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The Effect of Changes in Border Regimes on Border Regions Crime Rates: Evidence from the Schengen Treaty

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Abstract

In recent years many countries increased border controls, partly in response to public concerns that open borders are favoring cross-border crime. Despite these widespread concerns, empirical research on whether public fears are justified is still scarce. This article evaluates whether the abolishment of border controls at the eastern German and Austrian borders accompanying the implementation of the Schengen Treaty in December 2007 increased crime rates in border counties of these countries. Based on official crime statistics, conditional difference-in-differences estimation allows the evaluation of border controls in a causal way. Results show that in Germany and Austria only for burglaries a significant positive effect can be observed suggesting that for this type of criminal offense, public concerns proved to be justified. In contrast, for overall crime rates as well as for other common types of crime against property no significant effect can be observed, indicating that there is only little empirical evidence for the widespread concerns about public security.

Keywords: Crime Rates, Border Regions, Schengen Treaty, Open Borders

JEL Classification: K42, R10

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1 Introduction

Public fears of cross-border crime appear to be particularly high in border regions. For example in the U.S., media frequently reports that along the Mexican border U.S. ranchers and other citizens live in strong fear of crime (see, for example, NBC, 2011). This coverage may be one reason for U.S. president Trump's plans to increase the protection of the U.S. Mexican border by a wall. Another example are German regions bordering Poland and the Czech Republic. For these regions media coverage suggests that public concerns regarding cross border crime are stronger than in other German regions (see, for example, Rother, 2007; Weber, 2007). In the U.S. and in Germany, these fears might be an explanation for the presence of vigilante groups in several border communities (Bangel, 2014; Bederke, 2014). Additionally, in East Germany border regions witness comparatively high voting shares for right-wing populist parties such as the AfD (Alternative for Germany), which focus in their campaign on security and reducing crime committed by foreigners (Land Brandenburg, 2014).

Although there is an emotional and controversial public debate about crime in border regions and many countries recently increased or plan to increase their border controls, empirical evidence investigating whether changes in border regimes affect crime rates is missing. One related strand of literature focuses on the effects of changes in migration policies on crime. The main conclusion of this literature is that higher levels of immigrants in a given region significantly correlate with higher crime rates in crimes against property, i.e. burglary or thievery, but not with higher crime rates in crimes against the person (see, for example, Bell *et al.*, 2013 for Great Britain; Bianchi *et al.*, 2012 for Italy; and Alonso-Borrego *et al.*, 2012 for Spain). However, as changes in border regimes can be independent of changes in migration policies, sole changes in border regimes may have different effects on crime rates. Therefore, a policy which predominantly changes border regimes but does not affect migration policies is necessary to identify the pure effect of border controls changes on crime.

This article investigates a policy which changed border regimes while migration laws were unchanged. More precisely, we examine the abolishment of border controls between Germany and Poland, Germany and the Czech Republic and Austria and its eastern neighbors (Slovenia, Hungary, Slovakia, Czech Republic) in December 2007, accompanying the Schengen Treaty. The Schengen Treaty allowed to cross the German and Austrian eastern borders without passport or any other type of border controls from 21st Dezember 2007 onward and it implemented measures designed to create a common area of security and justice. In contrast, the freedom of movement for eastern European workers was not introduced before 1st May 2011. For our analyses, we

use official data of reported crimes of the German and Austrian Police Crime Statistics on the county level. Effects are identified by conditional difference-in-differences estimations that allow the evaluation of the Schengen effects in a causal way. The empirical results depict no significant increase in overall crime rates in border regions after the Schengen Treaty has been implemented. For burglaries, however, the empirical analysis reveals a statistically significant increase in both countries. At the same time, the empirical findings show that for other, more common types of criminal offenses, including thievery from motor vehicles, drug-related crimes, or street crime, the abolishment of border controls accompanying the implementation of the Schengen Treaty in eastern European EU countries revealed virtually no effect on crime rates.

While other studies focused on cross border spill-over effects of criminal activity, such as corruption, (e.g. Correa et al. 2016), to our knowledge, we are the first to analyze the change in border regimes on crime in border regions. In light of the current discussion of stronger border protection worldwide, and in particular of the future of the Schengen Zone and the U.S. Mexican border, our results give important new insights. First, the experience of the German and Austrian eastern borders shows that changes in border regimes have only little effects on crime rates in border regions and that the public fears of open borders causing higher criminality are generally unjustified. Second, since changes in border regimes do not affect crime rates, politicians should be aware that closing borders is unlikely to constitute a panacea to reduce crime. This insight may be important when center politicians face the political paroles and claims of populist parties and politicians who promise that stronger border controls will reduce crime.

The remainder of the article is structured as follows: Section 2 identifies the mechanisms through which changes in border regimes and in particular the abolishment of border controls accompanying the implementation of the Schengen Treaty in eastern European EU countries may affect crime rates in border regions. Section 3 describes the empirical strategy, while Section 4 reports the empirical results. Finally, Section 5 concludes.

2 Theory

2.1 Regional Crime Rates

The theoretical starting point in this article is the standard rational choice model of crime participation introduced by Becker (1968) and revised by Ehrlich (1973).[1] According to the

[1]For a detailed discussion on the model at the regional level, see, for example, Soares (2004) or Entorf and Spengler (2000).

model, an individual will engage in crime if the returns from committing a crime outweigh the returns from non-criminal behavior. The returns from committing a crime are calculated relative to the probability of getting caught and the expected sanction if caught. Hence, an individual may commit a crime if:

$$(1-p)U(Crime) - pU(S) > U(Non\text{-}Crime),$$

whereby $U(Non\text{-}Crime)$ denotes the utility from abstaining from crime, $U(Crime)$ denotes the utility from a successful crime, i.e. a crime in which the perpetrator is not caught, p denotes the probability of being caught, and S the monetary-equivalent sanction if caught (Soares, 2004). Whether an individual will engage in criminal activities then depends on the anticipated costs and benefits of criminal behavior compared to legal behavior. Translated to the regional level, this means that the more prevalent the conditions which make crime attractive in a region, the higher the crime rates within a region are (Soares, 2004).

In the spirit of the Becker-Ehrlich model, the conditions that make crime more or less attractive within a region are frequently attributed to the level of deterrence and to the level of legal and illegal income opportunities within a region (see Entorf and Spengler, 2000 for the German context). The level of deterrence is commonly indicated by the regional clearance rate and the level of sanctions. Legal and illegal income opportunities can be approximated by several regional characteristics such as the regional income structure, the regional unemployment rate, or the regional GDP.

The income level within a region can thereby serve as an indicator for both the presence of more or less rewarding jobs and, in turn, higher or lower legal income opportunities within a region. Similarly, it can serve as an indicator for higher or lower levels of transferable assets within regions, making these regions more or less lucrative targets for potential offenders (Entorf and Spengler, 2000). The same is true for the regional GDP. Further variables that are commonly identified in the literature as affecting a regions' susceptibility to crime include the regional unemployment and youth unemployment rate, the regional demographic structure, the share of foreigners and the regional level of educational attainment (see Entorf and Spengler, 2000 for the German context).[2] Regional crime rates may thus be driven by two sets of factors: firstly factors that are associated with the level of deterrence, and secondly factors that are associated with legal and illegal income opportunities within a region. Motivated offenders should then

[2]Additionally, studies find that incapacitation affect crime rates, e.g. Munyo (2014). However, incapacitation is not relevant in our study because it appears unlikely to be affected by the Schengen Treaty.

choose committing a crime in region i rather than in region j when the difference between the utility of committing a crime relative to non-criminal behavior is larger in region i than it is in region j.

2.2 Changes in Border Regimes under the Schengen Treaty and Crime Rates in Border Regions

When border controls are abolished – as it has been the case when the eastern neighbors of Germany and Austria implemented the Schengen Treaty on 21st December 2007 – any change in crime rates in border regions following the change in border regimes could be attributed to either an increase in crimes committed by domestic offenders or to an increase in crimes committed by offenders from abroad. These offenders from abroad may choose to commit a crime in border regions on the other side of the border rather than in their domestic region or rather than abstaining from criminal activities.

Regarding the first possibility, the abolishment of border controls between Germany and Austria and their eastern neighbors that accompanied the implementation of the Schengen Treaty, should not affect the utility of domestic offenders, since for them, the probability of getting caught $(1 - p)$ and the level of sanctions S should not change when keeping all other factors constant. Furthermore, regional characteristics that affect legal and illegal income opportunities, such as regional employment rates or income levels, should remain stable. This is especially the case, as the implementation of the Schengen Treaty in eastern Europe did not go hand in hand with free movement of labor for eastern European employees, which was only established in May 2011. German or Austrian employees did, thus, not experience a decline in wages or a crowding-out effect by their eastern neighbors. Hence, for domestic offenders, the utility of committing a crime $U(Crime)$ and the utility form non-criminal behavior $U(Non\text{-}Crime)$ should, ceteris paribus, not be affected by the implementation of the Schengen Treaty in eastern Europe.

In contrast, for motivated offenders and criminal networks from the East, the implementation of the Schengen Treaty and the resulting abolishment of border controls between Germany and Austria and their eastern neighbors may increase the utility of committing a crime in German and Austria border regions relative to the utility of committing a crime in domestic regions or the utility from non-criminal behavior. Hence, the removal of border controls may decrease the probability of getting caught p when committing a crime in German and Austrian border regions. This may be the case despite the fact that the implementation of the Schengen Treaty

did not only include the abolition of border controls between Germany and Austria and its eastern neighbors, but also resulted in measures designed to create a common area of security and justice. Hence, the abolishment of border controls has been accompanied by measures to combat cross-border crime, close police and juridical cooperation among Schengen states, mobile patrols in border areas and improved police networking and access to the Schengen Information System (SIS), which provides data on persons in connection with inquiries by police and judicial authorities (German Department of Foreign Affairs, 2016). Yet, the fact that cross-border law enforcement had not been fully implemented between Germany and Austria and their eastern neighbors when the eastern EU countries joined the Schengen Zone (Schwell, 2015) strengthens the assumption that motivated offenders from the East have a lower probability of getting caught after the abolishment of border controls. These offenders can thus expand their operation radius to Germany and Austria without facing a higher probability of getting caught. The geographic location of German and Austrian border regions possibly makes these regions more attractive targets than other German and Austrian regions, given the potentially lower transaction costs for offenders from the East. Such lower transaction costs may result from lower transportation costs and a higher familiarity of offenders with these geographically close border regions compared to more distant regions (for a similar argument for the Swedish-Danish border, see Ceccato and Haining, 2004).

When offenders from the East are no longer penalized by a higher probability of getting caught when committing a crime in German or Austrian border regions, these regions may constitute more lucrative targets compared to eastern Europe regions. This results from the large wealth differential between Germany and Austria and its eastern neighbors. For example, the Gross National Income (GNI) per capita, measured in purchasing power parties, of Poland and the Czech Republic amounted to merely 40% of that of Germany in 2006, i.e. a year before Poland and the Czech Republic implemented the Schengen Treaty (Baas and Brücker, 2010). German and Austrian regions might thus be better endowed with transferable assets. At the same time, offenders from the East may face lower sanctions S when committing crimes in Germany or Austria than in their home countries, given that the punitivity is higher in eastern Europe than it is in Germany (Dünkel and Geng, 2013 give evidence for higher punitivity for Poland and the Czech Republic).[3] This may further increase the utility for committing crimes in German border regions relative to committing a crime in domestic regions or relative to the utility for

[3]Hence, the rate of prisoners, which is commonly used as an indicator for the punitivity within a country, is higher in Poland and the Czech Republic than it is in Germany. In 2012, for example, Poland had 220 prisoners per 100,000 inhabitants and the Czech Republic 219 prisoners per 100,000 inhabitants, whereas the rate of prisoners in Germany amounted to merely 83 prisoners per 100,000 inhabitants in the same year (Dünkel and Geng, 2013).

abstaining from criminal activities.

3 Empirical Strategy

3.1 Crime Rates in German Border and Non-Border Regions

The empirical analysis aims at identifying the causal effect of the implementation of the Schengen Treaty in eastern European EU countries on crime rates in the German and Austrian border regions. The Schengen Treaty and the subsequent removal of border controls came into force on 21st December 2007, when eight eastern European states implemented the Schengen Treaty. Although the implementation of the Schengen Treaty is predominantly associated with the abolishment of border controls, it is important to note that the Schengen Treaty also includes an increase in cross-border police cooperation and other measures designed to create a common area of security and justice. It is, therefore, not possible to isolate the pure effect of the abolishment of border controls. Instead, the identified Schengen effect can only be interpreted as an interplay of both, the abolition of border controls and the implementation of measures to combate cross-border crime.

Our main empirical analysis is based on annual panel data of German counties (Landkreise) for the years 2004 to 2008. The lower bond 2004 is given by the accessibility of official crime data at the county level. The last year of the observation period, 2008, is also determined by the availability of data. Because regional borders in Saxony changed in the course of local governmental reorganization, it is not possible to compare crime data for years before 2009 and after 2009 in Saxon regions. However, as criminal networks may need time to re-organize their activities across open borders, the extent of the Schengen effect may not be visible in the first year after the change in border regime. Therefore, we conduct a robustness check by using crime rates from 2004 until 2011, while excluding counties in Saxony.

Figure 1 maps the 31 German counties that share a border with Poland or the Czech Republic. These regions constitute the treatment group in the subsequent analysis.[4] Data on regional crime rates, i.e. the annual number of reported crimes per 1,000 inhabitants, are compiled from the official German Police Crime Statistics (Polizeiliche Kriminalitätsstatistik) for the Federal Republic of Germany provided by the Federal Criminal Police Office (Bundeskriminalamt). The

[4]The empirical analysis is based on the county classification for 2007, i.e. the year the Schengen Treaty was implemented in Poland and the Czech Republic. In Saxony-Anhalt, regional borders also changed during the observation period. However, in Saxony-Anhalt, crime rates for 2008 could be recalculated in accordance with the distribution of inhabitants for the years prior to the reform.

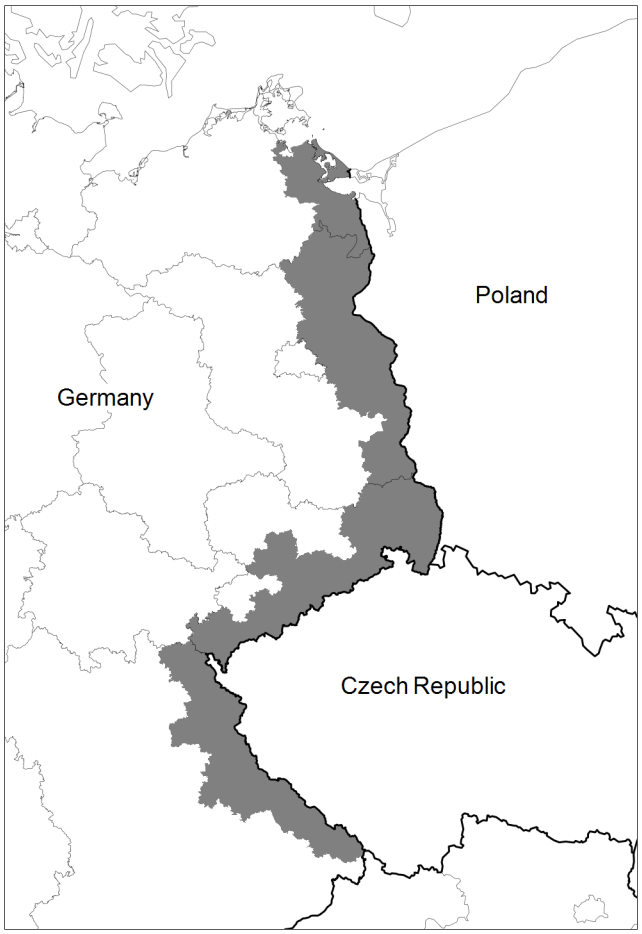

Figure 1: Map of German counties located at the border to Poland and the Czech Republic

Police Crime Statistics are so-called outgoing statistics. This means that the statistics contain only those offenses which have come to the attention of the police and have been passed to the public prosecutor's office before compilation began (see Bundeskriminalamt, 2016 for detailed information on the data). The Police Crime Statistics thus do not contain undetected criminal offenses. Therefore, the data do not reveal the real number of crimes within a region, but only the number of recorded cases, which may differ across regions and across types of criminal offenses. Yet a recent study conducted at the German Institute of Economic Research (DIW) shows that in Germany regional crime patterns are – with some exceptions – comparable when including dark figures, i.e. underreported crimes (Bug *et al.,* 2015). Along with the overall regional crime rate, the regional crime rates for selected crimes against property are also examined. This accounts for the fact that crimes against property such as burglary, thievery, drug-related crimes, criminal mischief and street crime are mostly economically driven and should thus be

particularly affected by the changes in border regime.[5]

Figure 2 depicts crime rates of the counties located on the border to Poland and the Czech Republic for the years 2006 and 2008, i.e. one year prior to and one year after the abolishment of border controls at the German-Polish and German-Czech border. As the graphics reveal, the overall number of criminal offenses in these regions amounted to 61 crimes per 1,000 inhabitants in 2006, and dropped slightly to 58 crimes per 1,000 inhabitants in 2008. Approximately one third of all crimes were crimes against property. When only considering these types of crimes, the rate increased from 22 crimes per 1,000 inhabitants in 2006 to 24 crimes per 1,000 inhabitants in 2008 in border regions.

As Figure 2 reveals, this increase is mainly driven by a rise in street crimes and criminal mischief, which are the most common types of crimes against property. The rate of burglary also marginally increased between 2006 and 2008, while the rate of both drug-related crimes and thievery from motor vehicles decreased in the border regions between 2006 and 2008.

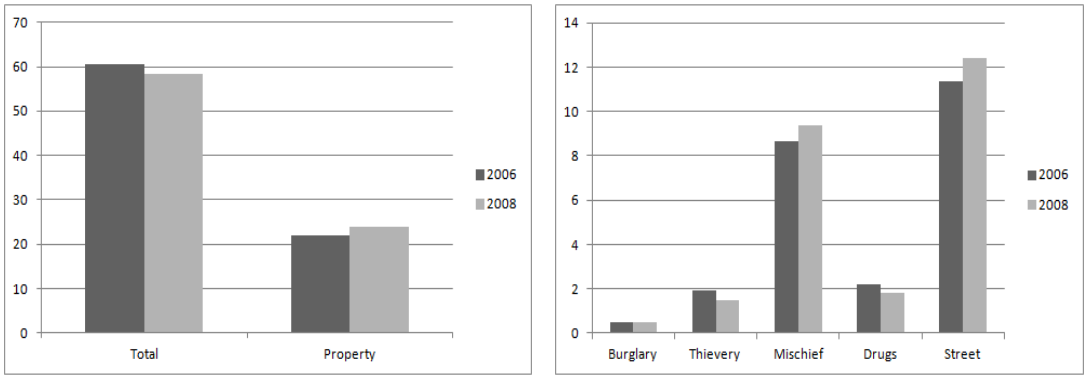

Figure 2: Crime Rates in German Border Regions 2006 and 2008
Crimes per 1,000 inhabitants in border regions. Data are obtained from the German Police Crime Statistics (Bundeskriminalamt, 2007 and 2009).

The descriptive evidence in Figures 2 shows that overall, there is no noticeable increase in criminal offenses in border regions between 2006 and 2008, i.e. the years prior to and following the Schengen Treaty in Poland and the Czech Republic. Yet the description only reveals the naive effect, i.e. the difference between crimes in border regions before and after the abolishment of border controls.[6] This effect, however, does not say anything about how the rate of criminal offenses in border regions would have developed had Poland and the Czech Republic not joined

[5]The five types of criminal offenses against property assessed in this article (i.e. burglary, thievery from motor vehicles, criminal mischief, street crime and drug-related crimes) encompass all types of crimes against property for which data on the county level is available in the German Criminal Police Statistics.

[6]The naive estimator is commonly given as $\delta = E(y_t|D = 1) - E(y_{t-1}|D = 0)$, whereby y_t is the outcome (crime rate) in border regions in the post-Schengen period t in the presence of the Schengen Treaty, D=1, and y_{t-1} is the outcome (crime rate) in border regions in the pre-Schengen period $t-1$ in the absence of the Schengen Treaty, D=0 (see, for example, Shadish *et al.*, 2002).

the Schengen Zone.

To identify the causal effect of the Schengen Treaty on border regions one would have to compare the crime rates in border regions in the period after the abolishment of border controls, i.e. $E(y_t|D = 1)$ with crime rates in border regions in the same period had the Schengen enlargement not taken place, i.e. $E(y_t|D = 0)$. However, the situation $E(y_t|D = 0)$, i.e. crime rates in border regions in the period after the abolishment of border controls had Poland and the Czech Republic not joined the Schengen Zone, is unobservable. To approximate the counterfactual situation, we use a statistical matching procedure. Statistical matching aims at controlling preexisting differences between the treatment and control group, so that units in the treatment group are similar or only randomly different from the units in the matched control group on all observed covariates $\mathbf{X}$ that may affect the outcome variable (Stuart and Rubin, 2008). In doing so, it satisfies the conditional independence assumption that requires that the border location B is not related to crime rates prior to the abolishment of border controls, when controlling for region-specific factors $\mathbf{X}$. Hence, any difference in $\mathbf{X}$ that is due to the border location B is ruled out. Consequently, crime rates are then independent from the border location given, i.e. $E(y) \perp B|\mathbf{X}$ (see Stuart and Rubin, 2008).

As the matching procedure, one-to-one nearest-neighbor propensity score matching without replacement is applied. Hence, each border region is matched to the non-border region (without replacement) that has a similar probability, i.e. propensity, of receiving the treatment, given the set of observed covariates $\mathbf{X}$ (see Rosenbaum and Rubin, 1983 or Stuart and Rubin, 2008 for details). Propensity score matching is chosen as the number of covariates that can impact regional crime rates is high and propensity score matching decreases the dimensionality of the set of potential covariates $\mathbf{X}$ on which border and non-border regions are matched (Rosenbaum and Rubin, 1983). However, there are also some drawbacks connected with propensity score matching: First, any matching procedure is only as good as the selection of the observables, i.e. the covariates used to calculate the propensity score. Hence, the selection of the covariates crucially determines whether the conditional independent assumption holds. Second, the determination of the propensity score requires a functional form assumption and, in turn, a parametric model. Yet, we think that the matching procedure we chose is very intuitive and transparent, as it explicitly clarifies the pairs of border and non-border regions that are compared. Furthermore, it avoids projections into empty space, as it satisfies the common support assumption, requiring that $0 < Prob(B = 1|\mathbf{X} = 1) < 1$ over the distribution of $\mathbf{X}$ (Stuart and Rubin, 2008). To satisfy this assumption, only border regions and their matched controls that

are on common support are included in the empirical analysis.[7]

The set of covariates $\mathbf{X}$, which are used to estimate the propensity scores of the German counties, contains several regional characteristics that are assumed to affect criminal activities within a county (see Section 2.1). In particular, the set includes the regional demographic composition, the regional economic performance, the regional level of educational attainment and the regional clearance rate. Data for the covariates are obtained from Eurostat (2016), the Cambridge Econometric Regional Database (2015), the INKAR data of the German Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR, 2016) and the German Police Crime Statistics released by the Federal Criminal Police Office (Bundeskriminalamt, 2005 to 2009). The propensity score is calculated by a logistic regression model that regresses the binary border variable on a set of regional control variables in 2006, i.e. the year prior to the implementation of the Schengen Treaty in Poland and the Czech Republic. The estimated coefficients for the likelihood of being a border region, i.e. treatment region, that is $P(B|X)$, are displayed in Table A.1 in the Appendix.

The final sample consists of 27 region pairs. Table A.2 in the Appendix lists the 27 border regions and their matched control regions. The list shows that most matched control regions are regions within the same Federal State. Out of the matched control regions, merely three regions (namely Demmin, Zwickauer Land and Hoyerswerda) are direct neighbors of border regions. Direct spatial spillover effects, should hence not greatly affect the results.

Table 1 shows that the matching procedure generates a balanced sample of treated regions, i.e. border regions, and control regions, ı.e. non-border regions, in terms of observed characteristics. Hence, the t-tests of the difference in variable means between treatment and control group show insignificant results in most cases, indicating that the matching procedure indeed eliminates observable differences between treatment and control groups in key regional characteristics. Only in the regional demographic composition, the level of education and the clearance rate do border regions and their matched controls differ statistically significantly. Hence, the share of people with university degree and the share of the population aged 18 to 30 is significantly higher in the matched control regions. In contrast, the clearance rate is significantly higher in the border regions. This may result from an increase in cross-border police cooperation and other measures designed to combate cross-border crime. Hence, the level of deterrence should be higher in border regions compared to their matched control regions that are not located at the border to Poland or the Czech Republic. In all other observed regional characteristics the

[7] Four border regions, namely Freyung-Grafenau and Wunsiedel in Bavaria and Görlitz and Niederschlesischer Oberlausitzkreis in Saxony are not on common support and are therefore excluded from the analysis.

Table 1: Descriptive Statistics Border Regions and Matched Control Regions[a]

	Border Regions	Matched Control Regions	$tp > \|t\|$	
Share < 6	4.58	4.54	-0.403	0.687
Share $6 < 18$	11.15	10.86	-1.1270	0.261
Share $18 < 25$	8.88	9.17	2.11	0.036**
Share $25 < 30$	5.40	5.59	1.716	0.088*
Share $30 < 50$	29.53	29.76	1.12	0.266
Share $50 < 65$	19.74	19.72	-0.08	0.935
Share $65 < 75$	12.18	12.04	-0.73	0.467
Share > 75	8.56	8.32	-1.451	0.148
Population Density	224.83	237.31	0.36	0.716
Share Foreigners	3.01	2.99	-0.077	0.937
Unemployment Rate	16.34	16.41	0.097	0.923
Youth Unemployment	12.51	12.77	0.836	0.404
Income per Capita	14936.23	14736.75	-1.087	0.278
GDP per Capita	20219.78	20641.52	0.42	0.676
Share Unskilled Labor	12.70	12.21	-0.80	0.427
Share University Degree	8.26	9.62	2.37	0.019**
Clearance Rate	64.75	62.98	-2.14	0.033**

[a] Column (1) report means for the years before the Schengen Treaty (2003-2006) in border regions (N=108); column (2) means for the years before the Schengen Treaty (2004-2006) in non-border regions (N=108). Column (3) reports the t-values of the test on the hypothesis that the mean values of each variable is the same in the treatment and control group. Column (4) shows that the differences in means are insignificant for almost all covariates.

mean values are the same in border regions and their matched control regions. The balance between treatment and control groups on the observed covariates suggests that the two groups will only randomly differ on all observable and unobservable background covariates (see Stuart and Rubin, 2008).

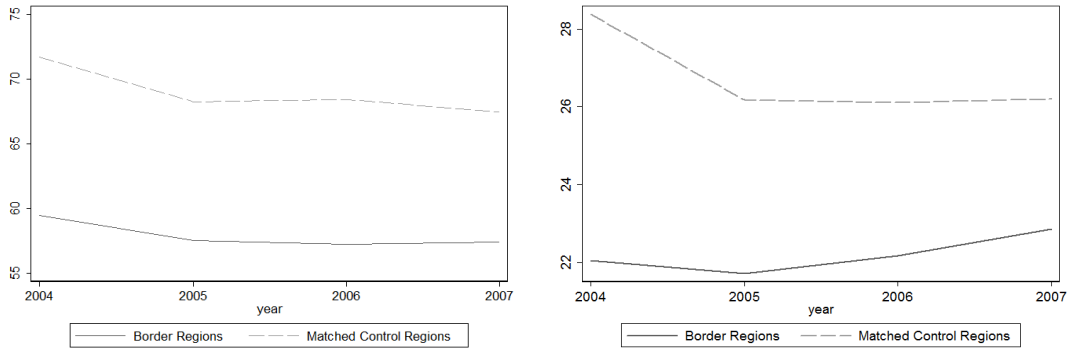

Figure 3: Overall crime rates (left graphics) and property crime rates (right graphics) in German border and matched control regions 2004 -2007. Data are optained from the German Police Statistic 2004 to 2007.

Moreover, Figure 3 shows that while crime rates in German non-border regions have constantly been higher compared to border regions, both border regions and their matched controls follow a common trend in the pre-treatment period, which satisfies the common trend assumption. Since crime data at the county level are not publicly available before 2004, a more thorough test of the common trend assumption is not possible. It is, hence, neither possible to conduct

long pre-treatment trend comparisons nor to conduct any pseudo-treatment test. However, as the graphs in Figure 3 depict, aggregated crime rates in border regions for the period from 2004 to 2007 and their matched controls are sufficiently similar. Controlling for several regional characteristics that potentially affect regional crime rates should further alleviate concerns regarding the validity of the common trend assumption (for similar empirical strategies, see, for example, Dustmann *et al.*, 2016, Braakmann and Vogel, 2010 or Gathmann *et al.*, 2014).

Besides our main analysis of crime rates in German counties, we include an estimation based on data from Austria for the years 2006 to 2011. For Austrian border counties, we used the same matching procedure as for Germany to identify comparable pairs. The set of covariates $\mathbf{X}$, which are used to estimate the propensity scores of the Austrian counties, are share of foreigners, share of people younger 25 years, share of people older 75 years, and total population on county (*Bezirk*) level, and GDP per capita, unemployment rate, and population density on state (*Bundesland*) level. For Austria data come from Eurostat (2016), the Austrian Statistical Office (Bundesanstalt Statistik Österreich) (2017) and the Austrian Federal Crime Police Office (Bundeskriminalamt Österreich, 2005 to 2016). The matching procedure identified 17 border counties and their matched pairs. The analysis for Austrian border counties plays a subordinate role in the overall analysis of effects of changes in border regimens on crimes, since the choice of available covariates for Austria is limited. Additionally, the Austrian data includes different crime categorizations than the German data. Only the category all crimes which sums the crimes over all categories is likely to be comparable in both countries. Similarly to Germany, in Austria the crime rates in border counties are lower than in their matched non-border pairs. However, the common trend assumption is also fulfilled in Austria, since border regions and matched controls show a common trend before 2008.

3.2 Estimating the Schengen Effect

Having identified suitable control groups, the Schengen effect on crime rates in border regions, i.e. the Average Treatment effect on the Treated (ATT), can be defined as the difference of the difference in crime rates prior to and after the Schengen Treaty between border and non-border regions, i.e.

$$\delta = [E(y_t - y_{t-1}|B = 1) - E(y_t - y_{t-1}|B = 0)],$$

whereby $E(y_t - y_{t-1}|B = 1)$ is the difference in crime rates prior to and after the Schengen Treaty in border regions and $E(y_t - y_{t-1}|B = 0)$ the difference in non-border regions. This

equation is also referred to as the conditional difference-in-differences (Schengen Effect) estimator (see Blundell and Costa-Dias, 2000 or Smith and Todd, 2005 for a detailed discussion). The corresponding linear difference-in-differences regression model estimated based on annual panel data for border regions and their matched control regions for the years 2004 to 2008 and for the years 2004 to 2012 as robustness check in Germany and for the years 2006 to 2011 in Austria can be formalized as:

$$y_{it} = \alpha_i + \beta_1 B_i + \beta_2 T_t + \beta_3 (B_i T_t) + \beta_4 \mathbf{X}_{it} + \epsilon_{it},$$

where y_{it} is the outcome of interest, i.e. the rate of criminal offenses of a certain type in region i at time t, α_i is the region-specific constant, B_i is a binary variable that takes the value 1 for border regions and 0 for non-border, β_1 captures the difference between border and non-border regions in the absence of the Schengen effect, T_{it} contains time dummies for year/years after the implementation of the Schengen Treaty in the eastern European EU countries, β_2 captures the corresponding coefficient, $\mathbf{X}_{it}$ is a matrix of regional available control variables and time dummies for the available years before the implementation of the Schengen treaty, β_4 is a vector of the corresponding regression coefficients, and ϵ_{it} is a standard error term. Finally, $B_i T_{it}$ is the interaction term of B_i and T_t that takes the value 1 for border regions in 2008 to 2012. The coefficient β_3 then measures the divergence in average outcomes between the border regions, i.e. treatment group, and non-border regions, i.e. control group, after the eastern EU countries joined the Schengen Zone, which indicates the Average Treatment effect of the Treated (ATT). This is the effect of interest, i.e. the Schengen effect.

The matching procedure outlined above contributes to the conditional independence assumption holding. Hence, it ensures that the difference before and after the treatment in the absence of the treatment are similar conditioned on the propensity of being a border region, P($\mathbf{X}$), that is expressed by the propensity score. Along with the conditional independence assumption, a second key initial assumption is the Stable Unit Treatment Value Assumption (SUTVA), requiring that potential outcomes of units are unaffected by the exposure to the treatment of other units (Rubin, 1980; Stuart and Rubin, 2008). This assumption, often referred to as the non-macro effect assumption, is more difficult to justify. Hence, the abolishment of border controls inevitably affected all German regions, not only regions located on the border to the two new Schengen member states. The identified effect can thus only be interpreted as the lower bond of the true effect.

To increase the efficiency of the estimates further, a set of regional covariates that may affect

crime rates within regions is included in the regression model. For Germany, the set of covariates includes the regional level of deterrence, indicated by the regional clearance rate in the various types of crime, and the regional economic performance, measured by the regional GDP per capita and the regional GDP growth rate. The regional population density is included as a further region-specific variable. As indicated above, these variables are frequently identified in the geography of crime literature as factors affecting the crime rate in a given region. Furthermore, we include year and state dummies to control for time-specific or region-specific effects. Data on all regional characteristics are again compiled from Eurostat (2016), the Cambridge Regional Econometrics Database (2015), the INKAR data of the German Federal Institute for Research on Building, Urban Affairs and Spatial Development (2016), and the German Police Crime Statistics of the Federal Criminal Police Office (Bundeskriminalamt, 2005 to 2009). For Austria we include the variables available on county (*Bezirk*) level (share of foreigners, share of people younger 25 years, share of people older 75 years, and total population). We also include year and state dummies. For Austria data come from Eurostat (2016), the Austrian Statistical Office (Bundesanstalt Statistik Österreich) (2017) and the Austrian Federal Crime Police Office (Bundeskriminalamt Österreich, 2005 to 2016).

4 Empirical Results

4.1 All Crimes in Germany

Table 2 depicts the estimated regression coefficients and the corresponding robust standard errors of the linear difference-in-differences regression model on matched samples for Germany for the years 2004 to 2008. The first model specification presents the results without the inclusion of any covariate, while the subsequent model specifications include region-specific covariates that are commonly identified as affecting crime rates at the regional level. The second model specification includes the regional clearance rate, while the third and fourth model specifications also include the regional economic performance and the regional population density.

The estimated coefficients in Table 2 show that the interaction term (Schengen effect), which constitutes the parameter of interest, is negative and not statistically significant in the first specification. This indicates that the number of crimes per 1,000 inhabitants in German regions on the border to Poland and the Czech Republic did not change in a statistically significant way compared to their non-border counterparts after Poland and the Czech Republic implemented the Schengen Treaty. The result stays the same when controlling for the regional clearance rate.

Table 2: Difference-in-difference estimates on matched sample for Germany: *All Crimes*[a]

	All Crimes	All Crimes	All Crimes	All Crimes
Schengen Effect	-1.396	-0.501	3.872	6.532
	(2.985)	(2.998)	(4.865)	(4.493)
Year=2008	-.403	-.406	-10.39*	2.947
	(1.706)	(4.640)	(4.620)	(4.768)
Border County	-2.032	-2.667	5.079	-15.76
	(16.29)	(15.78)	(16.12)	(13.64)
Clearance-Rate		.444	1.873	2.950*
		(1.931)	(1.481)	(1.165)
GDP per capita			.006**	.002
			(.002)	(.001)
GDP Growth			-361.9*	-202.5*
			(136.2)	(82.35)
Pop. Density				.166***
				(.044)
Yearly Dummies	√	√	√	√
Country Dummies	√	√	√	√
Constant	71.60***	46.2	-53.72	-401.6**
	(.731)	(114.8)	(112.0)	(119.9)
Observations	270	270	270	270
McFadden R^2	.061	.058	.370	.623

[a] Table entries denote estimated coefficients, robust standard errors (in parentheses) and the level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

When further controlling for the regional economic performance and the regional population density, the interaction term becomes positive, but stays statistically insignificant.

4.2 Crimes Against Property in Germany

Table 3: Difference-in-difference estimates on matched sample for Germany: *Property Crimes*[a]

	Property Crime	Property Crime	Property Crime	Property Crime
Schengen Effect	.760	.670	1.336	1.544
	(1.382)	(1.812)	(1.744)	(1.372)
Year=2008	-.184	2.366	-5.096*	-0.682
	(1.335)	(1.571)	(2.287)	(2.824)
Border County	-3.285	-4.123	-.483	-7.162
	(6.918)	(6.991)	(7.214)	(6.612)
Clearance-Rate		-.758**	-.296	.109
		(.252)	(.197)	(.119)
GDP per capita			.001*	.001
			(.001)	(.001)
GDP Growth			-124.8*	-69.40*
			(56.16)	(34.32)
Pop. Density				.064**
				(.019)
Year Dummies	√	√	√	√
Country Dummies	√	√	√	√
Constant	28.88***	53.04***	-57.73	-78.72*
	(.473)	(8.286)	(45.13)	(30.13)
Observations	270	270	270	270
McFadden R^2	.058	.140	.324	.552

[a] Table entries denote estimated coefficients, robust standard errors (in parentheses) and the level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3 depicts the estimated regression coefficients with the rate of crimes against property as the outcome variable. Crimes against property include burglary, thievery from motor vehicles, criminal mischief, drug-related crimes and street crimes, i.e. all types of crimes against property for which regional-level data are available. The interaction term, indicating the Schengen effect, is now positive, but still not statistically significant in all four model specifications suggesting that the Schengen Treaty has also not affected the rate of crimes against property in German border regions. The binary variables for the post-Schengen period and the border location are again not statistically significant, except for the specification that controls for the regional clearance rate and the regional economic performance. This indicates that crime rates in border regions and their matched control regions did not change before and after the Schengen Treaty in a statistically significant way, and that crime rates in border regions and their matched control regions did not differ during the entire observation period, i.e. from 2004 to 2008.

Tables 4 and 5 depict the estimated regression coefficients for various types of criminal offenses as the outcome variable. The findings show that the interaction term, indicating the Schengen effect, is not statistically significant for thievery from motor vehicles (Table 4), drug-related crimes (Table 4), criminal mischief (Table 5) and street crimes (Table 5). These results indicate that for these types of criminal offenses, the implementation of the Schengen Treaty and the subsequent abolishment of border controls at the Polish-German and Czech-German border did not affect crime rates in German border regions in a statistically significant way. However, the Schengen effect is positive and statistically significant for burglaries (Table 4), indicating that the Schengen Treaty and the subsequent abolishment of border controls indeed affected the number of reported burglaries per inhabitant in German regions on the border to Poland and the Czech Republic. In the baseline specification, i.e. the specification without any region-specific covariate, the estimated coefficient has a value of .496, which is difficult to interpret in terms of effect size. When taking the natural logarithm of crime rates as the dependent variable, the estimated regression coefficient amounts to .527, which indicates that because of the removal of border controls, crime rates in border regions increased by 52.7% compared to non-border regions, which is a comparatively large effect (see Table A.3 in the Appendix). The positive effect remains similar when controlling for region-specific covariates. This finding indicates that public concerns that the removal of physical barriers at the German-Polish and German-Czech border would increase crimes in border regions are not completely unjustified.

Table 4: Difference-in-Difference Estimates on Matched Samples for Germany - Various Types of Crime I*

	Burglary				Thievery from Motor Vehicles				Drug Related Crimes			
Schengen Effect	.496**	.529*	.544*	.556*	-.214	-.195	-.184	-.175	.237	.215	.226	.247
	(.183)	(.212)	(.210)	(.210)	(.377)	(.371)	(.363)	(.362)	(.274)	(.282)	(.320)	(.302)
Year=2008	-.441*	-.463*	-.510*	.493*	-.085	-.361	-.330	-.208	-.399*	-.644***	-1.399***	-1.186**
	(.187)	(.205)	(.201)	(.200)	(.254)	(.184)	(.290)	(.302)	(.183)	(.148)	(.344)	(.343)
Border County	-.106	-.115	-.040	-.169	-.249	-.254	.110	-.454	-.188	.230	.571	.116
	(.129)	(.135)	(.137)	(.113)	(.541)	(.549)	(.608)	(.493)	(.574)	(.569)	(.606)	(.497)
Clearance-Rate		.001	.001	.001		-.015	-.004	.001		-.098	-.089*	-.065
		(.001)	(.001)	(.001)		(.024)	(.017)	(.016)		(.051)	(.042)	(.043)
GDP per capita			.001*	-001			.001*	.001			.001*	.001
			(.001)	(.001)			(.001)	(.001)			(.001)	(.001)
GDP Growth			-1.246	-.220			-11.24*	-6.545			-9.810*	-6.263
			(1.191)	(.953)			(5.358)	(4.012)			(3.762)	(3.841)
Pop. Density				.001*				.004***				.003
				(.001)				(0.001)				(.002)
Year Dummies	√	√	√	√	√	√	√	√	√	√	√	√
State Dummies	√	√	√	√	√	√	√	√	√	√	√	√
Constant	1.135***	1.062***	-1.731	-2.108*	3.416***	4.189***	-7.912	-7.516	2.855***	12.49*	1.110	7.185*
	(.063)	(.073)	(1.120)	(.982)	(.117)	(.762)	(.4.653)	(4.038)	(.134)	(4.894)	(6.859)	(3.304)
Observations	270	270	270	270	270	270	270	270	270	270	270	270
McFadden R^2	.285	.286	.392	.446	.119	.120	.283	.367	.187	.199	.392	.458

* Table entries denote estimated coefficients, robust standard errors (in parentheses) and the level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Difference-in-Difference Estimates on Matched Samples for Germany - Various Types of Crime II*

	Criminal Mischief				Street Crime			
Schengen Effect	.115	-.005	.265	.407	.363	.131	.654	.900
	(.497)	(.543)	(.652)	(.530)	(.896)	(1.137)	(1.058)	(.875)
Year=2008	.315	.025	-.106	1.443	.027	-.564	-.657	-.660
	(.398)	(.525)	(.863)	(.962)	(.816)	(.828)	(1.680)	(.767)
Border County	-.009	-1.107	.854	-1.130	-2.922	-3.706	-1.533	-5.036
	(2.160)	(2.049)	(2.069)	(1.592)	(4.295)	(4.385)	(4.647)	(4.515)
Clearance-Rate		-.223	-.049	.081		-.495*	-.222	-.074
		(.128)	(.092)	(.087)		(.196)	(.192)	(.123)
GDP per capita			.001**	.001			.001*	.001
			(.001)	(.001)			(.001)	(.001)
GDP Growth			-41.37*	-20.49			-73.10*	-42.36
			(17.98)	(11.36)			(35.78)	(22.55)
Pop. Density				.022**				.035**
				(.007)				(.011)
Year Dummies	√	√	√	√	√	√	√	√
County Dummies	√	√	√	√	√	√	√	√
Constant	6.93***	12.94***	-27.15*	-30.75**	17.39***	28.64***	-33.22	-39.40
	(.157)	(3.183)	(13.35)	(10.34)	(.279)	(4.485)	(26.36)	(19.72)
Observations	270	270	270	270	270	270	270	270
McFadden R^2	.050	.080	.296	.569	.063	.117	.305	.512

* Table entries denote estimated coefficients, robust standard errors (in parentheses) and the level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Yet the results also reveal that the positive effect is mainly driven by a sharp decrease in burglaries in the matched control regions in 2008. As Figure 4 illustrates, the rates of burglaries sharply decreased in the matched non-border regions in 2008, whereas in border regions, the rate of burglaries slightly increased between 2007 and 2008. The negative coefficient for the border location dummy variable also depicts that border regions actually witnessed fewer burglaries per 1,000 inhabitants than their non-border matched controls in the entire observation period. The negative and statistically significant effect for the 2008, i.e. post-Schengen, dummy reveals that the rate of burglaries decreased after the Schengen Treaty in border regions and their matched controls.

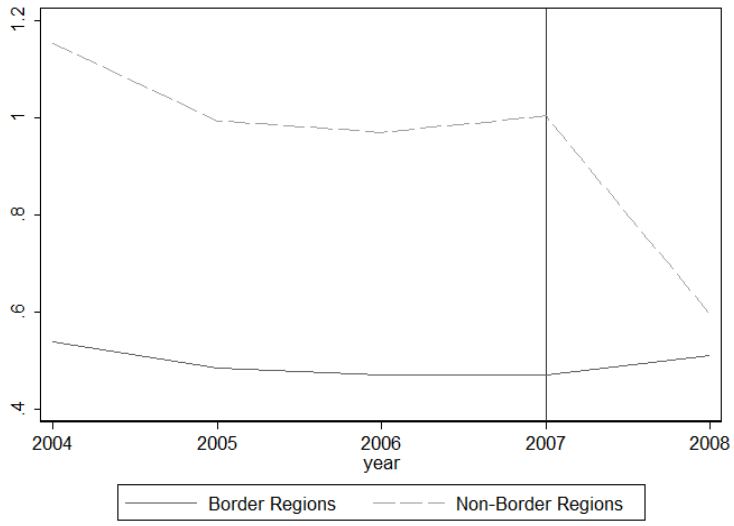

Figure 4: Rate of Burglaries in German Border Counties and Matched Non-Border Counties 2004 - 2008. Number of reported burglaries per 1,000 inhabitants.

4.3 Including Additional Years in Germany

To investigate the Schengen Effect on crimes in border regions in the medium-run, we expand the estimation until 2011 including three more post years than in the previous estimations. To include these additional three years we have to exclude counties in Saxony from the estimation because regional borders in Saxony changed in the course of local governmental reorganization. A final sample with 16 counties and their matched pairs remains for the robustness check. Table 6 presents the results for all types of crime for the specification which includes all control variables. Results show positive coefficients for four of the seven crime outcomes including All Crimes and Burglary. In particular, for All Crimes the coefficient is larger than in the main estimation. However, none of the coefficients is significantly different from a zero effect in

the robustness analysis. This leads to the conclusion that overall including more years in the analysis does not change the findings from the main estimations.

Table 6: Difference-in-Difference estimates on Matched Samples for Germany including Years until 2011 - Various Types of Crime

	All Crimes	Property Crime	Burglary	Thievery	Drug Related Crime	Criminal Mischief	Street Crime
Schengen Effect	10.67	1.866	0.535	-0.310	-0.114	0.379	1.352
	(5.979)	(1.389)	(0.270)	(0.658)	(0.437)	(0.700)	(0.705)
Post-Schengen	-12.54*	-5.353**	-0.744**	-1.414***	-1.021*	0.100	-3.283**
	(5.441)	(1.771)	(0.264)	(0.368)	(0.411)	(0.606)	-1084
Border = 1	0.702	3.812	-0.174	0.467	1.010	1.777	2.319
	(13.05)	(5.213)	(0.205)	(0.778)	(1.079)	(1.943)	(2.861)
Clearance-Rate	3.801**	0.131	0.004	-0.000	-0.089*	0.094	0.155
	(1.256)	(0.142)	(0.004)	(0.0123)	(0.036)	(0.105)	(0.124)
GDP per capita	0.004	0.001	0.000	0.000	0.000	0.000	0.001
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP Growth	-260.2*	-83.40*	-0.727	-7.351	-8.198	-30.84	-44.40*
	(99.31)	(39.56)	(1.306)	(4.246)	(5.683)	(16.22)	(20.35)
Pop. Density	0.115*	0.043	0.001	0.003	0.003	0.016	0.023*
	(0.056)	(0.021)	(0.001)	(0.002)	(0.003)	(0.009)	(0.0107)
Year Dummies	√	√	√	√	√	√	√
State Dummies	√	√	√	√	√	√	√
Constant	-176.0	16.63	0.817*	2.103	8.929**	1.113	10.16
	(88.93)	(12.30)	(0.347)	(1.575)	(3.027)	(5.473)	(6.952)
Observations	256	256	256	256	256	256	256
Adjusted R-squared	0.652	0.614	0.303	0.346	0.378	0.545	0.652

* Table entries denote estimated coefficients, robust standard errors (in parentheses) and the level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.4 Effects on Austrian Border Counties

As Germany is not the only country sharing a border with the new Schengen member states this section analyses the effects of the Schengen Treaty on Austrian border counties including a time period from 2006 to 2011. Table 7 shows that most of the coefficients are positive but small in magnitude and statistically insignificant. Only the crime type Burglary or Armed Theft increases significantly after implementation of the Schengen Treaty. Although this category is not completely comparable with the German outcome Burglary, it is interesting that in both countries crimes related to Burglary appear most influenced by the Schengen Treaty. Overall, the results for Austrian border counties are in line with the results from German border counties showing that also in Austria crime rates just slightly increased after the abolishment of border controls.

Table 7: Difference-in-Difference Estimates on Matched Samples for Austria - All Types of Crime *

	All Crimes	Theft	Aggravated Theft	Burglary or Armed Theft	Commercial or Criminal Org. Theft	Predatory Theft	Robbery	Aggravated Robbery
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Schengen Effect	0.433	-0.189	0.029	0.570*	0.034	0.003	-0.018	0.000
	(0.721)	(0.583)	(0.039)	(0.283)	(0.058)	(0.005)	(0.016)	(0.005)
Border County	-0.945	-0.532	-0.034*	-0.294	-0.091	0.001	0.005	-0.003
	(1.230)	(0.800)	(0.019)	(0.524)	(0.076)	(0.005)	(0.011)	(0.007)
Post Schengen	-2.260***	-1.958***	0.003	-0.240	-0.106**	-0.002	0.041*	0.005
	(0.592)	(0.372)	(0.025)	(0.294)	(0.051)	(0.004)	(0.023)	(0.005)
Share Foreigners	1.927***	1.171***	0.048***	0.601**	0.088***	0.004***	0.010**	0.006*
	(0.549)	(0.333)	(0.014)	(0.228)	(0.023)	(0.001)	(0.004)	(0.003)
Population Total	-0.000	-0.000	-0.000	0.000*	-0.000***	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Share younger 25	0.000	0.000	0.000*	-0.000	0.000***	0.000	0.000	-0.000
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Share older 75	-0.001	-0.000	-0.000*	-0.001*	-0.000	0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year Dummies	√	√	√	√	√	√	√	√
State Dummies	√	√	√	√	√	√	√	√
Constant	11.025	8.168*	0.267	2.274	0.243	-0.015**	0.019	0.053
	(7.780)	(4.763)	(0.228)	(2.583)	(0.298)	(0.007)	(0.035)	(0.049)
Observations	204	204	204	204	204	204	204	204
R-squared	0.55	0.51	0.47	0.58	0.42	0.14	0.12	0.40

* Table entries denote estimated coefficients, robust standard errors (in parentheses) and the level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5 Discussion and Conclusion

This article has assessed whether the implementation of the Schengen Treaty and the subsequent changes in border regimes at the border of Germany and Austria to their eastern neighbors in December 2007 affected crime rates in German and Austrian regions which border an eastern EU country based on annual panel data. Effects were identified by conditional difference-in-differences estimation on matched samples. This approach allows the identification of the Schengen effect on crime rates in border regions in a causal way. Results show that no significant Schengen effect can be observed for overall crime rates. However, for the rate of burglaries, the data reveal a positive and statistically significant effect in Germany and Austria, indicating that for burglaries, public concerns about an increase in crime following the Schengen Treaty proved to be true. For Germany, the identification strategy, however, also shows that the effect is primarily driven by a sharp decline of burglaries in the matched control regions instead of a sharp increase of burglaries in border regions. Moreover, results reveal that for other, more common types of criminal offenses, including criminal mischief, street crime, thievery out of motor vehicles or drug-related crimes, the abolishment of border regions had virtually no effect on crime rates in German and Austrian border regions.

One potential explanation why crime rates did not increase may be that the risk perception and anticipated benefits of criminal activities in German and Austrian border regions have not changed for potential offenders from the East after border controls were abolished. This may be the case, as the implementation of the Schengen Treaty has been accompanied by an increase in cross-border police cooperation and information exchange. Another explanation may be the reinforcement of police presence in the immediate border regions once border controls were eliminated. In fact expenditures to the police increased, for example, in all four German Federal States bordering either Poland or the Czech Republic from 2006 to 2008. However, the increased rate of burglaries supports public concerns that the abolishment of border controls would increase crime. Public concerns may be reinforced by the fact that burglaries are one of the most feared types of criminal offenses (Hirtenlehner and Hummelsheim, 2015). Indeed, in a survey conducted by the German Police Crime Office in 2014, the fear of burglaries ranked even above the fear of robbery or rape among the German public (Hirtenlehner and Hummelsheim, 2015). This may explain the public concerns revealed, despite the fact that compared to other types of criminal offenses, the number of burglaries per 1,000 inhabitants in border regions is quite low and increased only slightly between the pre-Schengen and post-Schengen period in these regions.

Because people are highly concerned of burglaries, public authorities might do well to counteract these kind of criminal activities in border regions more intensively. This would also signal political awareness, which may decrease public concerns and the drift of voters in border regions to populist or even nationalist parties that exploit public fears. At the same time, the empirical results show that for other types of criminal offenses such as street crime, thievery of motor vehicles, criminal mischief or drug-related crimes, the Schengen Treaty had virtually no effect on crime rates in German or Austrian border regions. In light of the prevailing xenophobic tendencies especially in East German border regions, the current discussion on the future of the Schengen Zone and the U.S. Mexican border, this is a relevant result, because it shows that there is only little empirical support for the widespread concerns about public security in border regions.

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A Appendix

A.1 Logistic Regression for Propensity Scores

Table A.1: Logistic Regression Model[a]

Border Location	
Share $<$ 6 Years	-10.917
	(10.503)
Share 6 $<$ 18 Years	-10.271
	(10.315)
Share 18 $<$ 25 Years	-11.001
	(10.479)
Share 25 $<$ 30 Years	-11.045
	(10.283)
Share 30 $<$ 50 Years	-10.775
	(10.330)
Share 50 $<$ 65 Years	-10.270
	(10.368)
Share 65 $<$ 75 Years	-10.674
	(10.331)
Share $>$ 75 Years	-10.548
	(10.354)
Population Density	-.001
	(.002)
Share Foreigners	-.220
	(.203)
Umemployment Rate	.143
	(.115)
Youth Unemployyment	.143
	(.160)
Income per capita	.001
	(.001)
Share Unskilled Labor	.211
	(.174)
Share University Degree	.357**
	(.163)
Clearance Rate	.184**
	(.049)
Constant	1051.072
	(1034.203)
Observations	428
McFadden's R^2	.385

[a] Table entries denote regression coefficients of a logistic regression model. Dependent variable: border region. Stars denote significance of the estimates as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.2 Border Regions and Matched Controls

Table A.2: Border Regions and Matched Control Regions

Border Regions		Matched Control Regions	
Regen	(DE229)	Altenburger Land	(DEg0m)
Weiden i. d. Opf. kreisfreie Stadt	(DE233)	Dingolfing-Landau	(DE22c)
Cham	(DE235)	Dessau-Roßlau, kreisfreie Stadt	(DEe01)
Neustadt a. d. Waldnaab	(DE237)	Suhl, kreisfreie Stadt	(DE04)
Schwandorf	(DE239)	Ostprignitz-Ruppin	(DE416)
Tirschenreuth	(DE23a)	Rügen	(DE80h)
Hof, kreisfreie Stadt	(DE244)	Eichsfeld	(DEg06)
Hof, Landkreis	(DE249)	Bernkastel-Wittlich	(DEb22)
Frankfurt (Oder), kreisfreie Stadt	(DE411)	Demmin	(DE808)
Barnim	(DE412)	Darmstadt, kreisfreie Stadt	(DE711)
Märkisch-Oderland	(DE413)	Jena, kreisfreie Stadt	(DEg03)
Oder-Spree	(DE415)	Haßberge	(DE267)
Uckermark	(DE418)	Sömmerda	(DEg0d)
Cottbus, kreisfreie Stadt	(DE422)	Rottal-Inn	(DE22a)
Spree-Neiße	(DE429)	Güstrow	(DE809)
Ostvorpommern	(DE80f)	Döbeln	(DEd33)
Uecker-Randow	(DE80i)	Kyffhäuserkreis	(DEg0a)
Plauen, kreisfreie Stadt	(DEd12)	Bitburg-Prüm	(DEb23)
Annaberg	(DEd14)	Hoyerswerda, kreisfreie Stadt	(DEd23)
Freiberg	(DEd16)	Weimar, kreisfreie Stadt	(DEg05)
Vogtlandkreis	(DEd17)	Leipziger Land	(DEd34)
Mittlerer Erzgebirgskreis	(DEd18)	Zwickauer Land	(DEd1c)
Aue-Schwarzenberg	(DEd1b)	Muldentalkreis	(DEd35)
Bautzen	(DEd24)	Torgau-Oschatz	(DEd36)
Löbau-Zittau	(DEd28)	Nordhausen	(DEg07)
Sächsische Schweiz	(DEd29)	Riesa-Großenhain	(DEd27)
Weißeritzkreis	(DEd2a)	Saalfeld-Rudolstadt	(DEg0i)

A.3 Effect Size of the Schengen Treaty on the Rate of Burglaries

Table A.3: Difference-in-Difference Estimates on Matched Samples for Germany: Effect Size Burglaries[a]

	Log Burglary	Log Burglary	Log Burglary	Log Burglary
Schengen Effect	.527**	.506*	.530*	.545**
	(.191)	(.200)	(.200)	(.198)
Year=2008	-.425*	-.411*	-.474*	.454*
	(.179)	(.185)	(.182)	(.181)
Border County	-.291	-.285	-.201	-.353*
	(.183)	(.185)	(.174)	(.153)
Clearance Rate		-.002	.001	.002
		(.002)	(.002)	(.002)
GDP per capita			.001**	.001
			(.001)	(.001)
GDP Growth Rate			-1.890	-.687
			(1.130)	(.882)
Pop. Density				.001*
				(.001)
Yearly Dummies	√	√	√	√
State Dummies	√	√	√	√
Constant	.065	.111	-2.995**	-3.314***
	(.046)	(.066)	(1.093)	(.880)
Observations	270	270	270	270
McFadden R^2	.337	.336	.457	.524

[a] Table entries denote estimated coefficients, robust standard errors (in parentheses) and the level of significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Dependent variable: Log rate of burglary