracy		0.0639 (0.0655)	-0.0479 (0.0836)
hindu			-0.139** (0.0493)
Constant	-0.0892 (0.0522)	-0.118* (0.0605)	0.00664 (0.0865)
Time FE	yes	yes	yes
Observations	29	29	29
R-squared	0.551	0.559	0.689

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: Summary statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
regicide	95	0.198	0.190	0	0.667
numeracy	95	0.363	0.367	0	1
invasion	104	0.269	0.446	0	1
hindu	102	0.553	0.407	0	1
muslim	102	0.240	0.316	0	1
number of cities	100	0.080	0.087	0.007	0.487
number of kingdoms	105	0.274	0.279	0.021	1.340
city population	100	0.636	0.708	0.065	3.924
fibres suitability	109	3.531	2.192	0.567	6.247
pasture suitability	109	1.647	0.921	0.567	2.936
buddhist	109	0.193	0.396	0	1
index	91	0.245	0.233	0.001	1
city growth	95	0.200	0.542	-0.714	2.333

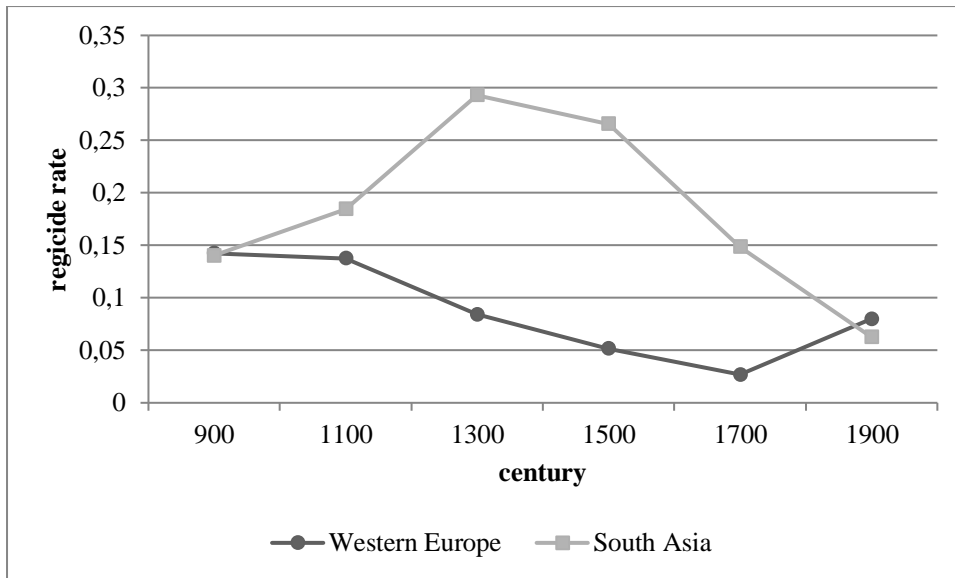
Table 3. Regressions of regicide in five South Asian regions, 900 – 1900 CE. Panel corrected standard errors with AR(1)

	(1)	(2)	(3)	(4)	(5)	(6)
Numeracy	-0.158*** (0.0561)	-0.167*** (0.0539)	-0.135** (0.0598)	-0.139** (0.0606)	-0.133* (0.0713)	
Invasion	0.0652* (0.0352)	0.0648* (0.0360)	0.0492 (0.0418)	0.0539 (0.0416)	0.0733 (0.0449)	0.0622 (0.0423)
Hindu	-0.170*** (0.0430)	-0.172*** (0.0435)				-0.148*** (0.0518)
City growth	0.0159 (0.0255)	0.0235 (0.0270)	0.0154 (0.0304)	0.00996 (0.0286)	0.0217 (0.0329)	-0.00172 (0.0302)
log(city population)	-0.0209 (0.0229)					-0.0457*** (0.0176)
Number of kingdoms	0.0249 (0.0831)	0.0239 (0.0856)	0.0114 (0.101)	-0.0116 (0.0841)	0.0614 (0.0928)	
Pasture suitability	-0.00888 (0.0190)	-0.0103 (0.0180)	-0.0595*** (0.0196)	-0.0628*** (0.0174)		
log(number of cities)		-0.0205 (0.0242)	-0.0159 (0.0271)		-0.0196 (0.0291)	
Cotton suitability					-0.0166 (0.0101)	0.00304 (0.0103)
Constant	0.332*** (0.0663)	0.296*** (0.104)	0.296** (0.120)	0.355*** (0.0508)	0.215* (0.123)	0.232*** (0.0428)
Observations	88	88	88	88	88	88
R-squared	0.253	0.249	0.130	0.120	0.078	0.197

Table 4. Regressions of regicide using a combined human capital/urbanization index, 900 – 1900 CE. Panel corrected standard errors with AR(1)

	(1)	(2)	(3)	(4)
Hum.cap./urban.	-0.282*** (0.0891)	-0.241** (0.0977)	-0.271*** (0.0936)	-0.230*** (0.0485)
Invasion	0.0620 (0.0378)	0.0580 (0.0429)	0.0582 (0.0404)	0.0727* (0.0372)
Hindu	-0.172*** (0.0485)		-0.151*** (0.0585)	-0.167*** (0.0544)
Muslim	0.00231 (0.0638)		0.0156 (0.0700)	0.0204 (0.0603)
City growth	0.0138 (0.0262)	0.0163 (0.0295)	0.0139 (0.0261)	
Number kingdoms	0.0358 (0.0825)	0.0244 (0.0929)	0.0220 (0.0910)	
Pasture suitability		-0.0478** (0.0203)	-0.0105 (0.0184)	-0.00519 (0.0150)
Cotton suitability		-0.00861 (0.00874)		
Constant	0.348*** (0.0491)	0.359*** (0.0481)	0.353*** (0.0490)	0.343*** (0.0470)
Observations	88	88	88	91
R-squared	0.247	0.149	0.244	0.304

Figure 1: Regicide in South Asia and Western Europe, 10th to 20th century



Note: The year indicates the first year of a two centuries (“1300” means: 1300-1499)

Figure 2: Regicide 1500-1849 and per-capita-GDP growth rate 1820-1913

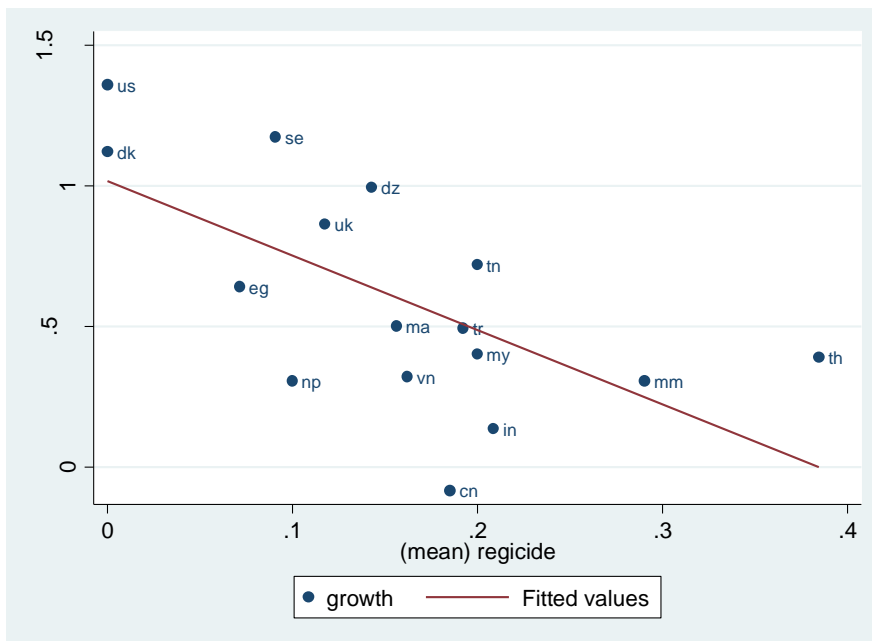


Figure 3: The regions of South Asia used in this study

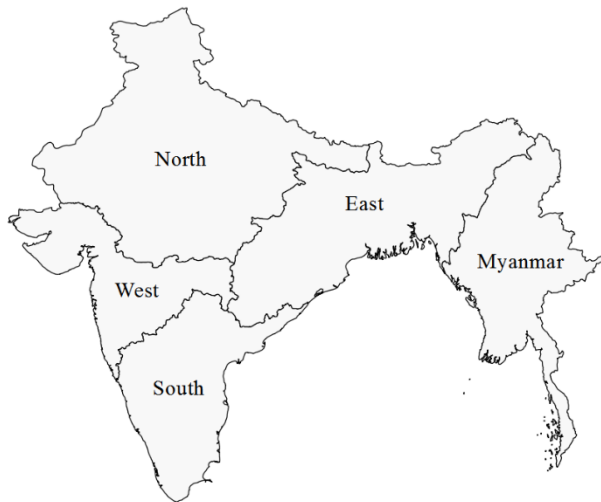
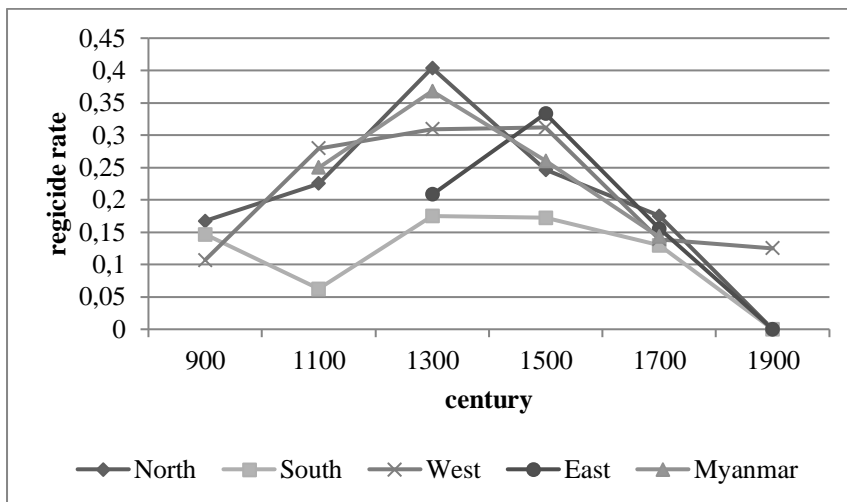
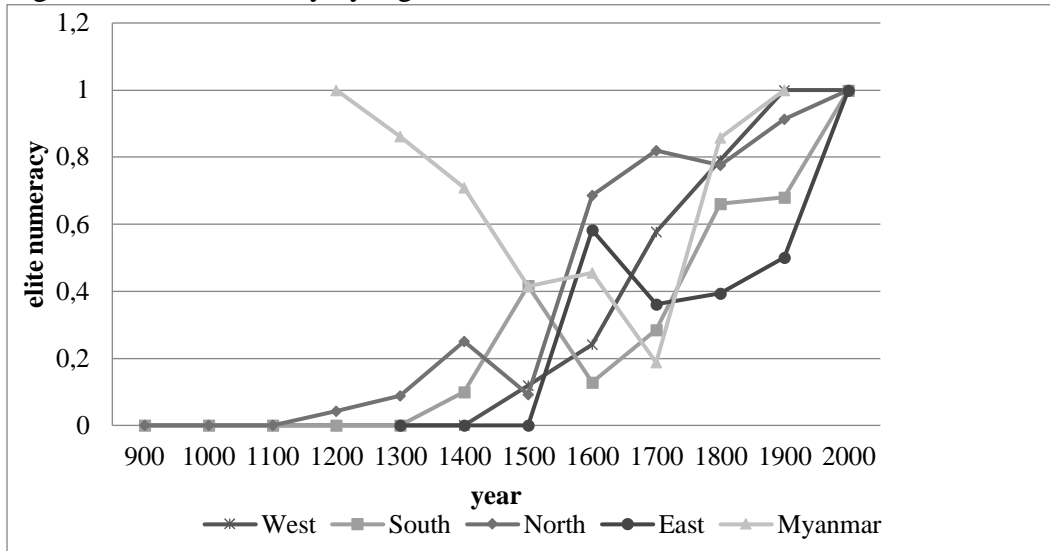


Figure 4: Trends of regicide in South Asia, 10th to 20th centuries



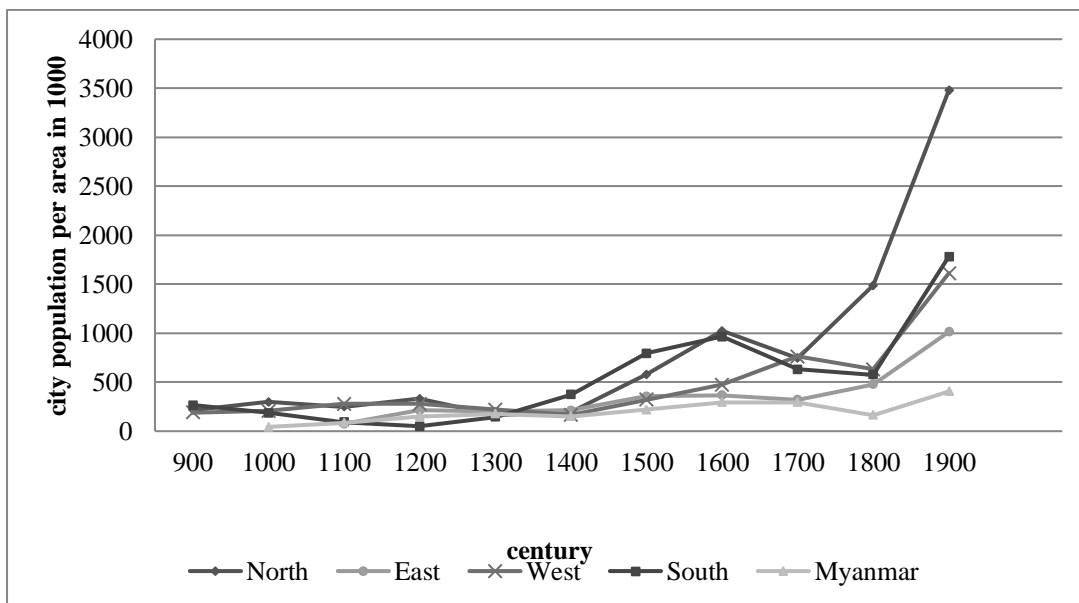
Note: The year indicates the first year of two centuries (“1300” means: 1300-1499)

Figure 5: Elite numeracy by region



Note: The year indicates the first year of two centuries (“1300” means: 1300-1499)

Figure 6: City population per area of the region



Note: The year indicates the first year of two centuries (“1300” means: 1300-1499)

Appendix (to be included as online Data appendix)

Table A.7: Data Sources

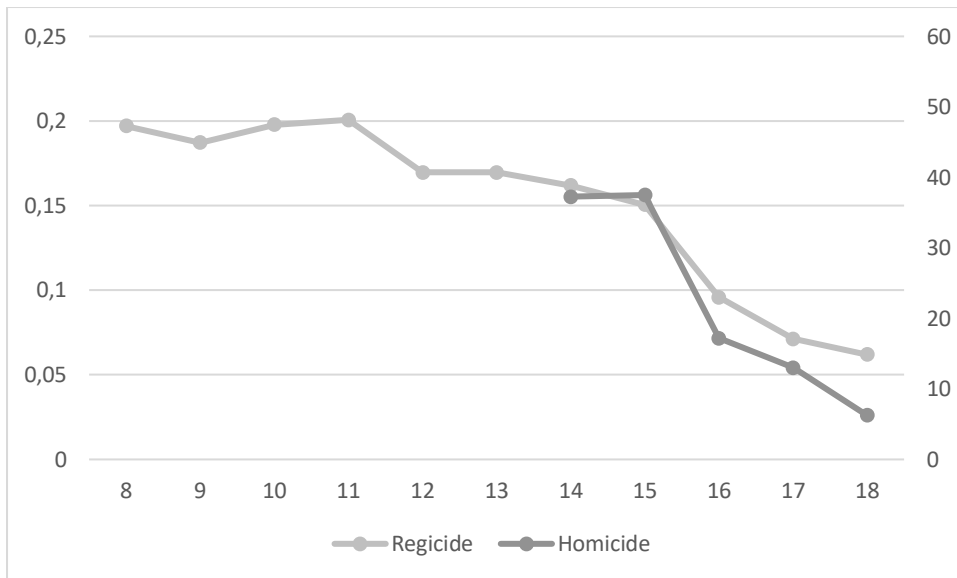
Variable	Sources
regicide rate	Bijapur Sultanate - Cousens, H. (1976). Bījapūr and its architectural remains: with an historical outline of the Ādil Shāhi dynasty (Reprint of the 1916 ed.). Delhi: Bharatiya Pub. House.
numeracy rate	Ahom kingdom - Gogoi, Padmeshwar (1968), The Tai and the Tai kingdoms, Gauhati University, Guwahati
religion	Bharatpur State - Gupta, Kuñjabihārī Lāla The evolution of administration of the former Bharatpur State : 1722 - 1947 / by Kunj Bihari Lal Gupta. - 1. ed. - Jaipur : Vidya Bhawan, [circa 1969]. - VI, 207 Seiten : Ill. - Teilw. zugl.: Univ. of Rajasthan, Diss., 1960
	Bhopal State - Begums of Bhopal / Claudia Preckel. - New Delhi : Lotus Collection, Roli Books, 2000. - 223 Seiten ; 23 cm. - Includes bibliographical references (p. [217]-220). ISBN 81-7436-098-0
	Chahamanas of Jalor - Ashok Kumar Srivastava (1979). The Chahamanas of Jalor. Sahitya Sansar Prakashan. OCLC 12737199.
	Chahamanas of Naddula - Singh, R. B. (1964). History of the Chāhamānas. N. Kishore.
	Chahamanas of Shakambhari - Singh, R. B. (1964). History of the Chāhamānas. N. Kishore.
	Chaulukyas of Gujarat - Thapar, R. (2005). Somanatha: the many voices of a history. Verso.
	Chola Dynastie - Sastri, K. A. N. (1966). A History of South India from Prehistoric Times to the Fall of Vijayanagar: From Prehistoric Times to the Fall of Vijayanagar. Oxford University Press.
	Delhi Sultans - Sen, S. (2013). Textbook of Medieval Indian History. Primus Books.
	Faruqi - Majumdar, R.C. (ed.) (2006), The Delhi Sultanate, Bharatiya Vidya Bhavan, Mumbai. - Shyam, Radhey (1981), The Kingdom of Khandesh, Idarah-i-Adabiyat-i-Delli, Delhi.
	Gorkha Kingdom - Regmi, M. C. (1995). Kings and political leaders of the Gorkhali Empire, 1768-1814. Orient Longman.
	Governors and Sultans of Bengal- Majumdar, R.C. (ed.) (2006), The Delhi Sultanate, Bharatiya Vidya Bhavan, Mumbai.

Gwalior State - Krishnan, V. S. (1965). Madhya Pradesh district gazetteers. District Gazetteers Dep.
Hoysala Empire - Kāmat, S. (1980). A concise history of Karnataka: from pre-historic times to the present. Bangalore: Archana Prakashana.
Indore State - Sethi, P. K., Bhatt, S. K., & Holkar, R. (1976). A Study of Holkar State Coinage. Indore: Can be obtained from Bhat
Jodhpur (Marwar) - Hunter, W. W. (1908). Imperial Gazetteer of India.. (Vol. 12). Clarendon Press.
Keladi Nayaka Kingdom - Karnataka State gazetteer: Shimoga district. (1975). Bangalore: Government Pr.
Kingdom of Kochin - Thampuran, R. (1989). Genealogy of Cochin Royal Family: Tripunithura.
Kingdom of Manipur - Singh, L. J. (Ed.). (1995). The lost kingdom: Royal chronicle of Manipur. Prajatantra publishing house.
Kingdom of Travancore - Varma, U. T. M. (2012). A visual history of Travancore. Kottayam: Malayala Manorama.
Kolhapur - Maharashtra State gazetteers. - Kolhapur district ; Suppl. (1980). Bombay: Gazetteers Dept., Government of Maharashtra.
Kutch State - Patel, G. D. (1971). Kutch district. Ahmadabad: Govt. Print., Staty. and Publ.
Madurai Nayak Kingdom - Aiyar, R. S. (1991). History of the Nayaks of Madura. Asian Educational Services.
Maharajas of Mysore - Kāmat, S. (1980). A concise history of Karnataka: from pre-historic times to the present. Bangalore: Archana Prakashana.
Maratha Empire - Sen, S. (2013). Textbook of Medieval Indian History. Primus Books.
Mughal Emperors - Robinson, F. (2007). The Mughal Emperors: And the Islamic Dynasties of India, Iran and Central Asia, 1206-1925. Thames & Hudson.
Nawab of the Carnatic - Ramaswami, N. S. (1984). Political History of Carnatic under the Nawabs. Abhinav Publications.
Nawab-Viziers of Oudh - National Information Centre of Lucknow: http://www.lucknow.nic.in/history1/histri.html
Nayakas of Chitradurga - Omics International: http://research.omicsgroup.org/index.php/Nayakas_of_Chitradurga
Nizams of Hyderabad - Sen, S. (2013). Textbook of Medieval Indian History. Primus Books.
Paramara dynasty - Epigraphia Indica. (1892). (Vol. I). Janpath, New Delhi: The Director General Archeological Survey of India

	Princely State of Jammu and Kashmir - Meyer, W. S., Burn, R., Cotton, J. S., & Risley, H. H. (1908). The Imperial Gazetteer of India.
	Pudukottai State - Meyer, W. S., Burn, R., Cotton, J. S., & Risley, H. H. (1908). The Imperial Gazetteer of India: Oxford: Clarendon Press.
	Qutb Shahis - Sen, S. (2013). Textbook of Medieval Indian History. Primus Books.
	Rampur State - Ramaswami, N. S. (1984). Political History of Carnatic under the Nawabs: Abhinav Publications. . Rampur. (1975). Lucknow: Govt. of Uttar Pradesh.
	Rashtrakutas of Manyakheta - Kāmat, S. (1980). A concise history of Karnataka: from pre-historic times to the present. Bangalore: Archana Prakashana.
	Sharqi Sultans of Jawnpur - Majumdar, R. C. (1960). The Delhi Sultanate (Vol. 6): Bharatiya Vidya Bhavan.
	Sikh Empire - Dātā, P. S. (1986). The Sikh empire : (1708 - 1849 A.D.). Delhi: National Book Shop.
	Sultans of Gujarat - Sen, S. (2013). Textbook of Medieval Indian History. Primus Books.
	Tanjavur Marathas - Subramanian, K. R. (1988). The Maratha rajas of Tanjore (1. AES repr. [d. Ausg. Madras] 1928 ed.). New Delhi [u.a.]: Asian Educat. Services.
	Udaipur (Mewar) - Meininger, I. (2000). The kingdom of Mewar : great struggles and glory of the world's oldest ruling dynasty (1. publ. ed.). New Delhi: D. K. Printworld.
	Vijayanagara Empire - Sen, S. (2013). Textbook of Medieval Indian History. Primus Books.
	Western Chalukya - Sen, S. (2013). Textbook of Medieval Indian History. Primus Books.
	Burmese kings - Tin, P. M., & Luce, G. H. (1923). The Glass Palace Chronicle of the Kings of Burma.
political fragmentation	Kingdoms- Stein, B. (1998). A history of India. Oxford: Blackwell http://www.worldstatesmen.org
Invasion	Stein, B. (1998). A history of India. Oxford: Blackwell
urbanisation	City population and number of cities - Dr Andrea Biguzzi; http://www.worldcitypop.com
city size and city growth rate	State Area -Statistical Yearbook of India 2016: http://www.mospi.gov.in/statistical-year-book-india/2016/171
soil suitability	FAO

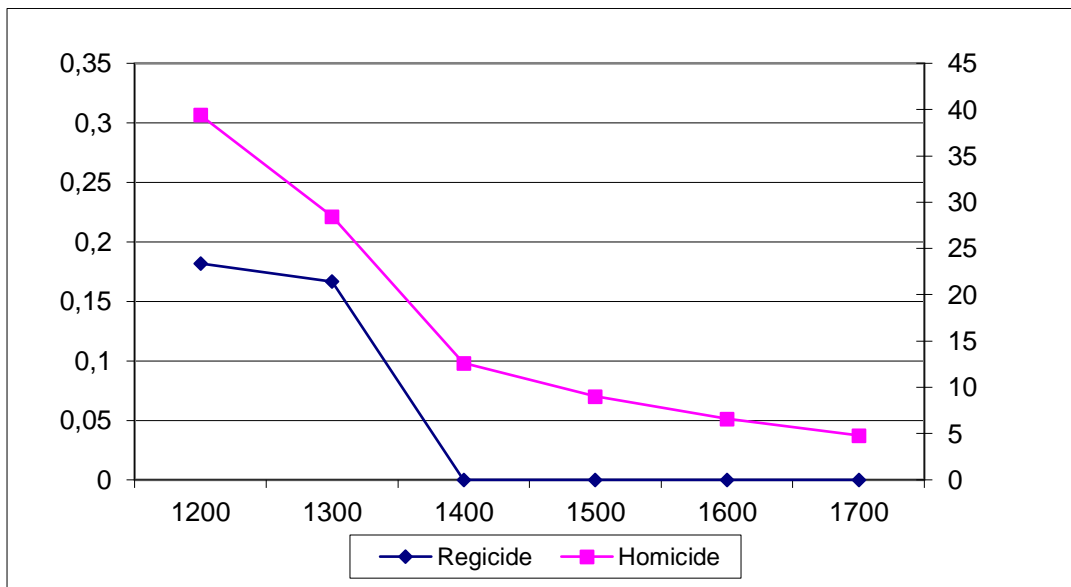
Appendix (not to be included)

Figure A.1: Homicide and regicide (the killing of kings)



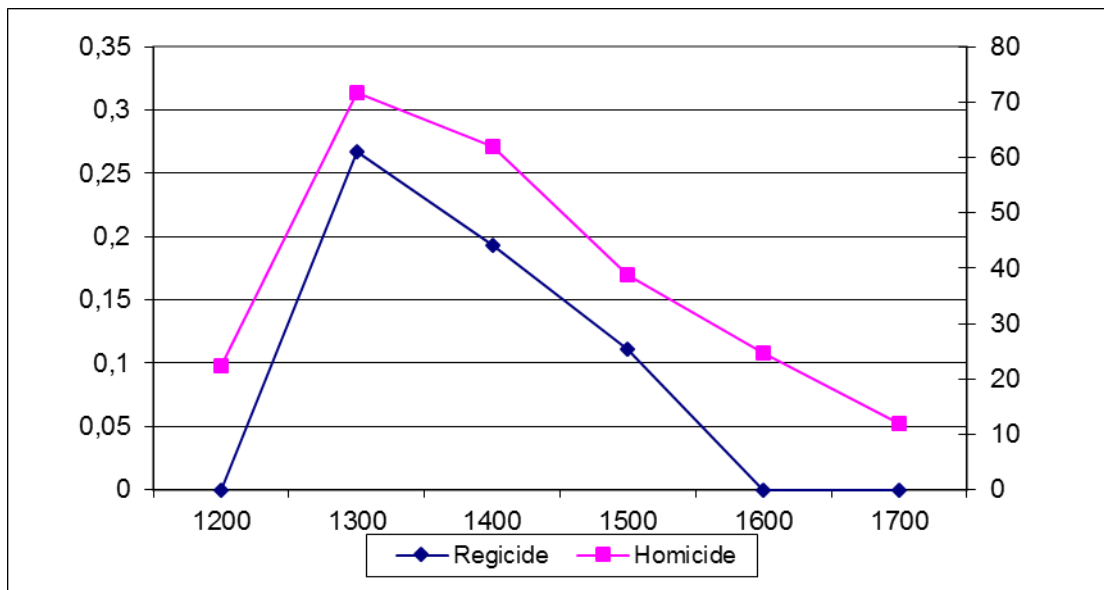
Source: Eisner (2014) for homicide per 100.000 population, right axis; regicide, recalculated based on Eisner's (2011) approach see Baten and Steckel (2017), defined as fraction between 0 and 1, left axis.

Figure A.2: Regicide rate and homicide rate in Germany



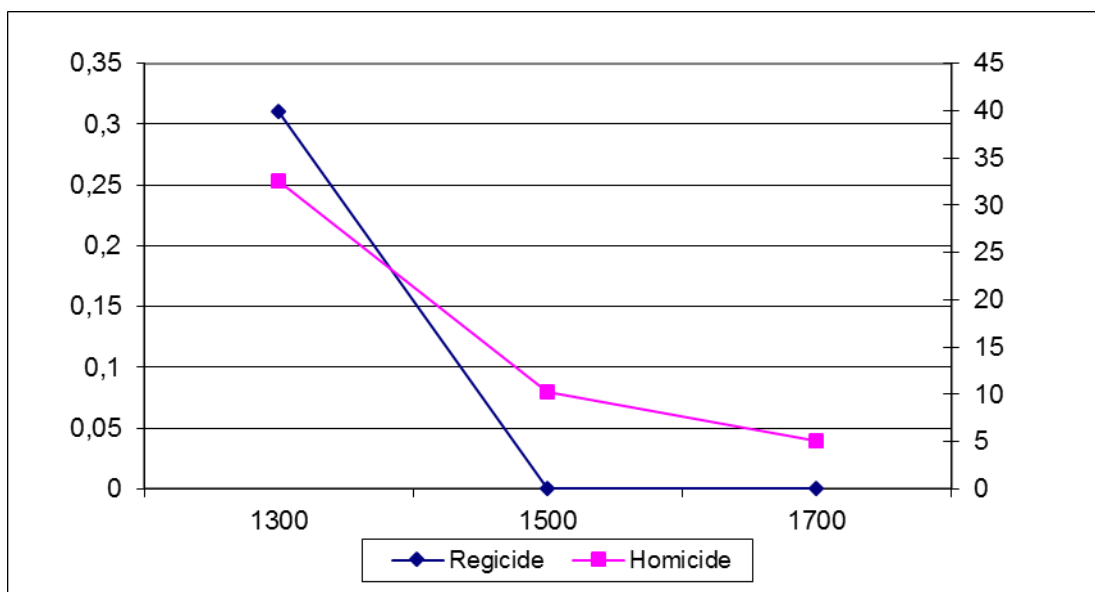
Source: Keyword and Baten (2017). Note: left axis fraction of regicide, right axis homicide per 100.000 inhabitants. The year indicates the first year of two centuries ("1300" means: 1300-1499)

Figure A.3: Regicide rate and homicide rate in Italy



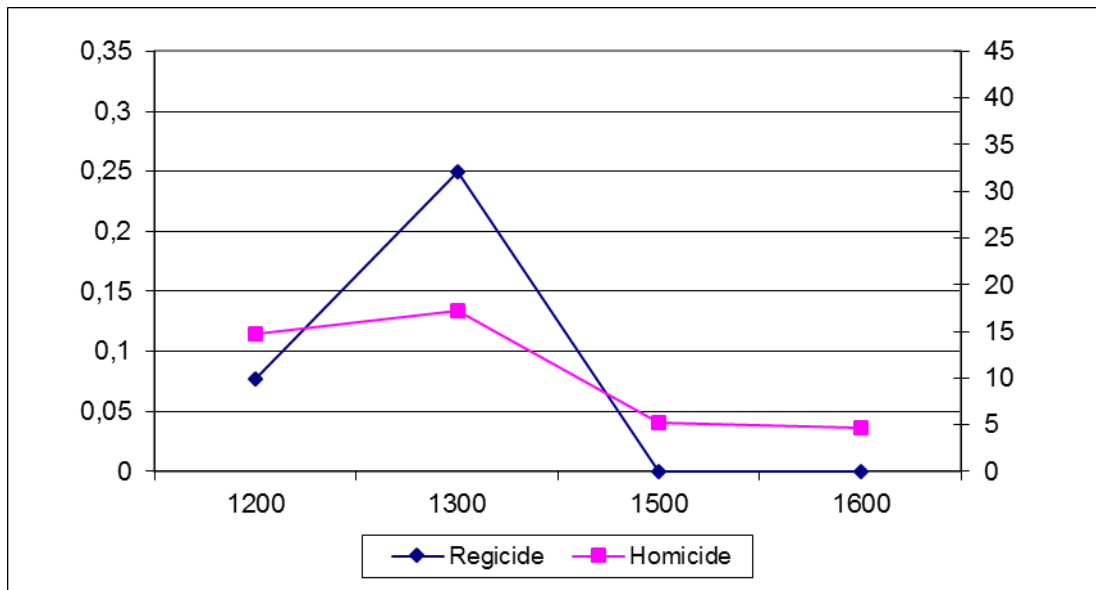
Source: Keyword and Baten (2017); Note: left axis fraction of regicide, right axis homicide per 100.000 inhabitants. The year indicates the first year of two centuries (“1300” means: 1300-1499)

Figure A.4: Regicide rate and homicide rate in Spain



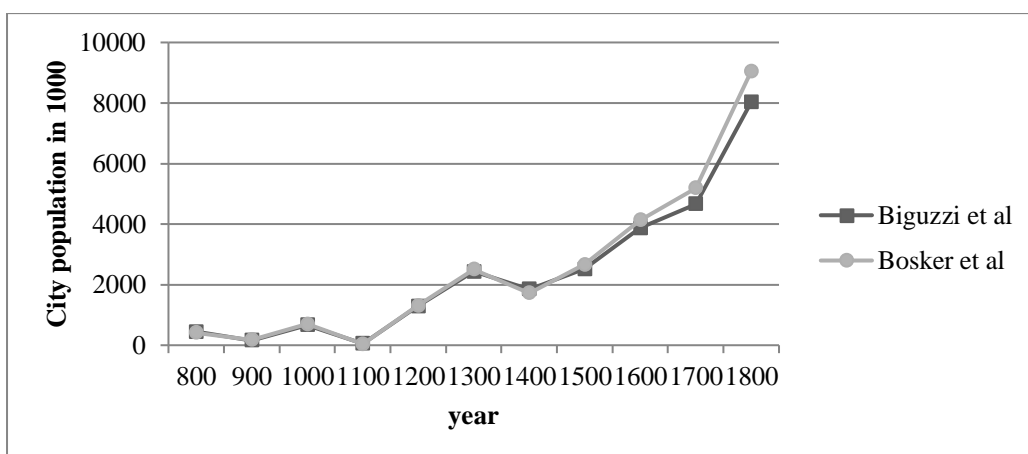
Source: Keyword and Baten (2017). Note: left axis fraction of regicide, right axis homicide per 100.000 inhabitants. The year indicates the first year of two centuries (“1300” means: 1300-1499)

Figure A.4: Regicide rate and homicide rate in the UK



Source: Keywood and Baten (2017). Note: left axis fraction of regicide, right axis homicide per 100.000 inhabitants. The year indicates the first year of two centuries (“1300” means: 1300-1499)

Figure A.5: Comparing city population of Bosker et al. and Biguzzi for Europe and the Middle East



Note: the following countries are included: Austria, Belgium, Bulgaria, France, Germany, Hungary, Iraq, Ireland, Italy, Netherlands, Norway, Portugal, Romania, Spain, Sweden, Switzerland, Tunisia, Turkey, UK, Yugoslavia. The year indicates the first year of two centuries (“1300” means: 1300-1499)

Table A.6: Regression of homicide on regicide, various models (Keywood and Baten 2017).

	(1)	(2)	(3)	(4)
Econometric				
Method	FE	OLS	LSDV	LSDV
Regicide	112.405***	110.888***	112.405***	112.733**
P-Value	(0.000)	(0.008)	(0.000)	(0.016)
Country FE	Yes, FE	No	Yes	Yes
Time FE	No	No	No	Yes
Constant	10.970***	11.101***	10.280***	13.258*
	(0.000)	(0.000)	(0.001)	(0.080)
R-sq	0.408	0.408	0.786	0.867
N	22	22	22	22