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Essays in Applied Economics

Ekaterina Travova

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Abstract

The first chapter investigates the use of high-powered incentives for civil servants in the public sector by analyzing possible manipulations of drugs seized by Russian police. First, using a bunching estimator, I document a significant excess mass of heroin cases above the punishment threshold. Next, combining the bunching with an event study framework, I study the incentives for police officers to manipulate, and find evidence consistent with the motivation arising from officers' performance evaluations. Further negative consequences of inappropriate incentives are inequality in the enforcement of law and prolonged sentences for offenders.

The second chapter investigates the influence of the Orthodox Church network in Post-Soviet Russia on individual political preferences and election results. I use the numbers of monks and nuns from Orthodox monasteries operated in the Russian Empire before the Revolution as historical religious markers to construct a Bartik-style instrument. I find that a denser Church network increases the average local approval rating for the current president and the share of votes cast for the government candidate in presidential elections. Further analysis of mechanisms shows that, today, the extending Church network is increasingly less able to attract people to attend church and to substantially increase the share of practicing believers. However, it does affect the political preferences of those who, regardless of their faith in God, self-identify as Orthodox. The potential channel for persuasion is media.

The third chapter (jointly with Andreas Menzel and Christoph Koenig) studies the long-run effects of personal experience of work-life disruption during the transition period in the 11 former communist CEE countries on life satisfaction and political left-right orientation. We implement an instrumental variable strategy, constructing an instrument which captures the potential exposure of a person to the country-wide sector-specific disruption shock. We find a significant negative impact of transition disruption on current life satisfaction, which is stronger for men without university degree. We also identify a number of negative long-run effects on marital status, perceived control over life, and some health outcomes (likelihood of drinking and smoking). Further, we document that a career disruption during the transition period tends to shift the political orientation to the right side of the left-right scale.

Abstrakt

První kapitola zkoumá využití vysoce účinných pobídek pro státní zaměstnance ve veřejném sektoru pomocí analýzy možných manipulací s drogami zabavenými ruskou policií. Za prvé, pomocí hromadného odhadu dokumentuji značný přebytek případů heroinu nad hranicí trestu. Dále, v kombinaci s rámcem studie událostí, studuji pobídky pro policisty k manipulaci a nacházím důkazy konzistentní s motivací vyplývající z hodnocení výkonu policistů. Dalšími negativními důsledky nevhodných pobídek jsou nerovnosti ve vymáhání práva a prodloužené tresty pro pachatele.

Druhá kapitola zkoumá vliv sítě pravoslavné církve v postsovětském Rusku na individuální politické preference a volební výsledky. Počty mnichů a jeptišek z pravoslavných klášterů provozovaných v Ruské říši před revolucí používám jako historické náboženské značky ke konstrukci nástroje ve stylu Bartíka. Zjistil jsem, že hustší církevní síť zvyšuje průměrné místní hodnocení souhlasu pro současného prezidenta a podíl hlasů odevzdaných vládnímu kandidátovi v prezidentských volbách. Další analýza mechanismů ukazuje, že dnes je rozšiřující se církevní síť stále méně schopná přilákat lidi k návštěvě kostela a podstatně zvýšit podíl praktikujících věřících. Ovlivňuje však politické preference těch, kteří se bez ohledu na svou víru v Boha identifikují jako pravoslavní. Potenciálním kanálem pro přesvědčování jsou média.

Třetí kapitola (společně s Andreasem Menzelem a Christophem Koenigem) studuje dlouhodobé dopady osobní zkušenosti s narušením pracovního a soukromého života během přechodného období v 11 bývalých komunistických zemích CEE na životní spokojenost a politickou levo-pravou orientaci. Implementujeme instrumentální variabilní strategii, konstruujeme nástroj, který zachycuje potenciální expozici osoby celostátnímu sektorově specifickému narušení šoku. Zjišťujeme významný negativní dopad narušení přechodu na současnou životní spokojenost, která je silnější u mužů bez vysokoškolského vzdělání. Identifikujeme také řadu negativních dlouhodobých účinků na rodinný stav, vnímanou kontrolu nad životem a některé zdravotní důsledky (pravděpodobnost pití a kouření). Dále dokumentujeme, že přerušení kariéry během přechodného období má tendenci posunout politickou orientaci na pravou stranu levo-pravé škály.

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Introduction

This thesis consists of three chapters that fall under the broad banner of Applied Economics.

In the first chapter, I investigate the use and consequences of high powered incentives in the public sector. The tradeoff between motivating civil servants and distorting their behavior has long been a central issue of incentives design. Increasingly, the literature documents a negative effect of high-powered performance-related incentives in the public sector. Nevertheless, these incentives are still commonly used across bureaucracies in many countries. A particularly notable example of such countries is Russia. A recently published report on drug crimes (Knorre 2017) illuminates revealing statistics on the distribution of criminal cases across quantities of heroin seized. These statistics suggest the bunching of offenders who were arrested with an amount of heroin just above the threshold sufficient to be convicted of a more serious crime. At the same time, there is a missing mass of cases just below the threshold. This might be evidence of manipulation of drug quantities seized by police, which moving offenders from below to above the threshold.

The first chapter provides an empirical analysis of the mechanism that drives the possible manipulation of amounts of drugs seized, using a unique dataset that contains rich information on drug crimes reported in Russia during 2013-2014. Applying bunching techniques and comparing two drug control agencies with different evaluation approaches which operated in Russia during the period, I show that these manipulations are triggered by the performance evaluation of police officers, which nudges them to present some

particular number of more severe cases by the end of each year. I also identify further consequences of the inappropriate incentives: inequality in the enforcement of law, and prolonged sentences. The results suggest that individuals with a prior criminal history are more likely to have their amounts of drugs seized manipulated by police. The overall effect of this manipulation on sentence length is an additional year of incarceration, which is not dependent on a guilty plea. Thus, using Russia as an example, this chapter raises a concern about the ever-increasing use of performance-related incentives in the public sector by showing their distorting effect in an environment where manipulations are ex ante less expected.

The second chapter investigates the political influence of Church. In many countries, religion still plays a significant role in different life spheres, despite official separation of Church and state. Scholars have documented the significant and, in many cases, mixed effects of religion on education, health, pro-social behavior, innovation, economic growth and other areas. At the same time, as identified by (Iyer 2016) in his recent survey of economic literature on religion, the relationship between religious beliefs, the Church as an Institute, and politics remains currently understudied. A particular question which needs scholarly attention is the nation-building role of the Church, and how the influence of Church is utilized by politicians to gain wide public support and to remain in power.

In the second chapter, I explore this question by analyzing the impact of the expanding Orthodox Church network in Post-Soviet Russia (measured by the regional density of Orthodox organizations) on individual political preferences and election results. I apply an instrumental variable strategy, constructing a Bartik-style instrument. The instrument is based on a contemporary country-wide shock to the Russian Orthodox Church (ROC) network scaled for each region with the historical regional density of monks and nuns living in Orthodox monasteries in the Russian Empire in 1908, before the Revolution. The results suggest that a denser Church network increases the average local approval rating of the current president and bolsters the share of votes for the government candidate in presidential elections. Further analysis of mechanisms shows that, today, the extending Church network is increasingly less able to attract people to attend church and to substantially increase the share of practicing believers. However,it does influence the political preferences of those who, regardless of their faith in God, self-identify as Orthodox. The potential channel for persuasion is media.

The third chapter (jointly with Andreas Menzel and Christoph Koenig) studies the long-run effects of personal experience of work-life disruption during the transition pe-

riod on life satisfaction in the 11 former communist countries, and investigates how this could translate into the influence on political left-right orientation. The rise of populist sentiments, movements, and parties in Central and Eastern Europe (CEE) over the past decade, which are challenging existing liberal democracies, has been attributed to a number of different reasons, including employment instability from the transition to a market economy after the fall of the communist regimes in 1989-91. However, evidence on how personal experiences during the transition period in CEE affect current day attitudes remains scarce.

In the third chapter, we investigate this question using the large-scale SHARE survey data. Our core independent variable of interest is the share of persons in the local industry sector of a given respondent, whose work history was disrupted during the transition years 1989-1995. Using this share instead of personal unemployment status allows us to capture a wider range of effects triggered not only by a respondent's own job loss, but also by the experience of seeing colleagues losing their job, of long-term fears of losing one's own job, and of management changes and downsizing at one's employment site. To identify causal relationships, we implement an instrumental variable strategy. We construct an instrument which presents the potential exposure of a person to a country-wide, sector-specific, transition period disruption shock. We find a significant negative impact of transition-era disruptions on current life satisfaction, which is stronger for men without university degree. We also identify a number of negative long-run effects on marital status, perceived control over life, and some health outcomes (likelihood of drinking and smoking) which potentially present the mechanisms behind the effect on life satisfaction. Furthermore, we document that a career disruption during the transition period tends to shift the political orientation to the right side of the left-right scale.

Chapter 1

Under Pressure? Performance Evaluation of Police Officers as an Incentive to Cheat: Evidence from Drug Crimes in Russia

1.1 Introduction

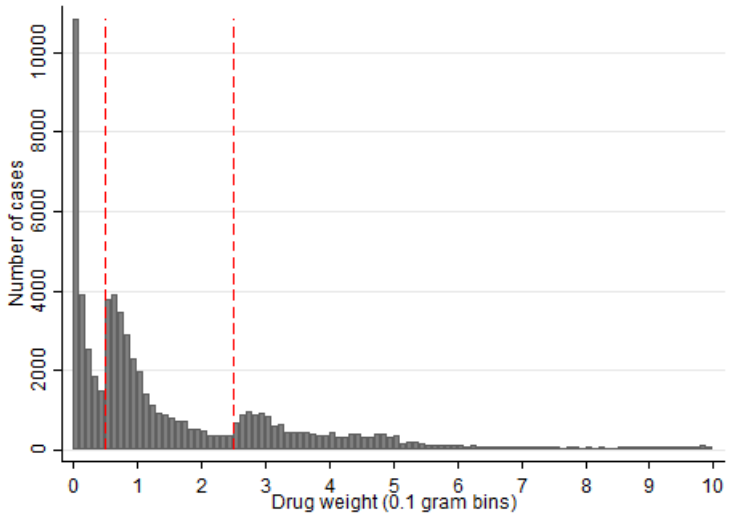
For decades, scholars have been investigating the relationship between incentives and effort. Nevertheless, there is still no clear understanding of how to effectively motivate civil servants in a non-market environment. While weak incentives are mostly inefficient, high-powered performance-related incentives could be inappropriate in some government jobs resulting in negative effects. As was highlighted in the seminal paper by Holmstrom and Milgrom (1991), many civil servant's jobs are characterized by multitasking. At the same time, some objectives that civil servants have to attend to are more easily measured than others. In such a situation, strong incentives could detract attention away from tasks that are not easily measured, or even induce fraudulent behavior.

Nevertheless, the use of high-powered incentives tailored to easily measurable and quantifiable indicators is a common practice across bureaucracies in many countries. Thus, for example, the distorting effect of these incentives is documented for teachers (Jacob and Levitt 2003; Jacob 2005), doctors (Alexander 2020), government officials (Fisman and Wang 2017) and law enforcers (Mas 2006; Ash and MacLeod 2015; Makowsky, Stratmann, and Tabarrok 2019; Acemoglu et al. 2020). In this paper, I study the effect of strong incentives on the behavior of police officers resulting in substantial manipula-

tions of the amounts of drugs seized from offenders in Russia in the 2013-2014 period. I also investigate further consequences of the inappropriate incentives: inequality in the enforcement of law, and prolonged sentences.

Russia, a notable example in this context, provides a natural laboratory for investigating the use of incentives in the public sector. Figure 1.1, obtained from Knorre (2017), shows the distribution of heroin cases across drug quantities seized in Russia during the 2013-2014 period. Two dashed lines indicate the threshold drug amounts that define three classes of the severity of the drug possession offences, and accordingly the punishment[1]. The Figure reveals a striking pattern suggesting that, at the moment of arrest, many people possess a drug amount just above a threshold beyond which they will be convicted of a more serious offence. In addition, there is a missing mass of cases just below the thresholds. This phenomenon is suggestive of manipulations of the drug quantities seized by the police, moving offenders from below to above the thresholds.

Figure 1.1: Distribution of cases across quantities of heroin seized in Russia during 2013-2014



Note: The baseline sample consists of all heroin related cases registered in Russia during 2013-2014. The thresholds (dashed lines) determine the scale of seizure (less than significant, significant and large drug amounts), the severity of crime and punishment. This graph replicates Figure 5 in (Knorre 2017).

In the paper, I discuss why the observed discontinuities are rather due to manipulations with drug amounts than due to the self-selection of offenders or differential enforcement by the police around the cutoff. In addition, I present anecdotal evidence that these manipulations were more likely in the form of increasing the actual drug weights,

[1]There is also a third threshold (at 500 grams for heroin) that is not depicted on the graph.

not merely changing the numbers in documents (Subsection 1.4.1). While the paper's results and conclusions do not depend on the exact method of manipulating, knowing that planting drugs on offenders may occur and may be relatively costless is important for further policy making.

To study the incentives for possible manipulations, I exploit the specific feature of the Russian institutional context, namely, the existence of two drug control agencies, which were similar in many aspects but had different performance evaluation approaches. Thus, in order to set incentives, one of the agencies compared the performance of its officers within each station over time so that the most recent performance would not be worse than previously. Therefore, the target - the number of severe cases that should be reported by the end of the year - was always known to officers, thus making incentives to manipulate clearer and stronger. In contrast, the other agency used the performance comparison across stations, and officers could only forecast the target that they should reach based on their performance and that of other officers in previous years. Using a standard bunching estimator and an event study approach and comparing two agencies, I show that the observed patterns in the distribution of drug related cases and in the behavior of police officers over the year are consistent with them being driven by the performance evaluation systems[2].

The use of "targets" and "benchmarks" resulting in adverse effects is not specific to Russian police and could be observed in police performance evaluation in other post-Soviet states as well as some developed countries such as the UK, France, Australia and the US (Eterno and Silverman 2019; Ossei-Owusu 2021). Even though most countries officially renounced the use of statistics-based incentives, informally, this approach is still widely implemented by many supervisors of local stations.

In the second part of the paper, I identify further negative consequences of the inappropriate incentives: inequality in the enforcement of law and prolonged sentences. Adopting the novel bunching technique from Diamond and Persson (2016), I investigate the characteristics of victims of manipulations of seized drug amounts and estimate the effect of the manipulation on sentence length. The results suggest that while the demographics and socio-economic status of offenders do not have a significant effect on a police officer's decision to manipulate, having a criminal history increases the probability

[2]It is worth noting that bribery may be another motive for police officers to manipulate the drug amounts, or to threaten offenders with possible manipulation. This is discussed in more detail in Subsection 1.4.2.

of becoming a victim of such manipulation. In contrast, Volkov (2016) analyzes all felony cases processed by Russian federal district courts during the 2009-2013 period and finds a significant bias in judges' decisions against entrepreneurs and offenders of low socio-economic status. Kurmangaliyeva (2017) determines that the Russian judicial system is more lenient towards wealthier defendants.

The overall estimated effect of the manipulation on the sentence length of drug users (who constitute almost 70% of all manipulated offenders) is around one additional year of incarceration. This is an almost 67% increase on the average sentence length (1.5 years) without manipulation. In addition, I estimate that there were around 3000 offenders moved above the threshold as a result of manipulation during the 2013-2014 period. These estimates allow me to discuss the total social cost of applying the inappropriate incentive structure in the public sector. Although this cost is difficult to calculate precisely, the welfare loss from prolonged sentences and inequality in the enforcement of the law likely outweigh any benefits from keeping drug users off the streets. I also find that the manipulation increases the probability of pretrial detention by 9%, but it does not affect the probability of pleading guilty and the lengths of investigation and adjudication.

This paper adds to the still scarce but growing literature on performance evaluations and incentive schemes in the public sector. In law enforcement, studying the effect of various policies on the behavior of agents is particularly important because occasionally it becomes a matter of life and death. For example, Acemoglu et al. (2020) investigate the use of high-powered incentives for the military in Colombia and find that rewarding army members for killing guerillas (left-wing insurgents) significantly increases the number of false positives when innocent civilians are killed and misrepresented as guerillas. This is an extreme example of an adverse response to poorly designed incentives in a highly consequential setting, similar to drug manipulations in Russia investigated in my paper. Nevertheless, these studies broaden the empirical evidence and also provide general insights useful for policy making in other settings.

The manipulation of the drug quantities seized by the Russian police is widely discussed in various media reports[3]. There are also some descriptive studies (Paneyakh 2014; Knorre 2017) and more quantitative analysis of the distribution of drug related cases (Skougarevskiy 2017; Knorre 2020). However, these papers do not test for the possibility that the incentive structure used by law enforcement agencies induces the fraudulent behavior. Thus, this study addresses this gap by presenting a rigorous analysis of possible

[3]For example, see Nadezhdin and Matveeva (2019), Merzlikin (2019), Antonov (2019).

drug manipulation and the mechanism behind it. Using Russia as an example, it raises a concern about the ever-increasing use of performance-related incentives in the public sector by showing their distorting effect in an environment where manipulations are ex ante less expected. Additionally, in contrast to previous studies, this paper takes a step further and analyzes the consequences of inappropriate incentives in low enforcement.

Among studies on incentives in law enforcement, there is a range of papers that focus on incentives arising from various punishment thresholds. The response to these thresholds may come from two sides: offenders who might strategically bunch below the thresholds (Traxler, Westermaier, and Wohlschlegel 2018; Lepage 2020), and law enforcers who might want to adjust the punishment for some offenders around the thresholds (Anbarci and Lee 2014; Goncalves and Mello 2017; Bjerk 2005; Ulmer, Kurlychek, and Kramer 2007; Rehavi and Starr 2014; Bjerk 2017). I focus on the latter case and, in contrast to most existing studies, analyze a setting in which law enforcers behave in a more repressive way, intentionally increasing, instead of decreasing, the penalty for the offender[4].

Similar to this study, Tuttle (2019) also finds the bunching of drug offenders above the punishment threshold. However, using U.S. data he comes to a different conclusion as to why the bunching occurs, which highlights my results in an interesting way. Thus, in contrast to my paper, Tuttle (2019) documents that the observed excess mass of drug offenders is due to prosecutorial discretion: prosecutors may use legal tools to move offenders above the threshold if they believe these offenders deserve a harsher punishment. Additionally, Tuttle (2019) finds bunching only for crack-cocaine traffickers, whereas I document bunching for both heroin users and sellers. In general, the main focus of his paper is on racial discrimination, while this study adds to the scarce literature on the negative consequences of strong incentives in the public sector of countries where race and ethnicity play a lesser role in defining social status.

The rest of this paper is organized as follows. Section 1.2 describes the institutional context and data. In Section 1.3, I provide the empirical strategy, and in Section 1.4, I

[4]Anbarci and Lee (2014) and Goncalves and Mello (2017) use U.S. data on speeding tickets and find an excess mass at speeds just below the first threshold, above which the fine increases. They take this bunching as evidence of manipulation by police officers, who may wish to avoid onerous punishment for drivers. Bjerk (2005), Ulmer, Kurlychek, and Kramer (2007) and Rehavi and Starr (2014) find that some prosecutors are more likely to charge offenders who were initially arrested for crimes under a mandatory minimum sentencing law with a lesser crime not covered by this law. Bjerk (2017) focuses on drug crimes in the US and finds that first-time drug offenders are likely to avoid prosecution under a mandatory minimum law.

present the results. Section 1.5 contains concluding remarks.

1.2 Institutional Context and Data

This section briefly discusses the institutional background, providing information on Russian anti-drug laws and the system of performance evaluation for police officers. Additionally, it describes the dataset used for the empirical analysis.

1.2.1 Institutional Context

The first independent Russian anti-drug agency was established in 2002. Since then it has been reorganized multiple times, and in 2004 was renamed the Russian Federal Service for Drug Control (FSKN)[5], also known as the "Drug Police". The responsibilities of this agency included the control of legal, and combat of illicit drug trafficking, and prevention of drug abuse. The FSKN shared jurisdiction with the Public Security Service (Police) of the Ministry of Internal Affairs (MVD)[6], but was solely responsible for coordinating and pursuing Russian drug investigations abroad (The Ministry of Internal Affairs of the Russian Federation, n.d.). While the main focus of the FSKN officially was on larger cases (drug trafficking, organized crime, large drug amounts), the MVD mostly dealt with routine low-profile cases, such as drug use and small-quantity drug sales. At the same time, the MVD provided many other public security functions, and drug control was not its only responsibility.

Both agencies were highly centralized and had similar structures with three levels of authority: federal at the level of the country, regional at the level of regions[7], and local at the level of municipal districts (*raions*)[8] and some of the cities. In the case of the MVD, there could be further subdivision of police stations in large municipal districts and cities. In 2013-2014, there were around 750,000 MVD police officers and 36,000 FSKN officers, which reflected the number of drug-related cases registered by these two agencies: almost two thirds of them were initiated by the MVD.

Even though the MVD and FSKN were supposed to have different drug control strategies, in practice, their efforts were duplicative in many aspects (Knorre and Skougarevskiy

[5]Federal'naya sluzhba Rossiiskoi Federacii po kontrolyu za oborotom narkotikov, FSKN.

[6]Ministerstvo vnutrennih del Rossiiskoi Federacii, MVD.

[7]In 2013, there were 83 regions. After the annexation of Crimea in 2014, the number of regions increased to 85.

[8]In 2013, there were 1,815 districts, in 2014 - 1,833.

2015). Table 1.1 in Appendix 3.A presents some summary statistics for the MVD and FSKN. Even though almost all differences in parameters are statistically significant, not all of them are economically significant. Thus, the compositions of drug types seized by the agencies were similar with the prevalence of heroin and cannabis group drugs (marijuana, hashish, and others) in both the MVD and FSKN. While the average seizure weight in the case of the FSKN was much greater than in the case of the MVD, the FSKN seized large drug amounts very rarely, and median seizure sizes for the two agencies were around 5 grams. In addition, the typical offender and the composition of punishment types were also quite similar across the two agencies. In 2016, the FSKN was dissolved, and its functions were transferred to the MVD.

Anti-drug legislation. 95% of all drug crimes registered in Russia in 2013-2014 were prosecuted under articles 228 and 228.1 of its Criminal Code. The severity of a penalty under these articles depends on the type of drug offence (drug use or drug sale) and on the amounts of drugs seized, which are classified via threshold amounts as "significant", "large" or "especially large" (Appendix 1.B, Tables 1.2 and 1.3). According to the law, the drug quantity seized is determined not by the weight of the pure drug substance but by the weight of the entire mixture. Therefore, if a police officer seizes, for example, one gram of heroin mixed with two grams of sugar, it will be considered as three grams of heroin.

Punishment for drug possession of a "significant" amount, with no intention to sell, is imprisonment for up to three years. For "large" and "especially large" amounts, the punishment is imprisonment for three to ten and ten to fifteen years, respectively. In the case of voluntary surrender of drugs to a police officer and active assistance during the investigation, an offender is exempted from criminal liability. If the amount of drug seized is less than significant, the person can only be brought to administrative responsibility punished with a fine up to \$142[9] or administrative arrest for up to fifteen days.

Drug sale is punishable by imprisonment for four to eight years if the amount is less than "significant", eight to fifteen years for a "significant" amount, and ten to twenty years for a "large" amount. "Especially large" amounts carry a fifteen to twenty years, or life, sentence. In this case, the crime is serious if the amount of drug seized is less than "significant", and most serious if the amount is "significant" or higher.

The practice of plea bargaining was introduced in 2001. Pleading guilty significantly

[9]All amounts are expressed in U.S. dollars using the average 2013-2014 exchange rate (RUB/USD = 35.158).

simplifies the procedure: a conviction is pronounced without the actual examination of evidence at a court hearing. In addition, a person that accepts a plea bargain waives the right to appeal. In return, by pleading guilty the offender lowers the upper bound of the sentencing range by one third. According to (Titaev and Pozdnyakov 2012), in general, pleading guilty in Russia does not reduce the sentence significantly and even worsens the offender's situation in some cases. Nevertheless in 2013-2014, almost 60% of all cases (30% of drug related offences) were processed under a plea agreement. This quite large share could be explained by the legal illiteracy of offenders who simply do not know how the plea bargain may influence their legal situation. Additionally, police officers could offer the agreement more forcefully if the credibility of evidence collected is in doubt as in the case of, for example, manipulation of drug amounts.

The performance evaluation of anti-drug agency personnel. During the 2013-2014 period, when both the FSKN and the MVD were responsible for enforcing drug laws, each had their own officers' performance evaluation system.

The system used by the FSKN was based on performance indicators that, among others, included the number of serious and most serious drug crimes (per 100 officers). At the end of each year, for each indicator, the FSKN regional offices received a position in cross-region ratings. The final evaluation was determined by the overall rank of the office in relation to other offices based on these ratings. Regional subdivisions (stations) at the level of municipal districts or cities were not competing with each other. However, they could receive unofficial guidance from their regional supervisors regarding the approximate level of performance indicators that should be targeted. This translated further into individual-level instructions for officers within each station.

In contrast to the FSKN, the MVD stations, individually and together as a whole regional office, compared their performance indicators, including the number of serious and most serious drug crimes (per 100 officers), with their own numbers in the previous year. At the end of each year, they had to show positive dynamics[10] (Novikova 2014). In order to do that, station supervisors assigned monthly, or sometimes even daily, "plans" (targeted levels of performance indicators) to each officer.

If the officer met or surpassed the targets, s/he might receive a monetary bonus to his or her monthly salary or promotion (for high-profile cases). While there was no guarantee

[10]Formally, after the reforms in 2011, the MVD offices had to use an overall score calculated by the complicated formula and to compare their performance across units rather than relative to the previous period. However, locally this did not work due to the complexity of the system.

that the officer would be rewarded for good performance, s/he certainly was reprimanded, warned or even fired in the case of unsatisfactory performance. In addition, the officer could be deprived of monthly bonuses, in addition to the fixed salary, if s/he did not fulfill the plan. The FSKN officers faced a similar rewards and punishment system; however, the definition of "satisfactory" and "unsatisfactory" performance was more vague there than in the MVD. In both agencies, decisions to reward or punish were made by immediate superiors at each level.

Thus, both systems of performance evaluation presented strong incentives for police officers to show the required level of cases and prosecutions in an environment where the manipulation of drug amounts, mainly in the form of planting drugs, was (and still is) relatively costless for police officers due to the specific rules applied to weighing the drugs seized. Even more, in Russia, police officers are rarely punished for the falsification of evidence[11] (Nikonov 2020) because the law enforcement system does not want these cases of police misconduct to be made public and thus harm its reputation.

Meanwhile, even though the FSKN's performance evaluation system was more transparent, it was more difficult for the FSKN stations to set the "necessary" amount of manipulations, since it had to take into account the performance of other stations in the current period. In contrast, the MVD officers always knew what numbers they should reach. These institutional features could significantly contribute to the difference in the magnitudes of manipulation by these two agencies, which I investigate in more detail in Subsection 1.4.2.

In addition, not only police officers were evaluated based on easily measurable and quantifiable indicators, but also prosecutors and judges. The evaluation of the prosecutors was linked to the number of convictions, while acquittals were considered "lost" cases and negatively affected the evaluation. Judges were evaluated by the number of appeals and by the "confirmation rate" of their decisions at the higher-instance courts (Schultz, Kozlov, and Libman 2014). This system incentivizes prosecutors and judges to behave in a repressive way[12] and created an enabling environment for fabricating cases at the lower level.

[11]For example, during the 2013-2014 period, only 72 police officers were convicted of the falsification of evidence. 14 of them were released from punishment (Nikonov 2020).

[12]In 2018, the rate of acquittal reached its historic minimum in post-Soviet Russia - 0.24% compared to 0.3-0.4% in the 1990s (Sokolov 2019).

1.2.2 Data

This paper uses a database provided by the Institute for the Rule of Law at the European University at St. Petersburg, Russia[13]. It contains information on almost 300,000 drug crimes reported in Russia during 2013-2014. The information is based on five forms that are created at the different stages of the investigation of a specific case and include the following data:

form 1: identified crime and investigation results;

form 2: socio-economic characteristics of offender;

form 3: criminal proceedings;

form 4: reparation for damages and the seizure of crime objects;

form 6: trial results[14].

Knorre and Skougarevskiy (2015) and Skougarevskiy (2017) extracted and analyzed all information on primary drug types, weights of drugs seized, offenders' characteristics and court decisions from this database. I follow their approach. Both forms 1 and 4 contain information on weights of drugs seized, which coincide only for 92.8% of cases. However, the distributions of cases across drug amounts do not differ significantly. Form 1 quantities are determined by a police officer, who has to weight the drug seized, while form 4 is created at a later stage after the prosecutor's approval of case initiation and contains drug amounts measured in the laboratory. Therefore, to estimate the magnitude of possible manipulation, and to investigate to what extent it varies by drug type, article and agency, I use data from form 1. In order to identify characteristics of victims of manipulation, I merge data from forms 1 and 2. For the investigation of manipulation consequences, I turn to combined data from forms 1, 2 and 6, merged with drug weights from form 4. Weights from both forms are needed for estimating LATE of manipulation on sentence length in accordance with the Diamond and Persson (2016) approach. I restrict the sample to cases related only to drug use for two reasons. First, separation by article is needed due to the existing specifics of determining the length of imprisonment for different types of crime. Second, the drug dealers sample from merged dataset based

[13]Initial data was compiled and prepared at the Institute for the Rule of Law at the European University at St. Petersburg with support from the Russian Science Foundation grant 17-18-01618.

[14]Form 1 is completed by an investigator when s/he decides to initiate criminal proceedings that should be approved by a prosecutor. During the investigation, forms 2, 3 and 4 are created. These forms have to be checked by the prosecutor's office before referring the case to the judicial authorities. Form 5 is not in the database since it should contain information on victims, while drug crimes are victimless. Form 6 is filled in by a judge. After closing the case, all forms should be converted from written to electronic form and submitted to an information center (Shklyaruk and Skougarevskiy 2015).

on forms 1, 2, 6 and 4 contains an insufficient number of observations for bunching techniques.

The initial dataset based on form 1 contained data on 518,979 drug crimes including 89,152 heroin cases. 14% of cases related to heroin were excluded from the sample because the amount of drug seized was missing[15]. Missing values are likely to be caused either by inaccurate completion of forms by police officers or by mistakes during the conversion of the forms into electronic files. Additionally, under some circumstances, a case can be initiated without drug seizure. See Table 1.4 in Appendix 1.B for more information on the samples discussed in this paper and missing values. While differences in means of the working sample and the set of observations with missing weights are statistically significant for almost all factors, their values themselves are small in most cases. As expected, the documents are more complete for more serious crimes (with longer sentences), when there is conclusive evidence (being arrested under the influence of drug) or in the case of refusing to plead guilty, which leads to a full investigation, compared to the simplified procedure under the plea bargain.

1.3 Empirical Strategy

1.3.1 Detecting Manipulation of Seized Drug Amounts

To study the magnitudes of possible manipulation in the data, I apply the standard bunching estimator (Saez 2010; Chetty et al. 2011; Kleven and Waseem 2013). This method allows to construct a measure of excess mass of offenders above a threshold by comparing actual and counterfactual distributions around this threshold. The counterfactual density of seized drug amounts is estimated by fitting a high-order polynomial to the observed distribution, excluding the manipulation region (see Appendix 1.C for further details).

In this study, I focus solely on the second threshold for several reasons. I do not study the first threshold because data on offences below the threshold could be incomplete due to police officers' reluctance to deal with cases that do not affect their performance evaluation significantly. Moreover, some officers might show leniency towards minor offences and not register them. In addition, the number of weight bins that could be defined

[15]The form 4 dataset included information on 236,989 drug crimes out of which 50,782 were related to heroin. Due to missing drug weight, 8% of heroin related cases were also excluded from the analysis.

below the first threshold is insufficient for estimating the counterfactual distribution. At the third threshold (500 grams for heroin), which is not presented in graphs, bunching is not observed, probably due to weak incentives and (or) insufficient number of observations. Therefore, I do not explore the police officers' responses to this threshold, and even exclude the long tail from the analysis, since it does not affect the counterfactual distribution around the relevant (second) cut-off and estimates.

If we assume that offenders are rational agents we could expect a counterfactual distribution with humps just below the thresholds. In this case, the bunching estimator yields a lower bound of the extent of manipulation. However, the voluntary bunching of offenders below the threshold is more likely to be observed if punishment increases discontinuously for any amount exceeding the limit (Traxler, Westermaier, and Wohlschlegel 2018; Lepage 2020). By Russian anti-drug law, in the counterfactual world without manipulation, the punishment should increase smoothly without shifts at the thresholds in the case of drug use or overlap in the case of drug sale. Therefore, I make the assumption of the counterfactual distribution with a smoothly decreasing shape[16].

Using the bunching estimator, I estimate the magnitude of manipulation in the full sample with the drug weights from form 1. To check that the results are insensitive to the choice of estimation parameters, I repeat the procedure described in Appendix 1.C, using different polynomial orders, values of upper bounds, or starting points after the exclusion of the area around the first threshold. I also vary the upper point for drug weight where I cut the sample since the long tail with few observations does not contain much information. Next, I compare magnitudes of manipulation across different samples, geographical areas, types of offence and drug control agencies.

Additionally, in order to analyze the effect of performance requirements on the behavior of police officers in more detail, I use an event study approach. The identification strategy exploits the variation in the timing of reaching the previous year's number of serious and most serious crimes for a given station. This approach restricts the sample to those police stations that during 2014 surpassed their 2013 "benchmark" (conditional on it not being zero). For each station i, I calculate the total number of serious and most serious drug crimes per month and, comparing these values with the 2013 level, determine when the station reached this level. This allows me to define a set of event study

[16]Indirect evidence in support of a smoothly decreasing shape comes from the distributions of cases related to the other types of drugs (Appendix 1.A, Figure 1.1), which do not have bunching (at least around the second threshold).

dummies with index t in [-5, 5] indicating the number of months before/after the event - the reaching of the "benchmark". In total, I have 11 dummies: 1 for the event month, 5 for pre- and 5 for post-periods, since, on average, stations reach the level needed between July and August. The inverse hyperbolic sine transformation (IHST) of monthly number of serious and most serious drug crimes Y_{ir} is my main outcome, which I regress on event study dummies and station (γ_i) and month (δ_r) fixed effects:

$$Y_{ir} = \sum_{t=-6}^{6} \alpha_t \mathbb{1}[T_{ir} = t] + \gamma_i + \delta_r + \varepsilon_{ir}. \tag{1.1}$$

I then test for whether there is a significant difference in the effects of reaching the previous year level for two drug control agencies separately and by the period of reaching (during the first, second or third 4 months of the year).

1.3.2 Identifying Victims of Manipulation

In order to recover the characteristics of those who were manipulated by the police, I adopt the technique designed by Diamond and Persson (2016). As in the part with the bunching estimator, I cut the sample at 0.8 gram from the left and at 10 grams from the right.

First, I estimate the counterfactual expected values of observable characteristic Y at any drug quantity bin R inside the manipulation area if there was no manipulation, using cases outside of this area:

$$Y_j = \sum_{k=0}^{p} \beta_k R_j^k + \varepsilon_j, \tag{1.2}$$

where $R_j < \overline{D} - r_l$ or $R_j > \overline{D} + r_u$. Then I can calculate the observed average values of characteristic Y for offenders inside the manipulation region below ($\overline{Y}^{never}$) and above ($\overline{Y}^{up}$) the threshold $\overline{D}$:

$$\overline{Y}^{never} = \frac{1}{N^{never}} \sum_i Y_i, \text{ where } \overline{D} - r_l \leq r_i < \overline{D}, \tag{1.3}$$

$$\overline{Y}^{up} = \frac{1}{N^{up}} \sum_i tY_i, \text{ where } \overline{D} \leq r_i \leq \overline{D} - r_u. \tag{1.4}$$

Here $\overline{Y}^{never}$ is the average characteristic of those offenders who were arrested with

the amount of drug just below the threshold and were not selected for manipulation ("never-takers"):

$$\overline{Y}^{never} = \frac{N^{down}}{N^{down} - N^{compliers}}\overline{Y}^{down} - \frac{N^{compliers}}{N^{down} - N^{compliers}}\overline{Y}^{compliers}. \tag{1.5}$$

Accordingly, $\overline{Y}^{up}$ is the average characteristic of all those offenders who were manipulated ("compliers") and who actually were arrested with a drug amount just above the threshold ("always-takers"):

$$\overline{Y}^{up} = \frac{N^{always}}{N^{always} - N^{compliers}}\overline{Y}^{always} - \frac{N^{compliers}}{N^{always} - N^{compliers}}\overline{Y}^{compliers}. \tag{1.6}$$

Using the estimates of the counterfactual values of observable characteristic $\hat{Y}$ and distribution of cases $\hat{C}$, I can obtain values of $\overline{Y}^{down}$ and $\overline{Y}^{always}$ in the following way:

$$\overline{Y}^{down} = \frac{\int_{\overline{D}-r_l}^{\overline{D}-\sigma} \hat{Y_j}^R \hat{C_j}^R dR}{N^{down}} \tag{1.7}$$

$$\overline{Y}^{always} = \frac{\int_{\overline{D}}^{\overline{D}+r_u} \hat{Y_j}^R \hat{C_j}^R dR}{N^{always}}. \tag{1.8}$$

The number of offenders in each part of the manipulation region can be calculated as:

$$N^{never} = N^{down} - N^{compliers}, \text{ where } N^{down} = \int_{\overline{D}-r_l}^{\overline{D}-\sigma} \hat{C_j}^R dR, \tag{1.9}$$

$$N^{up} = N^{always} + N^{compliers}, \text{ where } N^{always} = \int_{\overline{D}}^{\overline{D}+r_u} \hat{C_j}^R dR. \tag{1.10}$$

Plugging these into (5) and (6) and using estimates from (3), (4), (7) and (8), I solve for the compliers' average value of characteristic Y:

$$\begin{aligned}\overline{Y}^{compliers} = 0.5(&\frac{N^{never}}{N^{never} - N^{down}}\overline{Y}^{never} - \frac{N^{down}}{N^{never} - N^{down}}\overline{Y}^{down})+ \\ &+ 0.5(\frac{N^{up}}{N^{up} - N^{always}}\overline{Y}^{up} - \frac{N^{always}}{N^{up} - N^{always}}\overline{Y^{always}}).\end{aligned} \tag{1.11}$$

Finally, I can compare the mean characteristics of those offenders who were manipulated by the police ("compliers") with the mean characteristics of all offenders who were

"eligible" for manipulation but did not receive it ("never-takers"):

$$\Delta Y = \overline{Y}^{never} - \overline{Y}^{compliers}. \tag{1.12}$$

1.3.3 Estimating the Effect of Manipulation on Sentence Length

I identify the effect of manipulation of drug quantities on sentence length (and on the probability of pleading guilty) in two steps, following again Diamond and Persson (2016). As in the part with the bunching estimator, I cut the sample at 0.8 gram from the left and at 10 grams from the right.

First, I estimate the relationship between sentence length S and the amount of drug seized from form 1:

$$S_j = \sum_{k=0}^{p} \beta_k R_j^k + \gamma_R * \mathbb{1}[R_j \geq \overline{D}] + \omega_j, \tag{1.13}$$

where $R_j < \overline{D} - r_l$ or $R_j > \overline{D} + r_u$. Equation (13) gives the expected length of sentence at each drug amount inside the manipulation region in the counterfactual world where no offender is manipulated.

Then, I calculate the counterfactual expected sentence length across the whole set of drug offenders inside the manipulation region:

$$\overline{S} = \int_{\overline{D}-r_l}^{\overline{D}+r_u} \hat{S}_j \frac{\hat{C}_j{}^R}{\int_{\overline{D}-r_l}^{\overline{D}+r_u} \hat{C}_j{}^R} dR. \tag{1.14}$$

Comparing observed and estimated counterfactual average sentence lengths, I obtain the "intent-to-treat" effect, which shows a change in the length of imprisonment due to the offender having been caught with the actual amount of drug that falls within the manipulation region:

$$ITT = \frac{\sum_{i \in manip\, region} S_i}{N^{manip}} - \overline{S}, \tag{1.15}$$

where N^{manip} is the number of offenders in the manipulation area.

The procedure described above is repeated with drug quantities from form 4 instead of sentence length. This constitutes the effect of being manipulated on the amount of drug seized that is determined officially at the laboratory and then considered by judge

at court. The ratio of ITT from (15) to this effect, in turn, identifies the local average treatment effect (LATE) of being manipulated on the length of imprisonment.

1.4 Results

1.4.1 Manipulation of Seized Drug Amounts

The observed discontinuity in the distribution of heroin cases around the second threshold is likely due to manipulations with drug amounts seized from offenders. While it is quite difficult to completely rule out the alternative story of differential treatment by police officers around the threshold, there are some arguments supporting the hypothesis of manipulation. First, there is anecdotal evidence, various media reports and personal stories posted on online forums[17] document that planting drugs is a widely-used method in Russia to fabricate evidence. Second, there are no incentives for police officers to focus particularly on offenders who are just above the second threshold and ignore those, who are further to the right. The same logic applies to the hole in the distribution directly below the threshold: the offenders just below the second threshold are as "valuable" to police as other offenders who are further to the left (but above the first threshold). In addition, the performance evaluation of police officers also depends on the total number of all criminal cases solved during the year, not only serious and most serious ones. Therefore, police officers are motivated to "keep" every offender above the first threshold for further evaluation.

Among all drugs in my data, focusing on the second threshold, I find significant bunching only in the case of heroin. Graphs with distributions of other often seized drugs are in Appendix 1.A, Figure 1.1, and do not show such discontinuities. An explanation for this could be that it is less costly for police officers to manipulate heroin amounts, given the small quantities needed to cross the threshold and the possibility to use any non-drug white powder for planting on an offender. In contrast to other drugs in the form of white powder (cocaine, desomorphine, amphetamine), heroin was much more popular in Russia in 2013-2014. At the same time, it was one of the most harmful and addictive drugs which made users an easy target for police officers.

For example, in an interview, one of former policemen (Nadezhdin and Matveeva 2019) describes the following scheme often used by the police officers. The police station

[17]For example, see (Nadezhdin and Matveeva 2019), (Merzlikin 2019), (Antonov 2019).

receives a call from somebody reporting that at the hall of his or her building there are drug users, under the influence of drugs. The police arrives and finds unconscious people and an amount of, for example, heroin. If the drug quantity is below the threshold, the officers could add flour, sugar or any other white powder to arrest the users for a more severe crime[18]. This moves offenders from below to above the threshold adding points to police officers' performance evaluation.

The bunching estimator for all heroin cases from form 1 is 6.325 (Appendix 1.A, Figure 1.2). This means that the excess mass above the second threshold is almost six times greater than the average number of cases that would be in the manipulation window above this threshold in the counterfactual world without manipulation. The effect is slightly stronger in merged samples from forms 1 and 2 and forms 1, 2, 6, and 4 (Appendix 1.A, Figure 1.3), supporting the result observed in the initial dataset from form 1.

The result is robust to variations in the width of the manipulation window or the degree of the polynomial I use to fit the counterfactual distribution (Appendix 1.B, Table 2.7). To avoid the possible overstatement of the effect of manipulation, I choose the main specification yielding the results presented here that gives the smallest possible estimate of bunching.

Eyeballing the distributions of seized amounts of heroin in different Russian regions indicates that the magnitudes of manipulation vary across regions. However, formal test of differences in manipulations are infeasible, since splitting the sample into 83 subsamples (the number of regions) significantly reduces statistical power when estimating the region-specific extent of manipulation. Therefore, I divide all regions into only two groups: on, or away, from the main drug-trafficking routes[19]. Figure 1.4 in Appendix 1.A shows that the magnitude of manipulation in regions along the routes is more than twice as high as that in regions away from the routes. This could be explained by the following factors. First, in regions which are on the drug-trafficking routes, the share of population that could potentially be manipulated (drug users, drug dealers) is greater. Second, police officers in these regions might be more experienced in dealing with drug related crimes.

The following subsection investigates the observed pattern in the distribution of heroin related cases and its potential cause in more detail.

[18]This is possible because, according to the law, the drug quantity seized is determined not by the weight of the pure drug substance but by the weight of the entire mixture.

[19]Information on drug-trafficking routes is taken from the website of Russia's international news agency https://ria.ru/20100603/242406939.html. Accessed on December 1, 2018.

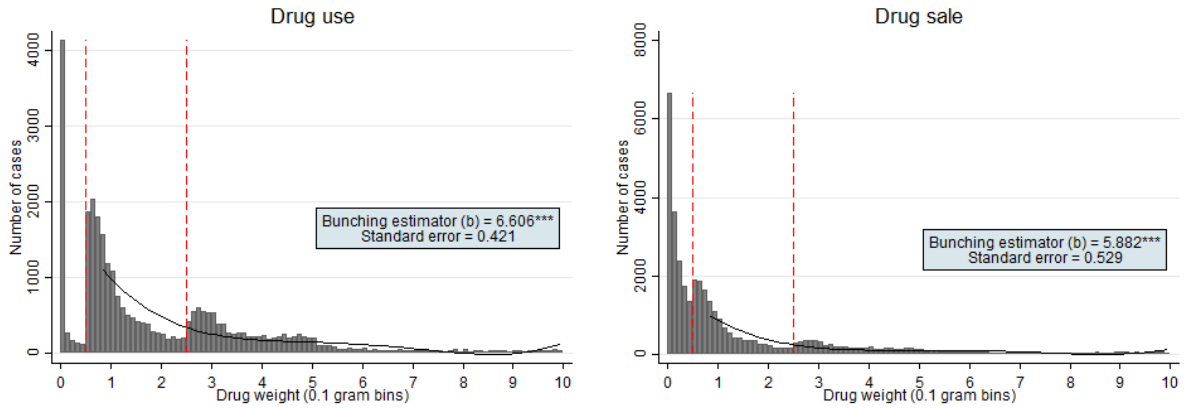
1.4.2 Incentives for Manipulation of Seized Drug Amounts

What causes the significant bunching above the threshold? According to, for example, Paneyakh (2014) and Knorre (2020), the main driving force for dishonest behavior is the system of performance evaluation of police officers. To test for this possibility, I exploit differences in the evaluation approaches of the two drug control agencies.

Combining the information on sanctions for drug related crimes and the systems of performance evaluation of police officers discussed in Subsection 1.2.1 suggests the following incentives for moving offenders from below the second threshold to above it. In the case of drug use, crossing the second threshold increases the severity of crime from least serious to serious, which in turn positively affects the evaluation. The incentive for moving offenders from below to above the threshold in the case of drug sale is ambiguous, since manipulation does not directly contribute to performance indicators. However, it could be explained by police officers' concern about losing "points" if a drug sale case is requalified to a drug use case (for example, storage without the purpose of sale). At the same time, if the drug amount seized is large (above the second threshold), a requalification only decreases the severity of the crime (from most serious to serious). However, that does not change the number of serious and most serious (drug) crimes solved by the police and, hence, does not worsen the performance statistics. Figure 1.2 presents a sharper graph and slightly higher bunching estimate for drug users (left) than for drug dealers (right), which could be explained by different incentives at the threshold. In addition, drug users are the significantly larger group of drug offenders, as well as much easier to locate and, hence, manipulate.

Moving offenders from below the threshold to above it increases the number of serious and most serious drug crimes solved, which improves the chances of police officers meeting the requirements. Since previous year's performance presents a direct target in the case of the MVD or more noisy benchmark in the case of the FSKN, reaching this level could significantly affect the behavior of the police during the current year. In order to analyze the possible influence, I implement an event study approach. In the analysis, I use data only on those stations that in 2014 reached their 2013 level of performance (conditional on it not being zero): these are around 38% of MVD stations and 33% of FSKN stations (Table 1.6, Appendix 1.B). At the same time, there were around 18% of MVD stations and 14% of FSKN stations that did not register any severe cases in the previous year and, therefore, had a zero target in 2014.

Figure 1.2: Distributions of cases related to drug use (left) and drug sale (right) across quantities of heroin seized

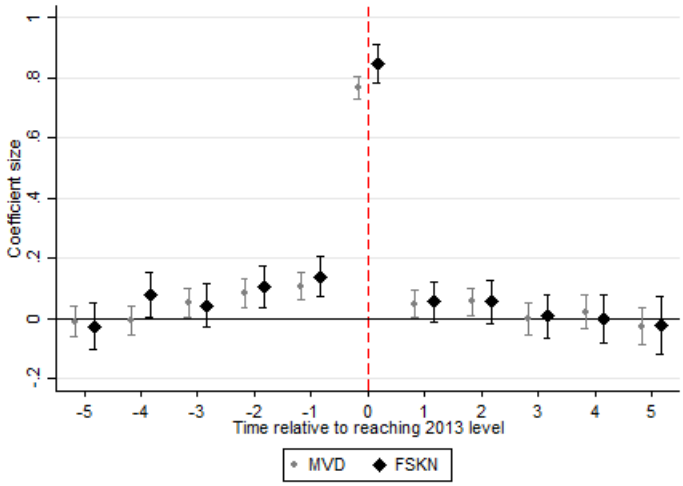


Note: The baseline sample consists of all heroin related cases from form 1 registered in Russia during 2013-2014. The series shown in bars is a histogram of the observed distribution of cases. The solid line is a fourth-degree polynomial fitted to the empirical distribution. The thresholds (dashed lines) determine the scale of seizure (less than significant, significant and large drug amounts), the severity of crime and punishment.

The regression results are shown in Figure 1.3 and Table 1.7 in Appendix 1.B. They suggest a common pattern for two agencies: a significant increase of the number of serious and most serious drug crimes registered in the month when the station reaches the 2013 benchmark and two months before it. After the "event", number of cases returns to its average level before the jump. This is consistent with the idea that manipulation is risky, and when the target is still far away, it is unclear whether benefits from manipulation will overweight its costs. However, the closer the target, the clearer the gain from manipulating drug amounts is. Once the target is reached, police officers stop manipulating, also because they do not want to ratchet up the target for the next year.

The slightly greater jump in estimates of the event month effect for the FSKN could be explained by the difference in the evaluation approaches of the two agencies. The FSKN offices use their previous year's performance only for some guidance while competing with each other. In contrast, the MVD stations follow exactly the target being, at the same time, more constrained by a possible ratchet effect. Figure 1.5 in Appendix 1.A and Table 1.8 in Appendix 1.B support this idea. While in both agencies, the previous year's numbers of severe cases are higher for stations that reached these numbers later in the year, the MVD stations have similar event study estimates regardless of the time of reaching the target. Stations that reached their 2013 performance level later in the year might have a higher natural inflow of severe cases by the time of reaching. Therefore,

Figure 1.3: The effect of reaching 2013 level on the number of serious and most serious drug crimes registered 2014



Note: The samples include all MVD and all FSKN stations that reached the total 2013 number of serious and most serious drug crimes during the period studied (January - December 2014). The regression results are reported in Appendix 1.B, Table 1.7. Standard errors are clustered by station.

following the target exactly and, at the same time, avoiding the ratchet effect, they do not "jump" higher in the event month than other stations as would be expected otherwise.

Turning to other stations - those that had zero previous year's level and those that did not reach their non-zero previous year's levels - I calculate mean monthly numbers of serious and most serious drug related offences registered by these stations in 2014. The results presented in Figure 1.6 in Appendix 1.A suggest that stations of both the MVD and FSKN behave in a similar way. However, the motivation behind this behavior could differ in the two agencies due to the difference in the performance evaluation approaches. Thus, the MVD stations with zero 2013 level register a low number of severe cases in 2014, because they do not have any incentives to increase the numbers that will become their direct targets next year. The MVD stations that did not reach their previous year's performance level register a slightly higher number of cases per month than the station that did reach the targets. Furthermore, they do not increase effort by the end of the year because their targets are too far away (Table 1.6, Appendix 1.B). In the case of the FSKN, stations do not directly target their previous year's performance but rather compete with each other. Therefore, stations with a zero 2013 level do not improve their performance in 2014, because, probably, they anticipate that in any case they will be unable to reach the top of the ranking this year again. At the same time, stations

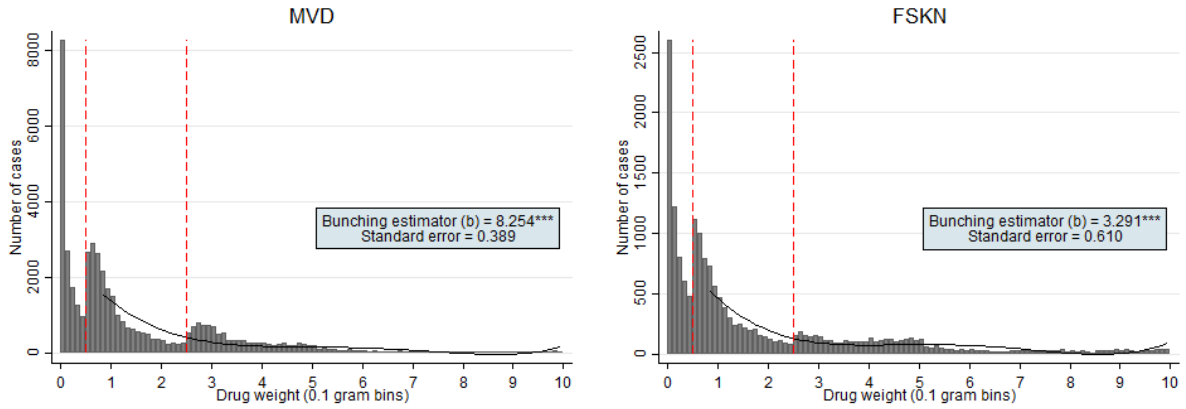
that did not reach their own non-zero 2013 performance level might perform well in 2014 compared to other stations and, therefore, did not need to register as many severe cases as they did in the previous year.

As the event study results suggest, the performance requirements can differently affect the behavior of officers in the two agencies during a year. However, this specification shows the difference in the numbers of all serious and most serious drug crimes and does not tell us how the magnitude of manipulation (the number of cases above the threshold) varies across agencies and over time. To explore the effect of differences in the systems of performance evaluation, I break all heroin related cases into two groups: those initiated by the MVD and those initiated by the FSKN (Figure 1.4). The estimation determines a difference in the values of the bunching estimator, significant at the 1% level. The bunching estimate for the MVD cases is 8.254, while for the FSKN cases it is only 3.291. This can be explained by the difference in the two systems of performance evaluation. In the case of the FSKN, final crime statistics are compared with the performance of other police stations and, eventually, other regions. The FSKN officers do not know the exact level that should be reached in order to obtain a satisfactory performance evaluation. Therefore, the incentives to manipulate in the case of the FSKN are weaker. In turn, the MVD offices compare results with their own performance in the previous period, which is well known to them. Given that the most recent performance should not be worse than previously, the performance evaluation system may incentivize some police officers to behave dishonestly, manipulating drug amounts seized in order to improve their statistics.

The final step is to test whether reaching the target differently affects the magnitudes of manipulation in two agencies. For the performance evaluation, the number of serious and most serious drug crimes is calculated per 100 officers. I do not have information on the size of each regional office, and therefore I cannot exploit the FSKN's cross-region comparison scheme[20]. Instead, assuming that the number of officers at each station is fixed during the 2013-2014 period, I determine the total absolute number of serious and most serious drug crimes solved by each station in 2013. Then, I divide all cases initiated

[20]I conducted an exploratory analysis of the effect of the cross-region comparison scheme, assuming the number of officers to be proportional to the total number of drug crimes solved by each station during each year. First, I identified the FSKN and MVD stations with the highest relative number of serious and most serious drug crimes solved in 2013. Second, for each agency, I split all 2014 cases into two groups: before and after reaching the "best" level of 2013 (established by either the FSKN or MVD station). Finally, I calculated the bunching estimate for four groups of cases. The difference in magnitudes appeared to be insignificant.

Figure 1.4: Distributions of cases initiated by the MVD (left) and the FSKN (right) across quantities of heroin seized

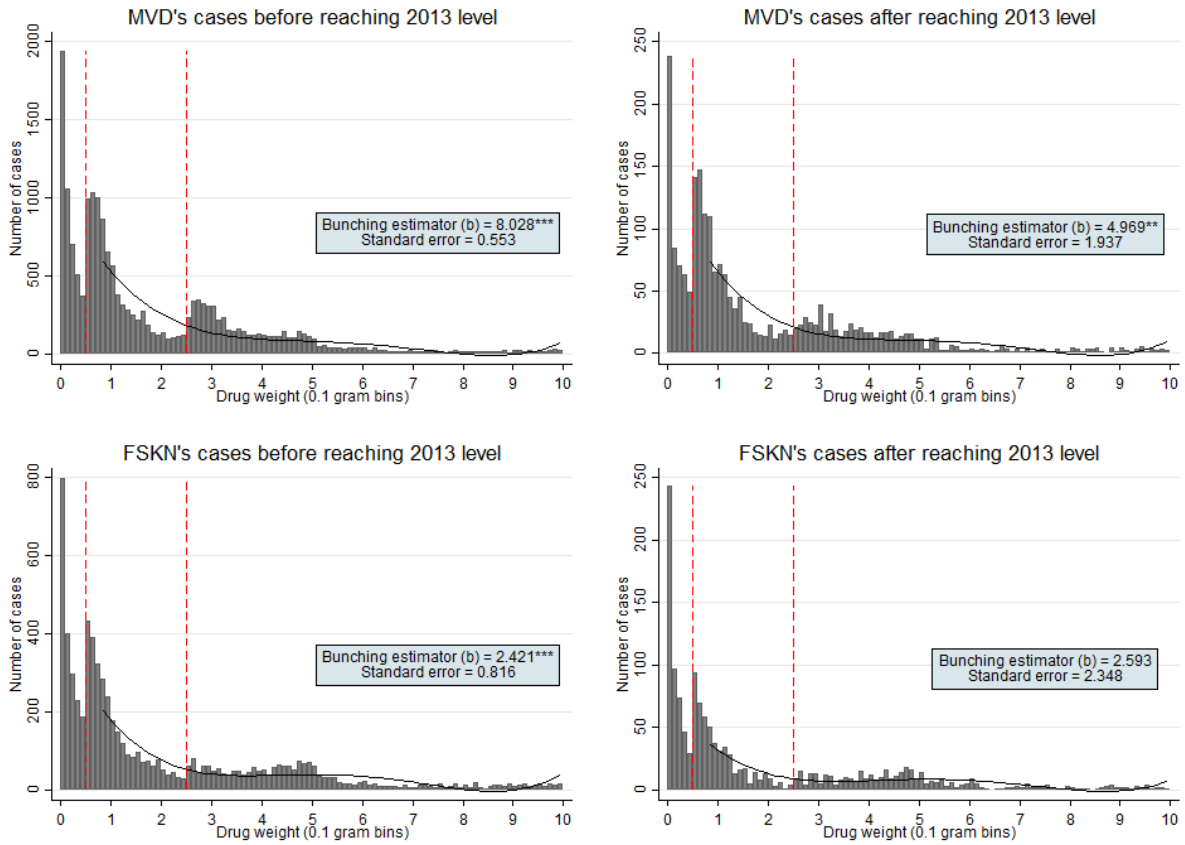


Note: The baseline sample consists of all heroin related cases from form 1 registered in Russia during 2013-2014. The series shown in bars is a histogram of the observed distribution of cases. The solid line is a fourth-degree polynomial fitted to the empirical distribution. The thresholds (dashed lines) determine the scale of seizure (less than significant, significant and large drug amounts), the severity of crime and punishment.

in 2014 (by agency) into two groups: before and after achieving each station's 2013 level. Finally, I check whether the bunching varies between these four groups. As expected, the estimation shows that in the case of the MVD, the magnitude of manipulation is higher when the station had not yet met its previous year's performance level, and that the difference is statistically significant at the 10% level. At the same time, the magnitude of manipulation by the FSKN police stations does not significantly depend on reaching, or not reaching the "benchmark" (Figure 1.5). Thus, these results support the hypothesis that the driving force for manipulation of drug amounts is the performance evaluation system.

It is worth noting that bribery might be another motive for police officers to manipulate the drug amounts, or to threaten offenders with possible manipulation. However, the significant probability to lose the job due to reporting insufficient numbers of arrests and convictions in annual performance reviews could be a strong incentive for police officers to "keep" offenders. This likely outweighs the benefits from receiving a small bribe from a drug user or micro-trafficker, who are usually people of low socio-economic status. At the same time, according to an investigation based on anonymous surveys of 571 victims of extortion from being caught with drugs (Litavrin, Sarang, and Knorre 2017), if an offender decides and is able to pay a bribe, in most of the cases s/he does it to buy himself out of prison, not just to decrease the sentence. This means that those individuals

Figure 1.5: Distributions of cases across quantities of heroin seized during 2014 by the MVD and FSKN police stations before (left) and after (right) reaching the total number of serious and most serious drug crimes solved in 2013



Note: The baseline sample consists of all heroin related cases from form 1 registered in Russia during 2013-2014. The series shown in bars is a histogram of the observed distribution of cases. The solid line is a fourth-degree polynomial fitted to the empirical distribution. The thresholds (dashed lines) determine the scale of seizure (less than significant, significant and large drug amounts), the severity of crime and punishment.

are most likely not in the database at all and these bribery cases are undetectable. In addition, the study suggests that the amount paid in bribes is increasing with the drug quantity; however, it does not find any evidence of the bribe cases bunching at some particular amounts. If, nevertheless, there is a number of cases in which manipulations were triggered by bribery motives but offenders were unable to pay the bribe, it could explain the residual bunching for the MVD stations after reaching the target (Figure 1.5).

As for other potential motives for manipulation, it is highly unlikely that the observed bunching could be explained by the officers' taste for stricter punishment or by their concern for drug users who might have higher chances to recover from the drug addiction in prison if they stay there for a longer period. First of all, in Russia, drug addicts do

not receive any treatment during incarceration and, without proper therapy, they could resume taking drugs after release (Semioshina 2019). Moreover, sometimes addicts may even have access to drugs in prison (The Federal Penitentiary Service of Russia 2017). Second, police officers in Russia do not have legal tools to drug amounts in contrast to, for example, US prosecutors (Tuttle 2019). In addition, using the tool available to Russian police - manipulation - is risky and would not be implemented without significant benefits for the officers.

1.4.3 Mean Characteristics of Possible Victims of Manipulation

There are a number of criteria that a police officer can use to select which offenders to push above the threshold. My analysis begins by calculating summary statistics for the whole population of heroin offenders and for those who fall into the manipulation region. Table 1.9 in Appendix 1.B shows that means are similar across these two samples, suggesting the absence of self-selection into the area around the second threshold. To determine the mean characteristics of victims of manipulation, I use the technique described in Subsection 1.3.2 and present results in Table 1.1.

Table 1.1: Mean characteristics of possible victims of manipulation

	Eligible for manipulation	Manipulated	Diff.	s.e.
Male	0.809	0.858	-0.049^{*}	0.025
Russian	0.856	0.869	-0.013	0.023
Citizen of Russia	0.958	0.949	0.008	0.010
Resident of region	0.906	0.887	0.023	0.015
At most secondary education	0.595	0.574	0.021	0.023
Unemployed	0.761	0.756	0.005	0.018
Repeat offender	0.670	0.733	-0.063^{**}	0.030
Administrative offence[21]	0.076	0.059	0.017^{*}	0.010
Under the influence of drug	0.518	0.467	0.051	0.033
Under the influence of alcohol	0.013	0.016	-0.003	0.008

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The baseline sample consists of all heroin related cases from forms 1 and 2 registered in Russia during 2013-2014. Column 1 presents the predicted mean characteristic of all drug offenders who possessed an unmanipulated amount of drug that fell into the manipulation window below the threshold. Column 2 presents the predicted mean characteristic among the compliers, i.e., the offenders who were actually moved above the threshold. Column 3 tests the difference. To obtain the estimates, I apply the method described in detail in Subsection 1.3.2.

First of all, I check whether such demographics as gender, nationality, citizenship and regional residency affect a police officer's decision to manipulate the seized drug amounts. The only significant difference I find is in the mean shares of men among those who were eligible for manipulation but did not receive the "treatment", and those who were pushed above the threshold. However, this difference is only marginally significant.

Next, I turn to the indicators of an offender's socio-economic status, such as unemployment and education. Individuals from the low socio-economic class are likely to be legally illiterate and not to have any means to protect themselves from police oppression. However, I do not find any evidence that they are more likely to become a victim of manipulation.

As the analysis shows, there is also no significant effect related to an offender being under the influence of drugs or alcohol at the moment of arrest, which, in general, should make this group of offenders a more vulnerable target. The only factor that is significant is the offender's previous criminal history: repeat offenders are more likely to be pushed above the threshold. This is in line with anecdotal evidence: according to one former police officer, there are almost no random persons among manipulated offenders because it is quite risky to manipulate when you do not know how the person could respond. Usually, police officers target those who have been previously convicted or who they know use drugs (Litavrin 2019).

1.4.4 The Effect of Manipulation on Sentence Length

A case by case comparison of heroin weights from forms 1 and 4 shows that they coincide in 92.8% of the full sample[22]. Significant deviations seem suspicious and might be the consequence of mistakes made when filling in the card or converting it into an electronic form. At the same time, observations with large discrepancies in weights are randomly distributed and, therefore, could be excluded from the analysis. Table 1.2 presents the results of an estimation conducted for full and restricted samples, which includes observations with absolute weight differences of less than 14 grams; this being the 95th percentile among absolute nonzero deviations.

The first stage effect of manipulation of heroin amounts registered by police officers in

[21] A wrongful, guilty action (omission) of a natural person or legal entity which is administratively punishable under The Code of Administrative Offences of The Russian Federation. This violation of the law is not serious enough to be considered criminal.

[22] Average nonzero weight difference is -1.231 gram.

Table 1.2: The effect of manipulation on sentence length and probability of pleading guilty

	Absolute difference ≤ 14		Full sample	
	Coefficient	s.e.	Coefficient	s.e.
	Panel A. Sentence length			
First stage	1.190***	0.005	0.497	2.246
ITT	1.206***	0.045	1.209***	0.052
LATE(sentence, years)	1.013***	0.128	2.434***	0.929
	Panel B. Case characteristics			
LATE(plea)	−0.078	0.093	−0.060	0.158
LATE(investigation, days)	1.749	8.598	1.436**	0.688
LATE(adjudication, days)	−0.799	4.455	−0.701**	0.356
LATE(pretrial detention)	0.092***	0.035	0.075**	0.034

* p < 0.10, ** p < 0.05, *** p < 0.01

Note: The baseline sample consists of all heroin use related cases from forms 1, 2, 6 and 4 registered in Russia during 2013-2014. See the text for further details defining the subsample of observations with absolute difference in weights of less than 14 grams. Panel A presents estimates of the impact of drug weights from form 1 on drug weights from form 4 (First stage), as well as ITT effect of manipulation on the sentence length of all individuals in the manipulation region, and LATE of manipulation on the sentence length of compliers only. Panel B presents LATE of manipulation on the probability of pleading guilty, length of investigation, length of adjudication, and probability of pretrial detention. To obtain the estimates, I apply the method described in detail in Subsection 1.3.3.

form 1 on heroin weights recorded in form 4 after the expertise is significant and shows the 1.2 grams increase of drug seized amount for individuals in the manipulation area. There is also a significant effect of being in the manipulation window on sentence length (ITT). However, in order to see the impact of manipulation on compliers' years of imprisonment, I divide ITT by the first stage effect and obtain LATE(sentence), which suggests a one year increase in sentence length for individuals who were pushed above the threshold[23] (Panel A, Table 1.2).

Next, I turn to other case characteristics that could also be affected by the manipulation of drug amounts and, at the same time, could significantly influence the sentence length. First, I check whether manipulation increases the probability of accepting a plea

[23]This estimate is close to that obtained in Skougarevskiy (2017). Applying regression discontinuity design methods to the data on cannabis and heroin cases from Russia, he finds that the length of unconditional incarceration increases by 0.84 years when the drug weight crosses the threshold. My estimate could be higher because I focus solely on heroin cases, which might be considered to be more serious offences than cannabis related crimes. In addition, I estimate the effect for compliers, while Skougarevskiy (2017) shows the discontinuity taking into account all offenders in the window above the threshold.

bargain. Pleading guilty significantly simplifies the whole procedure and a conviction is pronounced without the actual examination of evidence at a court hearing. In addition, a person that accepts a plea bargain waives the right to appeal. Therefore, in the case of manipulation, police officers could offer the plea agreement more forcefully because the credibility of evidence collected is in doubt. Since, in manipulation cases, there is no need for an actual investigation and because of the potentially increased probability of pleading guilty, I also check whether there is a significant effect of manipulation on the length of investigation and length of adjudication. Finally, I explore whether manipulation affects the probability of pretrial detention, because pretrial detention not only prevents offenders from fleeing but also allows police officers to keep manipulated offenders under constant pressure. As the analysis in Panel B of Table 1.2 suggests, the only significant effect here is on the probability of pretrial detention: manipulated offenders are more likely to be detained while they are waiting for a trial by 9%.

1.4.5 Social cost

The total social cost of drug manipulation triggered by inappropriate incentive scheme is difficult to calculate precisely. According to the estimation results from Section 1.4, there were around 3000 offenders, 4% of all heroin offenders in the database, who were moved above the threshold as a result of manipulation during the 2013-2014 period. Around 2000 of them were convicted of drug possession without the purpose of sale and sentenced to an additional year in prison than they would otherwise have been. This is huge impact since it is 67% increase on what these offenders would get without manipulation.

Even though each year the government spends the enormous amount of money on the Penitentiary Service[24], drug addicts do not receive any treatment during incarceration. After release, most of them start taking drugs again and could be convicted for another time. Those who decide to go back to normal life face significant difficulties: longer incarceration exacerbates their situation, strengthening barriers to reintegration and sometimes even increasing the probability to commit another crime due to longer exposure to criminal peers (Bayer, Hjalmarsson, and Pozen 2009; Green and Winik 2010; Aizer and Doyle Jr 2015).

Therefore, the welfare loss from prolonged sentences and inequality in the enforcement

[24]The annual budget of the Penitentiary Service of Russia was constantly growing since the establishment and reached $5 billion in 2015 that is comparable with the budget of some European countries: for example, Albania ($4.5 billion) or Moldavia ($2 billion).

of the law likely exceeds any benefits from keeping drug users off the streets. Even more importantly, multiple manipulations widely discussed in the media lower public trust in the police increasing the level of perceived insecurity. This, in turn, decreases the effectiveness of law enforcement and the efficiency of budget expenditures.

1.5 Conclusion

The tradeoff between motivating civil servants and distorting their behavior has always been a central issue of incentives design. Increasingly, the literature documents a negative effect of high-powered performance-related incentives in the public sector. Nevertheless, their use is still a common practice across bureaucracies in many countries. A particularly notable example of such countries is Russia. A recently published report on drug crimes (Knorre 2017) illuminates revealing statistics on the distribution of criminal cases across quantities of heroin seized. These statistics suggest the bunching of offenders who were arrested with an amount of drugs just above the threshold sufficient to be convicted of a more serious crime. At the same time, there is a missing mass of cases just below the threshold. This might be evidence of manipulation of drugs quantities seized by the police, which so far has only been alleged by various media reports.

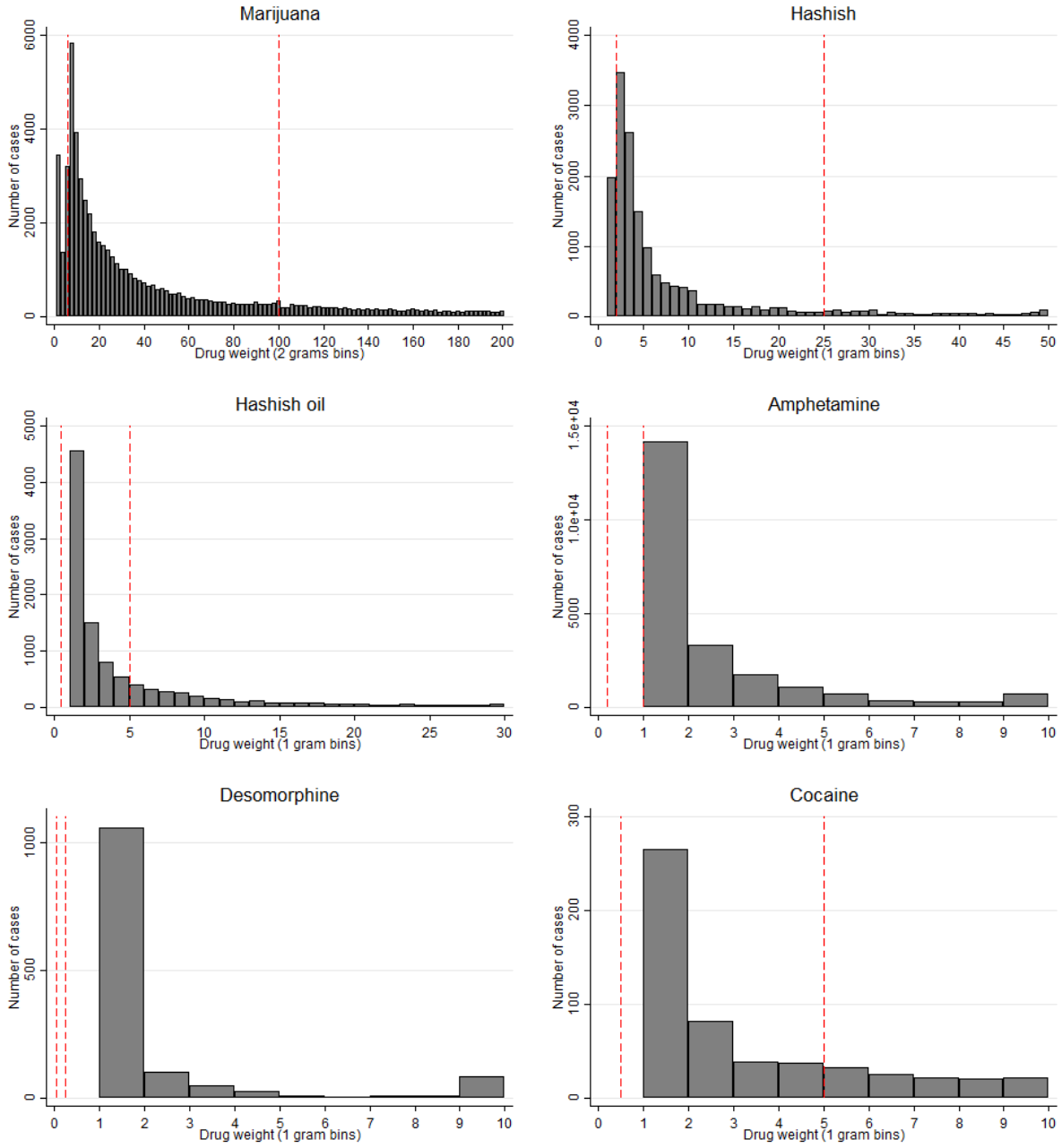
This paper provides an empirical analysis of the mechanism that drives the possible manipulation of amounts of drugs seized using a unique dataset that contains rich information on drug crimes reported in Russia during 2013-2014. Exploiting the specific features of the Russian institutional context, I show how inappropriate incentives from performance evaluation could trigger the misbehavior of police officers. Additionally, the results suggest that individuals with a criminal history are more likely to have their drug amounts manipulated by the police. This manipulation increases the probability of pretrial detention by 9% and its overall effect on sentence length is an additional year of incarceration.

The paper shows the inefficiency of the existing performance evaluation system and raises a question about optimal incentive structure. Forecasting expected results itself is a common practice in many public organizations; this provides guidance for the upcoming period. However, the way in which it is implemented could become an issue (Rasul and Rogger 2018; Banerjee et al. 2021), as in the case of drug control in Russia. Therefore, a comprehensive approach is required in order to improve the situation. The first step on the way to efficiency could be decentralizing the performance evaluation system and

enabling regional offices to take into account local specifics affecting their performance. In turn, evaluating police officers based on local trends in criminal statistics will smooth the incentives arising from performance indicators. Additionally, the cost of misconduct to police officers should be increased significantly. Ultimately, performance systems need to be carefully designed and implemented, or discarded when they do more harm than good.

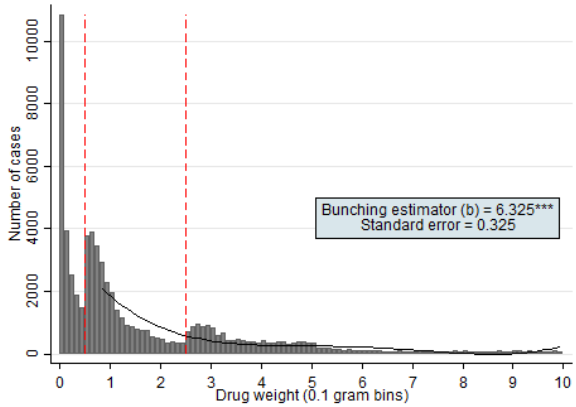
1.A Appendix: Supplemental Figures

Figure 1.1: Distributions of cases across quantities of drugs seized by drug type



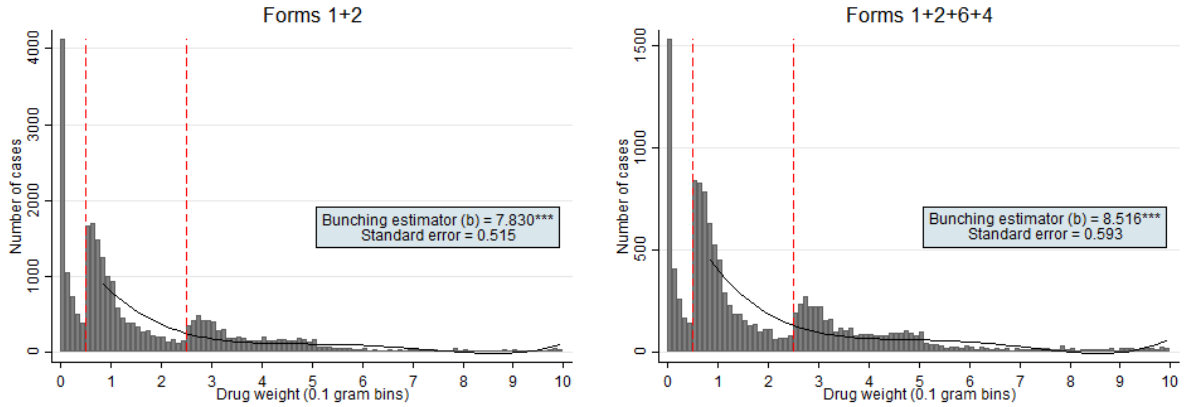
Note: The baseline sample consists of all drug related cases from form 1 registered in Russia during 2013-2014. The thresholds (dashed lines) determine the scale of seizure (less than significant, significant and large drug amounts), the severity of crime and punishment.

Figure 1.2: Distribution of cases across quantities of heroin seized



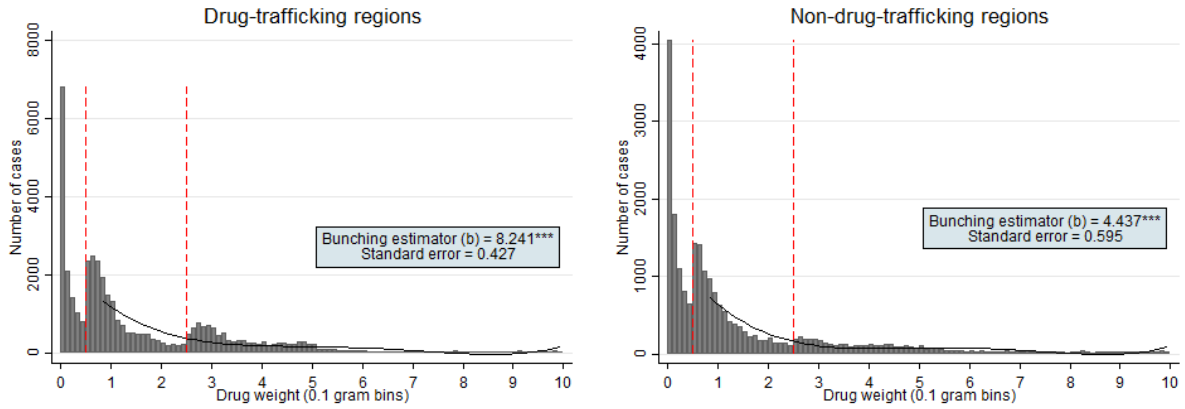
Note: The baseline sample consists of all heroin related cases from form 1 registered in Russia during 2013-2014. The series shown in bars is a histogram of the observed distribution of cases. The solid line is a fourth-degree polynomial fitted to the empirical distribution. The thresholds (dashed lines) determine the scale of seizure (less than significant, significant and large drug amounts), the severity of crime and punishment.

Figure 1.3: Distributions of cases from forms 1, 2 (left) and forms 1, 2, 6, 4 (right) across quantities of heroin seized in Russia during 2013-2014



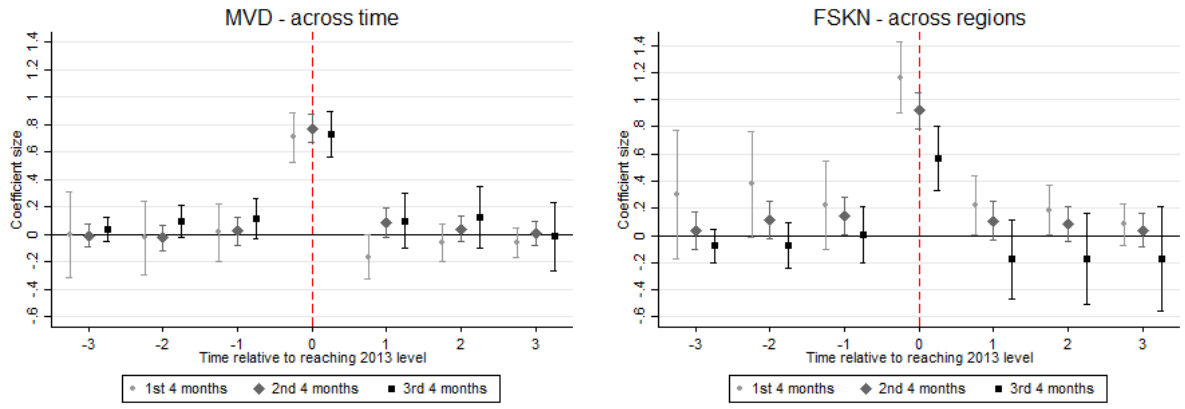
Note: The series shown in bars is a histogram of the observed distribution of cases. The solid line is a fourth-degree polynomial fitted to the empirical distribution. The thresholds (dashed lines) determine the scale of seizure (less than significant, significant and large drug amounts), the severity of crime and punishment.

Figure 1.4: Distributions of cases across quantities of heroin seized in regions which are along (left) or away from (right) the main drug-trafficking routes



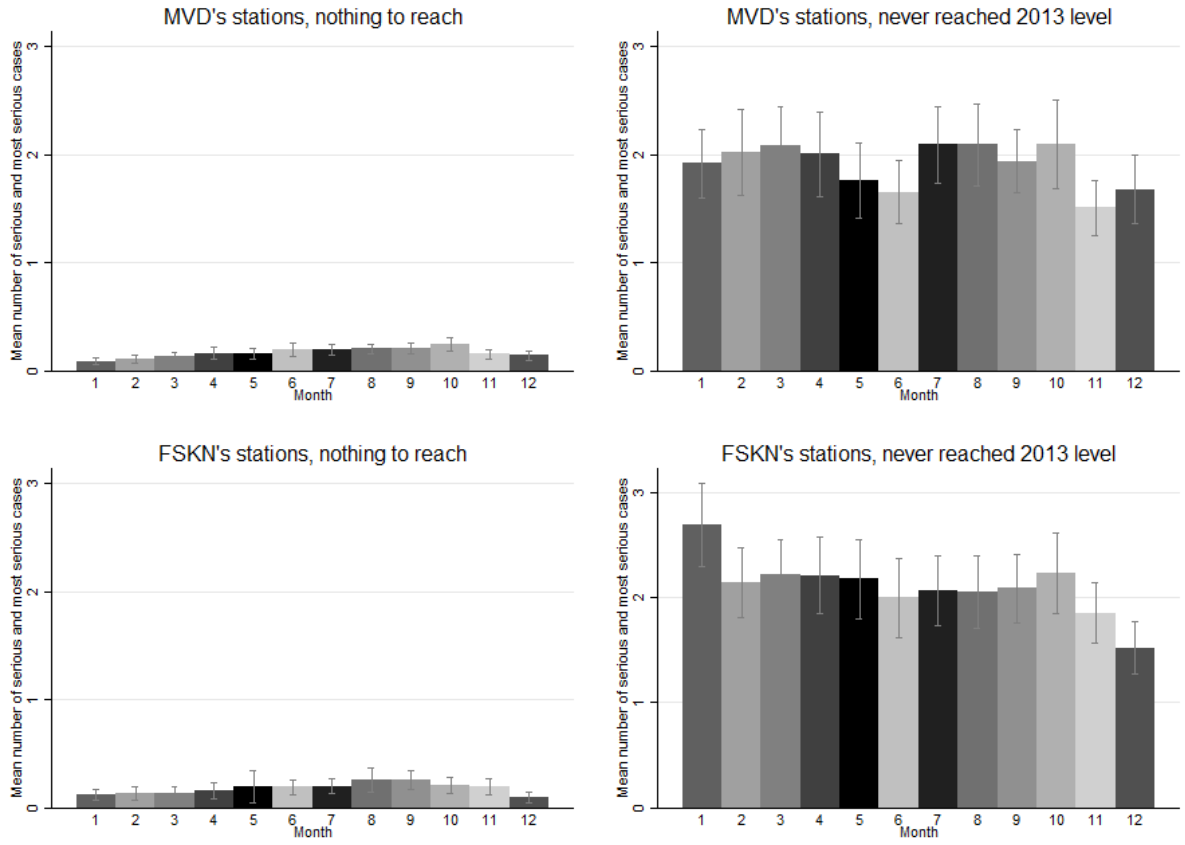
Note: The baseline sample consists of all heroin related cases from form 1 registered in Russia during 2013-2014. The series shown in bars is a histogram of the observed distribution of cases. The solid line is a fourth-degree polynomial fitted to the empirical distribution. The thresholds (dashed lines) determine the scale of seizure (less than significant, significant and large drug amounts), the severity of crime and punishment.

Figure 1.5: The effect of reaching 2013 level on the number of serious and most serious drug crimes registered in 2014, by agency and the period of reaching



Note: The samples include all MVD and all FSKN stations that reached the total 2013 number of serious and most serious drug crimes during the period studied (January - December 2014) split by the period of reaching this number. The regression results are reported in Appendix 1.B, Table 1.7. Standard errors are clustered by station.

Figure 1.6: Mean numbers of serious and most serious drug related offences registered in 2014, by month, agency and group in relation to reaching 2013 level



Note: The series shown in bars present mean monthly numbers of serious and most serious drug related offences registered in 2014 by the MVD and FSKN stations of two types: those which had zero target from previous year (on the left) and those which did not reach their previous year's performance level during 2014. The graph also shows 95% confidence interval for each mean.

1.B Appendix: Supplemental Tables

Table 1.1: The comparison of means and medians for the MVD and FSKN

	Form 1			Form 1+2+6		
	MVD	FSKN	Diff.	MVD	FSKN	Diff.
Drug types:						
Heroin	0.242	0.240	0.002	0.198	0.198	-0.001
Cannabis	0.380	0.322	0.057***	0.471	0.372	0.099***
Amphetamine	0.134	0.147	-0.013***	0.113	0.125	-0.012***
Desomorphine	0.015	0.008	0.007***	0.024	0.016	0.009***
Cocaine	0.002	0.005	-0.002***	0.001	0.003	-0.002***
Papaver, Opiates	0.056	0.061	-0.004***	0.043	0.069	-0.026***
Synthetic cannabis	0.118	0.146	-0.028***	0.110	0.161	-0.051***
Other	0.053	0.071	-0.018***	0.040	0.056	-0.016***
Average drug weight, grams	9.0e+07	2.6e+09	-2.5e+09***	887.118	8170.840	-7.3e+03***
Median drug weight, grams	2.34	5	-2.66***	4	6	-2***
Article 228 (use)	0.672	0.435	0.237***	0.910	0.777	0.133***
Article 228.1 (sale)	0.320	0.494	-0.174***	0.086	0.156	-0.070***
Offender characteristics:						
Male				0.924	0.896	0.028***
Russian				0.881	0.861	0.020***
Citizen of Russia				0.972	0.976	-0.004***
Resident of region				0.915	0.966	-0.051***
At most secondary educ.				0.628	0.563	0.065***
Unemployed				0.694	0.631	0.063***
Student				0.001	0.001	0.000
Worker				0.235	0.289	-0.054***
White collar				0.013	0.016	-0.004***
Previously charged with offence				0.589	0.542	0.046***
Under the influence of drug				0.406	0.506	-0.101***
Under the influence of alcohol				0.051	0.016	0.035***
Punishment types:						
Mandatory works				0.055	0.031	0.024***
Correctional works				0.036	0.023	0.013***
Freedom limitation				0.022	0.016	0.006***
Suspended sentence				0.409	0.443	-0.034***
Real sentence				0.324	0.372	-0.047***
Fine				0.148	0.106	0.043***
Other				0.005	0.010	-0.005***
Sentence length, years				2.722	3.417	-0.695***
Pleaded guilty				0.463	0.199	0.264***
Investigation length, days				55.567	82.115	-26.548***
Adjudication length, days				26.673	32.066	-5.394***
Pretrial detention				0.128	0.130	-0.002
N	222,660	101,686		61,274	17,933	

* p < 0.10, ** p < 0.05, *** p < 0.01

Note: The table compares means and medians for the MVD and FSKN in two samples: form 1, and form 1 merged with forms 2 and 6. The samples consist of all drug related cases registered in Russia during 2013-2014.

Table 1.2: Amounts of drugs (grams above) for purposes of articles 228, 228.1 of the Criminal Code of Russian Federation

	Significant	Large	Especially large
Marijuana	6	100	100000
Hashish	2	25	10000
Hashish oil	0.4	5	1000
Papaver	20	500	100000
Poppy straw	1	5	500
Methadone	0.5	2.5	1000
Heroin	0.5	2.5	500
Amphetamine	0.2	1	200
Desomorphine	0.05	0.25	10
Cocaine	0.5	5	1500
Synthetic cannabis	0.05	0.25	50

Table 1.3: The severity of offence and sanctions according to articles 228, 228.1 of the Criminal Code of Russian Federation

Drug amount	Article 228 (use)		Article 228.1 (sale)	
	Severity	Sentence (years)	Severity	Sentence (years)
Less than significant	Administrative offence	Fine/15 days	Serious	4-8
Significant	Least serious	0-3	Most serious	8-15
Large	Serious	3-10	Most serious	10-20
Especially large	Most serious	10-15	Most serious	15-20

Table 1.4: The comparison of means within the missing values analysis

	Form 1			Form 4			Forms 1+2			Forms 1+2+6+4		
	(1)	(0)	Diff.	(1)	(0)	Diff.	(1)	(0)	Diff.	(1)	(0)	Diff.
Initiated by the MVD	0.682	0.643	0.039***	0.749	0.796	−0.047***	0.753	0.817	−0.064***	0.794	0.942	−0.148***
Initiated by the FSKN	0.314	0.355	−0.040***	0.250	0.204	0.046***	0.245	0.182	0.063***	0.205	0.058	0.147***
Initiated by others	0.003	0.002	0.001***	0.001	0.001	0.001	0.002	0.001	0.001*	0.001	0.000	0.001
Article 228 (use)	0.447	0.364	0.083***	0.530	0.440	0.090***	0.727	0.670	0.057***	0.837	0.793	0.045***
Article 228.1 (sale)	0.550	0.592	−0.042***	0.467	0.537	−0.070***	0.269	0.291	−0.022***	0.160	0.187	−0.027***
Male							0.814	0.837	−0.023***	0.822	0.844	−0.022**
Russian							0.851	0.895	−0.044***	0.876	0.920	−0.045***
Citizen of Russia							0.936	0.957	−0.021***	0.945	0.963	−0.018***
Resident of region							0.893	0.931	−0.037***	0.888	0.915	−0.027***
At most secondary educ.							0.604	0.635	−0.031***	0.593	0.663	−0.070***
Unemployed							0.784	0.810	−0.026***	0.772	0.828	−0.056***
Student							0.0001	0.0005	-0.0004	0.0001	0.0007	−0.0006*
Worker							0.182	0.150	0.032***	0.196	0.133	0.063***
White collar							0.014	0.010	0.004*	0.015	0.014	0.001
Previously charged with offence							0.685	0.590	0.095***	0.682	0.571	0.111***
Under the influence of drug							0.509	0.354	0.155***	0.536	0.358	0.178***
Under the influence of alcohol							0.014	0.014	0.000	0.016	0.016	0.000
Sentence length, years										3.009	2.417	0.592***
Pleaded guilty										0.346	0.604	−0.258***
Investigation length, days										62.863	56.447	6.416***
Adjudication length, days										31.463	29.702	1.761***
Pretrial detention										0.262	0.152	0.111***
N	76,735	12,417		46,593	4,189		30,728	4,268		14,350	1,516	

* p < 0.10, ** p < 0.05, *** p < 0.01

Note: The table compares means in four samples used in the analysis: from form 1, form 4, forms 1 and 2, and forms 1, 2 and 6 merged with weights from form 4. The samples consist of all heroin related cases registered in Russia during 2013-2014. Columns (1) present means in the subsamples without observations with missing drug weight, columns (0) present means in the subsamples of observations with missing drug weight, columns Diff. shows differences in means.

Table 1.5: Robustness check

Starting point	Polynomial degree k	Manipulation window		Bunching estimator b	s.e.
		Lower bound r_l	Upper bound r_u		
0.7	4	1.5	3.3	7.463***	0.305
0.7	4	1.5	3.4	8.879***	0.377
0.7	4	1.5	3.5	10.828***	0.526
0.7	5	1.1	3.3	7.057***	0.415
0.7	5	1.1	3.4	8.123***	0.509
0.7	5	1.1	3.5	9.515***	0.691
0.8	**4**	**1.6**	**3.3**	**6.325*** **	**0.325**
0.8	4	1.6	3.4	7.256***	0.319
0.8	4	1.6	3.5	8.453***	0.398
0.8	5	1.2	3.3	7.885***	0.579
0.8	5	1.2	3.4	9.165***	0.766
0.8	5	1.2	3.5	10.851***	0.956
0.9	4	1.7	3.3	6.398***	0.246
0.9	4	1.7	3.4	6.787***	0.277
0.9	4	1.7	3.5	7.421***	0.309
0.9	4	1.3	3.3	7.459***	0.473
0.9	4	1.3	3.4	8.466***	0.537
0.9	4	1.3	3.5	9.751***	0.572

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The baseline sample from form 1 consists of all heroin related cases registered in Russia during 2013-2014. To obtain the estimates of bunching, I apply the method described in detail in Appendix 1.C.

Table 1.6: Number of stations and their 2013 performance level by group in relation to reaching 2013 level

	MVD stations			FSKN stations		
	N	%	2013 level	N	%	2013 level
Reached 2013 level	1,107	37.87	16.590	511	32.95	15.998
Nothing to reach	529	18.10	0	210	13.54	0
Never reached 2013 level	1,287	44.03	34.141	830	53.51	40.643
Total	2,923			1,551		

Note: The table presents agency specific numbers and shares of stations which reached 2013 level during 2014, which did not reach 2013 level in 2014 and for which 2013 level is equal to zero. The table also shows the average numbers of serious and most serious cases registered by stations in 2013, which in 2014, present their performance targets.

Table 1.7: The effect of reaching 2013 level on the number of serious and most serious drug crimes registered in 2014

	(1) Both agencies	(2) MVD	(3) FSKN
t=-5	-0.014	-0.009	-0.025
	(0.022)	(0.026)	(0.038)
t=-4	0.022	-0.005	0.081**
	(0.021)	(0.025)	(0.038)
t=-3	0.049**	0.051**	0.045
	(0.020)	(0.025)	(0.036)
t=-2	0.093***	0.087***	0.106***
	(0.020)	(0.024)	(0.036)
t=-1	0.118***	0.108***	0.140***
	(0.019)	(0.023)	(0.034)
t=0	0.794***	0.768***	0.848***
	(0.017)	(0.019)	(0.031)
t=1	0.051***	0.050**	0.056
	(0.019)	(0.024)	(0.034)
t=2	0.057***	0.056**	0.056
	(0.020)	(0.024)	(0.037)
t=3	0.003	-0.001	0.008
	(0.021)	(0.026)	(0.036)
t=4	0.016	0.023	-0.002
	(0.023)	(0.028)	(0.041)
t=5	-0.024	-0.025	-0.022
	(0.026)	(0.030)	(0.048)
constant	0.807***	0.792***	0.838***
	(0.016)	(0.020)	(0.028)
Month fixed effects	✓	✓	✓
Station fixed effects	✓	✓	✓
R-squared	0.689	0.691	0.688
N	19,416	13,284	6,132

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Column (1) presents even study estimates for both drug control agencies, column (2) - for the MVD, column (3) - for the FSKN. The samples include all stations that reached the total 2013 number of serious and most serious drug crimes during the period studied (January - December 2014). The dependent variable is the inverse hyperbolic sine transformation of the number of serious and most serious drug crimes per month calculated based on the sample of all drug related cases from form 1. Standard errors in parentheses are clustered by station.

Table 1.8: The effect of reaching 2013 level on the number of serious and most serious drug crimes registered in 2014, by agency and the period of reaching

	MVD			FSKN		
	(1)	(2)	(3)	(1)	(2)	(3)
	1st 4 months	2nd 4 months	3rd 4 months	1st 4 months	2nd 4 months	3rd 4 months
t=-3	-0.006	-0.008	0.037	0.300	0.037	-0.074
	(0.159)	(0.040)	(0.042)	(0.240)	(0.071)	(0.062)
t=-2	-0.025	-0.026	0.094	0.376*	0.111	-0.074
	(0.134)	(0.046)	(0.059)	(0.198)	(0.070)	(0.086)
t=-1	0.014	0.025	0.116	0.221	0.143**	0.009
	(0.108)	(0.053)	(0.074)	(0.163)	(0.071)	(0.105)
t=0	0.704***	0.770***	0.728***	1.164***	0.921***	0.567***
	(0.093)	(0.053)	(0.085)	(0.132)	(0.067)	(0.122)
t=1	-0.163**	0.083	0.099	0.225**	0.107	-0.172
	(0.081)	(0.054)	(0.100)	(0.109)	(0.073)	(0.148)
t=2	-0.062	0.041	0.121	0.186**	0.085	-0.170
	(0.069)	(0.048)	(0.113)	(0.091)	(0.063)	(0.170)
t=3	-0.058	0.010	-0.014	0.080	0.040	-0.171
	(0.054)	(0.043)	(0.127)	(0.076)	(0.061)	(0.194)
constant	0.540***	0.706***	1.010***	0.232	0.771***	1.086***
	(0.123)	(0.033)	(0.029)	(0.167)	(0.048)	(0.040)
Month fixed effects	✓	✓	✓	✓	✓	✓
Station fixed effects	✓	✓	✓	✓	✓	✓
R-squared	0.576	0.669	0.704	0.519	0.609	0.740
N	2,844	4,404	6,036	1,344	2,076	2,712

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Columns (1) present estimates for the first 4 months of the years, columns (2) - for the second 4 months, columns (3) - for the third 4 months. The samples include all stations that reached the total 2013 number of serious and most serious drug crimes during the period studied (January - December 2014). The dependent variable is the inverse hyperbolic sine transformation of the number of serious and most serious drug crimes per month calculated based on the sample of all drug related cases from form 1. Standard errors in parentheses are clustered by station.

Table 1.9: Summary statistics

	Overall		Manipulation region	
	Mean	N	Mean	N
Male	0.814	30,728	0.830	5,008
Russian	0.851	23,025	0.861	3,303
Citizen of Russia	0.936	30,728	0.951	5,008
Resident of region	0.893	28,294	0.895	4,726
At most secondary education	0.604	30,728	0.594	5,008
Unemployed	0.784	30,722	0.755	5,008
Student	0.0001	30,722	0.000	5,008
Worker	0.182	30,722	0.209	5,008
White-collar	0.014	30,722	0.015	5,008
Previously charged with offence	0.685	30,728	0.689	5,008
Under the influence of drugs	0.509	30,728	0.525	5,008
Under the influence of alcohol	0.014	30,728	0.014	5,008

Note: The baseline sample from forms 1 and 2 consists of all heroin related cases registered in Russia during 2013-2014. See the text for further details defining the subsample in the manipulation region around the threshold.

1.C Appendix: Estimation Details

To estimate the magnitude of the response of police officers around the crime severity threshold, I adapt the standard method from the bunching literature (Saez 2010; Chetty et al. 2011; Kleven and Waseem 2013).

To obtain the bunching estimator, I estimate the counterfactual density of seized drug amounts by fitting a high-order polynomial to the observed distribution, excluding the region$[r_l, r_u]$ around the threshold $\overline{D}$:

$$C_j = \sum_{k=0}^{p} \beta_k R_j^k + \sum_{r=r_l}^{r_u} \gamma_r * \mathbb{1}[R_j = r] + \nu_j, \tag{1.1}$$

where C_j is the number of cases in bin j, p is the order of the polynomial, R_j is the midpoint of bin j. For heroin related cases, bin size is set to 0.1 gram, which is approximately the smallest dose that can be bought. To obtain the counterfactual distribution I estimate the predicted values from (1), omitting the γ_r shifters for smoothing the density around the threshold:

$$\hat{C_j} = \sum_{k=0}^{p} \hat{\beta}_k R_j^k. \tag{1.2}$$

Key assumption for the bunching estimator, as well as for any other bunching methodology, is that without manipulation the actual distribution of outcomes in the bunching window would follow the polynomial estimated outside this window.

Comparing the counterfactual and observed distributions, I can estimate the missing mass to the left of the threshold, and the excess bunching mass to the right of the threshold:

$$\hat{M} = \sum_{j=r_l}^{\overline{D}} (\hat{C_j} - C_j) \text{ and } \hat{B} = \sum_{j=\overline{D}}^{r_u} (C_j - \hat{C_j}). \tag{1.3}$$

To determine the lower and upper bounds of the excluded interval, I follow (Kleven and Waseem 2013). Because the excess bunching above the threshold is quite sharp (compared to the missing mass), the upper bound can be determined visually. With r_u fixed I set the lower bound r_l such that $\hat{B} = \hat{M}$.

Finally, I can obtain a bunching estimate for the magnitude of manipulation, calculating the ratio of excess mass to the average height of the counterfactual density above

the threshold:

$$\hat{b} = \frac{\hat{B}}{\sum_{j=\overline{D}}^{r_u} \hat{C}_j / N}, \tag{1.4}$$

where N is the number of bins in the interval $[\overline{D},\ r_u]$.

Since the paper studies the rational response of the police only around the second threshold, I exclude the area around first threshold from estimation.

Chapter 2

For God, Tsar, and Fatherland? The Political Influence of Church

2.1 Introduction

In many countries, religion still plays a significant role in different life spheres, despite official separation of Church and state. Scholars have documented the significant and, in many cases, mixed effects of religion on education (Becker and Woessmann 2009), health (Fletcher and Kumar 2014), pro-social behavior (Norenzayan 2013; Bottan and Perez-Truglia 2015), innovation (Bénabou, Ticchi, and Vindigni 2015), economic growth (Campante and Yanagizawa-Drott 2015; Bai and Kung 2015), and other areas. At the same time, as noted by (Iyer 2016) in his recent survey of economic literature on religion[1], the relationships between religious beliefs, the Church as an Institute, and politics remains understudied. A particular question which needs scholarly attention is the nation-building role of the Church, and how this is utilized by politicians to gain wide public support and to remain in power.

I explore this question by analyzing the impact of the expanding Orthodox Church network in Post-Soviet Russia (measured by the regional density of Orthodox organizations) on individual political preferences and election results. I apply an instrumental variable strategy, constructing a Bartik-style instrument. The instrument is based on the contemporary country-wide shock to the Russian Orthodox Church (ROC) network measured by the yearly average density of Orthodox organizations in the country outside

[1]See also Aldashev and Platteau (2014).

each region. For each region, the shock is weighted by the historical regional density of monks and nuns housed in Orthodox monasteries in 1908.

The Russian context provides a great opportunity to exploit a natural experiment to identify causal relationships. More than 70 years of the Soviet Union completely reshaped Russia which allows me to argue that the spatial distribution of Orthodox monasteries existed before the Russian Revolution is plausibly exogenous to contemporary individual political preferences and regional characteristics. At the same time, these monasteries defined (to some extent) the predisposition of each Russian region to the ROC revival after the Fall of Soviet Union, and nowadays presents a novel measure of historical exposure to the Church.

The results suggest that a denser Church network increases the average local approval rating of the current president. I also document the positive effect of this network on the share of votes for the government candidate in presidential elections. At the same time, I do not find evidence of any impact of the Church on trust in president or on the political popularity of other branches and levels of the government (regional governor, ruling party, Government, and Duma).

The potential mechanisms behind this effect on approval ratings and election results could be of both religious and secular nature. First of all, a denser Church network may increase the number of believers, especially those who visit a church on a regular basis, by increasing the number of churches within walking distance. At church, believers are exposed to the promotion of secular authorities organized by the Church leadership in exchange for resources from the state. In turn, more resources attracted by the wider Church network facilitates the spread of ideas transmitted by the state and appealing to the general public outside the church building too. This can occur, for example, via clerics who speak on the radio and TV, give interviews for newspapers, and actively post on the Internet.

However, analysis suggests that the current Church is not attracting many more potential believers to attend services and is not substantially increasing the share of practicing believers. On the other hand, it does influence the political preferences of those who, regardless of their faith in God, self-identify as Orthodox. Orthodoxy has become a part of national identity, leading to the ROC's playing a nation-building role. Since only a small share of the population regularly attends church and is exposed to the propaganda on site, the ROC has to exploit other channels for persuading. The media could be such a channel, but I do not find sufficient evidence of this that leaves a room for further

research along these lines.

This paper adds to the growing empirical literature on the channels used by politicians (in many cases, autocratic leaders) to gain support and to remain in power. Studies in this area have explored the political effects of violence and repression (Arce 2003), economic reforms and advertisement of economic achievements (Buendía 1996; Guriev and Treisman 2020), censorship and propaganda (Durante and Knight 2012; Adena et al. 2015; Chen and Yang 2019) including reactivation of collective memories (Ochsner and Roesel 2017; Belmonte and Rochlitz 2019). Religion and religious networks are another yet understudied channel. Bentzen and Gokmen (2020) use data on 1,265 premodern societies and 176 countries and find that countries which relied more on divine legitimization are more autocratic today and their populations tend to be more religious. My paper studies the casual effect of Church networks on individual political preferences for autocratic leader. It also discusses the potential mechanisms behind this effect, which align well with insights from the theoretical paper by Murphy and Shleifer (2004). The authors model the formation of social networks through which different ideas can be spread. These networks are usually organized around some core beliefs that bind members together; then, they could be "rented out" to politicians who seek support, in exchange for resources. In the case considered in my paper, the binding force can be both religious beliefs and the idea of a national identity that equates "being Russian" with "being Orthodox"[2].

My paper also contributes to the broader literature on the political influence of Church and religion. These studies document a significant positive effect of church attendance and religious identification on voter turnout (Jones-Correa and Leal 2001; Gerber, Gruber, and Hungerman 2016; Smith 2017). The direction of their influence on political preferences and election results varies with the denomination and particular context studied. For example, Gerber, Gruber, and Hungerman (2016) find that decrease in church attendance due to repeal of blue laws in the U.S. leads to voter turnout decline, which negatively affects Democratic but not Republican vote shares. They also document that this effect is stronger for Catholics than for others. Hong and Paik (2021) study Protestants in South Korea and find that they profess stronger feelings against the North Korean regime. These feelings drive the wide support of Protestants for the conservative party. Spenkuch and Tillmann (2018) investigate the empirical predictors of Nazi vote shares in

[2]The share of people who identify as Orthodox has constantly grown from around 30% in the early 90s to almost 80% in recent years. Meanwhile, the share of those who profess to believe in God has never reached 40%.

Weimar Germany and determine that Catholics were less likely to vote for the NSDAP than Protestants.

In contrast to existing studies, my paper analyses how the Church as an organization influences political preferences (if not through religious beliefs or communications taking place at church) when the majority of the population is not religious and does not attend religious services on a regular basis. In addition, while most papers in the field study Catholicism, Protestantism, or Islam in the U.S., Western Europe, or in developing countries, substantial parts of the world population with diverse cultural backgrounds remain unstudied. To the best of my knowledge, this paper is the first to apply rigorous analysis to studying the Orthodox denomination, which is a part of the world's largest religion, Christianity.

The rest of the paper is organized as follows. Historical background and data are discussed in Sections 2.2 and 2.3. In Section 2.4, I describe the empirical strategy. Section 2.5 presents the results, and Section 2.6 concludes.

2.2 Historical Background

2.2.1 The Russian Orthodox Church and the State

The Russian Orthodox Church (ROC) emerged in the tenth century, after the Christianization of Kievan Rus', the first forerunner of the modern Russia state. In 988, Rus' Prince Vladimir baptised himself and ordered his people to be converted to Orthodox Christianity. Until 1448, the Russian Church operated under the authority of the Constantinople Patriarch and was headed by the Metropolitans of Kiev who resided in Moscow after 1328. In 1448, Russian bishops elected the Metropolitan without recourse to Constantinople, and, finally, in 1589, the Metropolitanate of Moscow was promoted to the Patriarchate of Moscow (Marsh 2013). This was an important milestone in the history of the ROC: Russia became home to the only Patriarchate whose ruler was Orthodox, and was thought of as the capital of the "Orthodox world". Though the Russian Church was no longer dependent upon Constantinople, it continued the Byzantine tradition of authorizing the state's participation in the Church's administrative affairs.

In 1721, the Church was put under the direct control of the state when Tsar Peter I (the Great) dissolved the Patriarchate of Moscow and replaced it with the Holy Governing Synod (Marsh 2013). Nevertheless, the religion and Church were still crucial components

of the society, especially, when there was a need for mobilization. In 1812, the slogan "For God *(or Faith)*, Tsar, and Fatherland" was created and used to bring people together to protect Russia from the French invasion. In 1833, this slogan was reformulated by the minister of education, Uvarov, as "Orthodoxy, Autocracy, and Nationality", and then became a dominant ideological doctrine of Tsar Nicholas I (Gaida 2013). Later, the triad was used by Putin to reestablish Russian identity and distinguish Russia from the West.

In 1917, after the collapse of Tsarist regime, the Patriarchate of Moscow and pre-Petrine independent governance of the Church was reestablished. However, the new Soviet government soon declared the separation of state and Church. It nationalized all Church lands and imposed brutal repressions against clerics and destruction of churches or their conversion to secular use (Marsh 2013). The Church was severely suppressed because it was considered a powerful ideological and political opponent, the last bastion of Tsarism.

The revival of the ROC began in the late 1980s and intensified after the collapse of the Soviet Union. Under the 1990's law on "Freedom of conscience and religious belief", the ROC was allowed to resume its activity as before the Soviet era, but now it had to compete with other religious institutions. However, in 1997 after a personal meeting with Patriarch Aleksei II, president Yeltsin passed a law giving the ROC privileged status (Marsh 2013). Since then, during the presidencies of Putin and Medvedev, the ROC has consistently received significant support from the state in the form of direct financial transfers and fiscal subsidies, as well as via laws, policies and political privileges (Rosenthal 2019). This facilitated the relatively quick revival of the Russian Orthodox Church after the fall of the Soviet Union. In 1988, the ROC had 6,893 parishes across the whole Soviet Union (Metropolitan Kirill 2009)[3], but by 2019 this number had grown to 38,649 (Patriarchia.ru 2019). This is still fewer than half of the pre-Revolution number of almost 78,000 (Patriarchia.ru 2005).

2.2.2 Monasticism in Russia

Monasticism arrived in Russia together with the Christianization of Kievan Rus' in the tenth century. During the Turco-Mongol rule, most Orthodox monasteries were destroyed, as they were primarily located in or near cities, which bore the brunt of the destruction of this period. The waning of monastic tradition was also influenced by a spiritual decline

[3]Today, Kirill is Patriarch.

within Russian society, which was suffering from economic and political decline (Sinicyna 2002).

A revival of monasticism occurred around the end of fourteenth century and was associated with the personality of Sergiy Radonezhsky, a spiritual leader and monastic reformer who placed strong emphasis on asceticism. Large numbers of monasteries were founded in distant and obscure locations all across medieval Russia. Later, these small settlements expanded into larger centers, making monasticism one of the bases of social and economic life (Sinicyna 2002).

In 1917, after the Revolution, monasteries were among the first religious institutions abolished. In 1908, the ROC had 1,105 monasteries (Denisov 1908), but by 1930s almost all of them had been dissolved. Nowadays, the Church has almost restored its pre-Revolution number of monasteries: at the beginning of 2019, there were 972 monasteries (Patriarchia.ru 2019), with 536 currently functioning and located in Russia. Around 60% of these monasteries have been built before the Revolution and restored after the fall of the Soviet Union (Hramy Rossii nd).

2.3 Data

In this section, I describe my main variables and the data I use in their construction. The summary statistics and sample periods are presented in Appendix 2.B, Table 2.1.

2.3.1 Political Popularity

Individual level information on approval, trust, electoral preferences, and core demographics is taken from the nationally representative opinion poll "Courier", conducted by the Levada Analytical Center. The main advantage of this survey is that it includes an identifier for regions, which is needed for merging these individual level data with the density of religious organizations measured at the regional level. I collect data for the 1997-2019 period, though for some measures of political popularity, these data are available only with gaps (Appendix 2.B, Table 2.1).

Using "Courier", I construct several measures of political popularity. First, individual approval of the current president is captured by a dummy taking the value of 1 if a respondent answers "approve" to the following question: "In general, do you approve or disapprove of the actions of the president of Russia?". Approval ratings for the regional

governor, Government, and Duma is determined in the same fashion. Second, trust in the president is measured by the question: "Name the 5-6 politicians you trust the most"[4]. Based on this question, I construct a dummy equal to 1 if the current president is named. Third, electoral preferences for the government candidate is represented by a dummy equal to 1 if the respondent chooses this candidate in the question: "If presidential election were held this Sunday, which candidate would you be most likely to vote for?". Electoral preferences for the ruling party are determined in the same way.

I also construct several measures of the political popularity of a specific person - Vladimir Putin. I create a dummy for trust equal to 1 if the respondent names Putin as a politician s/he trusts, and a dummy for readiness to vote for Putin equal to 1 if the respondent chooses Putin from the list of politicians even if he does not (could not) run for office.

Data on actual election results are taken from the website of the Central Election Commission. They are presented in terms of the regional shares of votes for the government candidate in presidential elections (in 2000, 2004, 2008, 2012, 2018) and for the ruling party in parliamentary elections (in 2003, 2007, 2011, 2016).

2.3.2 Religious Organizations

According to a Russian law from 1997, any grouping of people formed for the purpose of joint worship and propagation of faith is called a religious organization and should be registered as a non-profit organization in the Unified State Register of Legal Entities. To be registered, a group must have at least 10 members, a physical address, and a name which includes its denomination. In this paper, data on religious organizations are collected from the Spark database, which contains rich information on all for-profit and non-profit organizations registered in Russia. It provides the name, address, and dates of establishment and dissolution of each religious organization, which allows me to calculate the current number of organizations by denomination, year, and region.

During the 1997-2019 period, around 20,000 Orthodox religious organizations were registered in the Spark. 92% of them are entered into the database as "church parish", "parish" or "church"; 2% as "community"; 3% as "monastery"; and 3% as various organizations administrated by the ROC, such as, for example, a shelter, school, publishing house, etc.

[4]In contrast to other questions, the question on trust is open-ended, which could affect the results. I discuss this in more detail in Section 2.5.

To construct my measure of the Church network, I divide the annual number of Orthodox organizations in a region by the regional population and obtain the regional density of churches. In the remainder of the paper, I refer to this measure simply as "Orthodox density".

2.3.3 Historical Data

To create the historical instrumental variable, I manually collect novel data on the number of monasteries and the number of monks and nuns in each Russian region before the Russian Revolution. The information comes from the handbook "The Orthodox Monasteries of Russian Empire" compiled by Denisov (1908). Since the administrative division at that time was different from the one now, I use various Internet resources[5] to check the location of a monastery within contemporary regional borders.

According to Denisov (1908), in 1908, there were 1,098 monasteries and 90,403 monks and nuns in the Russian Empire. 829 monasteries were located within contemporary Russian borders. This number includes 475 men's monasteries and 354 women's monasteries. Meanwhile, there were considerably fewer monks than nuns: 16,482 monks to 57,892 nuns.

2.3.4 Media

To construct the media measure, I explore the number of mentions of traditional family values and the ROC in all Russian media outlets covered by Integrum, a Russian media database. A publication is considered to contain information about traditional values and the Orthodox Church if it includes any two phrases from the following sets: "traditional values", "traditional family values", "family values" and "Orthodox Church", "Russian Orthodox Church", "ROC" (Russian Orthodox Church). In addition to the total number of mentions, I also collect the number of mentions found in regional sources separately. To account for the differences in the salience of this topic in media by region and year, I divide all numbers of mentions by the total number of weather reports following Belmonte and Rochlitz (2019).

[5]For example, I use the website http://temples.ru, which collects information on Orthodox churches for the project "Churches of Russia". I also use Wikipedia, Google and Yandex maps.

2.3.5 Other Data

All regional level data including population size, GDP per capita, and unemployment rate, along with 1990 regional characteristics come from the Federal State Statistic Service (Rosstat). This source also provides information on the regional shares of population with access to analog and digital TV, and the number of published newspapers per 1,000 inhabitants. I use these measures to construct their first principal component to proxy for the average media coverage by region and year.

2.4 Empirical Strategy

To examine the link between the density of Orthodox religious organizations and political attitudes, I begin with the simplest specification, and gradually add individual level and then regional level controls. Controls help to correct for possible omitted variable bias; however, there could still be an endogeneity. To account for this potential issue, I use the instrumental variable strategy:

$$\begin{aligned} Approval_{ijt}^{IV} = \beta_1 Orthodox\_Density_{jt} + \mu_j + \delta_t + \\ + Ind\_Controls_{ijt} + Reg\_Controls_{jt} + \epsilon_{ijt}, \end{aligned} \tag{2.1}$$

where $Approval_{ijt}$ is a dummy equal to 1 the respondent i in region j approves of the current president in year t, $Ind\_Controls_{ijt}$ is the set of individual level controls, $Reg\_Controls_{jt}$ is the set of regional level controls, μ_j and δ_t are region and year fixed effects. The variable of interest is $Orthodox\_Density_{jt}$, the average density of Orthodox religious organizations (the number of organizations per 1,000 inhabitants) instrumented with the historical instrument.

To construct the instrumental variable, I employ "Bartik" approach (Bartik 1991), weighing country-wide shocks to the Orthodox Church network outside the region with the historical regional exposure to the ROC:

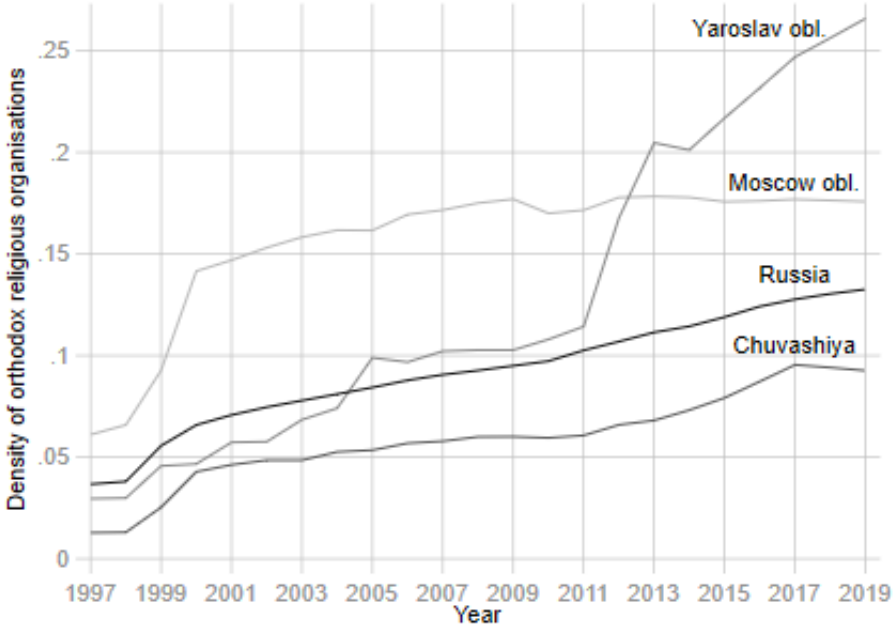
$$Instrument_{jt} = Orthodox\_Density_{-jt} \cdot Historical\_Exposure_j. \tag{2.2}$$

where $Orthodox\_Density_{-jt}$ is the overall density of Orthodox religious organizations in the country outside the region j in year t, $Historical\_Exposure_j$ is the number of monks and nuns in the region j in 1908 divided by the regional population in 1997, the first year

of my sample. $Instrument_{jt}$ captures the overall presence of the Orthodox Church in the country in a given year, but this presence is assumed to have a greater impact in regions with more monasteries as historical religious markers. The number of monks and nuns in $Historical\_Exposure_j$ gives a naturally weighted measure of monasteries in 1908, assigning higher weights to larger monasteries with more monks and nuns.

The instrument is based on two characteristics of the evolution of the Church network in Russia. First, as Figure 2.1 shows, the variation in the national density of Orthodox organisations is not driven by business or political cycles, and there is a heterogeneity in the response of regional church networks (variable $Orthodox\_Density_{jt}$ in the baseline specification (1)) to the country-wide shock.

Figure 2.1: Density of Orthodox religious organisations



Note: The graph presents time trends in the density of Orthodox religious organisations in Russia and three Russian regions.

Second, historical weights defined by the 1908 density of monks and nuns could be considered plausibly exogenous to contemporary individual political preferences and regional characteristics. This is due to the Russian Revolution and more than 70 years of the Soviet Union, which completely reshaped Russia by changing regional borders, making people to move around the country and unifying the society both economically and culturally. One of the main objectives of the Soviet government was rapid industrialization. This began with the development of domestic natural resources which were

mainly located in remote and underdeveloped regions in Siberia, the North, the Far East, and Central Asia. The construction of new plants, hydroelectric stations, road network, and cities near these natural resources fields required substantial human resources, which in the Russian Empire were mainly concentrated in the Western part of the country. Therefore, the Soviet government conducted a massive campaign to increase voluntary migration to the East, and established a system of forced-labor camps, the GULAG. There was also a system of forced settlements built for various deported categories of population ("anti-Soviet" citizens, including some entire nationalities) and migrants who were supposed to fill ethnically cleansed territories.

Table 2.2 in Appendix 2.B presents the results of simple cross-sectional regressions of regional characteristics in 1990 on the density of Orthodox monks and nuns in 1908 without (column (1)) and with (column (2)) economic district[6] fixed effects. It shows that, after controlling for district fixed effects, the socio-economic state of Russian regions in the last year before the collapse of the Soviet Union was mostly independent from the spatial distribution of monasteries in the Russian Empire.

2.5 Results

2.5.1 Main Effects

Table 2.1 presents the results of OLS (columns (1)-(3)) and 2SLS (column (4)) analyses. They suggest that the denser Orthodox Church network increases the approval rating of the president. This effect is significant and holds across different specifications. However, its OLS estimates are likely to be downward biased due to omitted variables. For example, OLS models do not account for the presence of opposition members who could negatively affect the overall presidential approval in regions but, at the same time, support the Orthodox Church. In the first stage of 2SLS, the cluster-robust Kleibergen-Paap F statistic is above 10. Nevertheless, I also report weak-instrument-robust Anderson-Rubin 90% confidence interval for the effect of the Orthodox Church network, which shows that the estimate is significant.

The magnitude of the effect of Orthodox Church expansion on presidential approval

[6]In some exercises in the main analysis, I use federal unit fixed effects. However, the division by federal unit was only introduced in 2000. Therefore, in the models in Table 2.2, Appendix 2.B, I turn to the Soviet Union division by economic district. The composition of these economic districts is similar to that of contemporary federal units.

Table 2.1: The density of orthodox religious organizations and approval of the president

	Approval of president			
	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS
Orthodox density	0.599***	0.593***	0.568***	0.840**
	(0.218)	(0.216)	(0.208)	(0.341)
Individual controls		✓	✓	✓
Regional controls			✓	✓
Region FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓
1st stage coef.				0.809***
				(0.242)
R^2	0.276	0.281	0.281	
Kleibergen-Paap F				11.168
Anderson-Rubin 90% CI				[0.306, 1.543]
N	35,395	35,341	35,341	35,341

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Columns (1)-(3) present the results of OLS analysis. Column (4) shows the results of 2SLS analysis (specification (1)). Standard errors in parentheses are clustered by region.

is substantial. The average increase in the regional density of Orthodox religious organizations during the sample period (between 1997 and 2019) is 0.12[7]. Together with the 2SLS estimate from Table 2.1, this implies that in an average region the expansion of the Orthodox Church in past two decades led to an increase in the approval rating of the president by 10 percentage points (0.12 x 0.840 x 100).

To investigate whether there is a similar effect for other branches and levels of authority, I use the approval of regional governor (gubernator), Government, and Duma as dependent variables. Table 2.3 in Appendix 2.B shows that the only significant estimate is for the approval rating of the Duma. Note, however, that the sample with responses to question about the Duma is much shorter, starting only in 2011.

Two other measures that are also used to define political popularity are trust and readiness to vote for the government candidate in presidential elections (ruling party in Duma elections). In contrast to approving of the president, I do not find any effect of the Church network on trust: the coefficient is unexpectedly negative and insignificant

[7]While in 1997 there were around 4 Orthodox religious organizations per 100,000 population, by 2019, their number increased to 16 per 100,000 population on average.

(column (1) in Table 2.4, Appendix 2.B). This could be explained by several factors. As noted in 2020 by Lev Gudkov, sociologist and the director of Levada Center, approval is a respondent's evaluation of a politician's plans and promises, his or her political line, especially in the area of foreign policy and protection of the country from external "enemies" such as Western culture. In contrast, trust is more about whether respondents perceive the politician as telling the truth (about the situation in the country, about his or her income and taxes paid, etc.) and being able to implement what s/he promised, especially in terms of domestic policies (Lipskiy 2020). This can be more easily influenced by state propaganda potentially also transmitted by the Church. Another factor that might affect the results is a difference in the types of questions used to measure trust and approval. An open-ended question is used to measure trust: the respondent needs to remember and name 5-6 politicians s/he trusts. For approval, the respondent is asked directly whether s/he approves of the actions of the current president (with the name of the current president closing the question).

Table 2.4 in Appendix 2.B presents the results for electoral preferences. The estimates of the effect of the Church network on readiness to vote for the government candidate (columns (2)) or ruling party (column (3)) are also imprecise, but are in the same direction as approval and are of similar magnitude. When I turn to the analysis with the actual election results by regions instead of individual electoral preferences, I find support only for the insight on the government candidate and not on the ruling party (Appendix 2.B, Table 2.5). Column (1) shows the positive (but still insignificant) estimate of the Church effect on the share of votes in presidential elections, which becomes significant when I interact Orthodox density with year dummies (column(4)).

Of the 1997-2019 period studied in this paper, Putin was president for almost 16 years. This raises two questions: (i) could the estimated effect on approval be fully attributed to Putin himself? and (ii) will the effect on trust and electoral preferences become significant if I define these two measures of political popularity specifically for Putin?. Table 2.6 in the Appendix 2.B shows that the estimate for the effect of church networks on approval ratings during Medvedev's presidency is actually slightly higher than during Putin's presidency (column (1)). These effects for Putin and Medvedev are not statistically significantly different, though. Columns (2) and (3) present insignificant estimates for the effect of the Church network on trust in and readiness to vote for Putin.

2.5.2 Robustness

To ensure that the results obtained for the approval rating of the current president can be interpreted as causal, I redo the analysis modifying the baseline specification as described further in this section and present the estimates in Appendix 2.B, Table 2.7.

First, there could be a concern that the results are driven by differential region-level dynamics that could be correlated with my instrument. Year x region fixed effects would help to control for this dynamics; however, since my variable of interest and my IV are measured at the regional level, a specification with these interacted fixed effects is too demanding. Therefore, I include region fixed effects and allow time fixed effects to vary by federal unit[8]. The estimate is presented in column (1). Even after partialing out the significant part of the variation in the density of Orthodox religious organizations, the Orthodox Church network remains an important determinant of the approval of the president.

I also check whether my results are robust to an alternative assumption about the correlation between the error terms. For that, I apply my baseline specification (1) with clustering standard errors by year x federal unit, in addition to region. Column (2) shows that standard errors in this case are just slightly higher than the baseline estimate and the coefficient remains significant at the 5% level.

In column (3), I check whether the results hold if I control for the larger federal units instead of small regions as I did in the analysis of the correlations between the historical density of monks and nuns and socio-economic characteristics of Russian regions in Table 2.2, Appendix 2.B. The coefficient is of lower magnitude, but remains positive and significant.

Column (4) presents evidence that my results are not driven by Moscow and St.Petersburg. The Point estimate is close to the baseline one even after dropping these two administrative units. Its significance decreases slightly, but this could be due to the substantial reduction of the sample.

[8]The division by federal unit was introduced in 2000 and was similar to the established Soviet Union division by economic districts. Since their introduction, these federal units have undergone changes in the total number of units (from 7 to 8) and their composition. For consistency, I use federal districts as introduced in 2000 for the 1997-1999 period.

2.5.3 Mechanisms

In line with insights from the theoretical paper by Murphy and Shleifer (2004), the Orthodox Church in Russia can be considered a network initially organized around religious beliefs, which later became prone to being "rented out" by its leaders to politicians seeking support in exchange for resources. The amount of such resources received by the ROC from the state has been constantly growing over the past two decades, and includes both financial support and fiscal subsidies, and also laws, policies, and political privileges, which have advantaged the ROC over other religious institutions (Rosenthal 2019)[9]. In exchange for these resources, the ROC provides support to the state by both directly promoting the secular authority and by disseminating ideas transmitted by the secular authority and appealing to the general public.

This relationship between the Orthodox Church and the state was relatively stable until 2014, when Crimea was annexed and war in Ukraine began. The actions of the Russian authority were not officially supported by patriarch Kirill, because approving the annexation would mean that the Church borders would coincide with the state borders. In this case, the ROC would gain the Crimean section of the Ukrainian Orthodox Church, but lose the control over other Orthodox parishes in Ukraine (Gorevoy 2019; Financial Times 2019). This geopolitical misalignment could disrupt the Church channel used for persuasion and to attract the support of the general public. To investigate this, I run an IV analysis (specification (1)) interacting $Orthodox\_Density_{jt}$ with period dummies for years in 1997-2013, 2014-2015 and 2016-2019 intervals. The interactions are instrumented with my instrument interacted with the same set of dummies. I focus on the 2014-2015 period because the approval rating of president Putin spiked significantly in 2014, after the annexation of Crimea; however, the euphoria lasted only for approximately two years (Appendix 2.A, Figure 2.1).

Table 2.2 presents the results of the estimation. They suggest that in 2014 and 2015, the Orthodox Church played a lesser role in managing the approval rating of the president than it did before and after the "Crimea effect" (column (1)). The insignificant estimates of the impact of the Church network during that period are obtained for all respondents living either in rural or urban area of the region (column (2)). However, this disappearance of the church effect during the 2014-2015 period is mainly driven by more

[9]Rosenthal (2019) collects data on instances of preferential institutional, fiscal and political state support of the ROC and constructs a composite index of this support, which was increasing over the period studied in the paper (2002-2018).

urbanized regions, where at least 50% of the population lives in an urban area (column (3)). In these regions, people may have been exposed to a greater amount of information from various sources, which made them more aware of patriarch Kirill's position regarding Crimea annexation and potentially disrupted the Church channel.

Table 2.2: The annexation of Crimea and the impact of the church network on the approval of the president

	Approval of president		
	(1)	(2)	(3)
		Rural/urban individual	Rural/urban region
Orthodox density, 1997-2013:	1.058**		
	(0.448)		
rural		1.083**	1.214**
		(0.481)	(0.482)
urban		1.049**	1.095**
		(0.447)	(0.452)
Orthodox density, 2014-2015:	0.669		
	(0.439)		
rural		0.671	0.943**
		(0.481)	(0.455)
urban		0.668	0.540
		(0.434)	(0.454)
Orthodox density, 2016-2019:	1.008***		
	(0.342)		
rural		1.044***	1.168***
		(0.382)	(0.366)
urban		0.997***	1.013***
		(0.337)	(0.346)
Individual controls	✓	✓	✓
Regional controls	✓	✓	✓
Region FEs	✓	✓	✓
Year FEs	✓	✓	✓
Kleibergen-Paap F	2.563	1.280	1.361
N	35,341	35,341	35,341

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of the 2SLS analysis, in which the density of churches is interacted with period dummies. The model in column (2) distinguishes between respondents living in rural and urban areas of the region, the model in column (3) distinguishes between respondents living in more rural and more urban regions. Standard errors in parentheses are clustered by region.

When the Church channel is not disrupted, there are at least two ways state-supporting ideas can be spread by the Church. First, through local communities of believers, especially those who visit a church on regular basis. Second, the denser Church network

attracts more resources, which allows it to transmit the ROC's support of the state and the state's ideas outside the church and beyond the community of believers. The latter may occur, for example, via clerics who speak on the radio and TV, give interviews for newspapers, and actively post on the Internet.

To explore these mechanisms, firstly, I check whether the wider Church network is able to effectively increase the numbers of those who self-identify as Orthodox. Columns (1) in Table 2.3 present the results of IV estimation with a dummy for Orthodox respondents as the dependent variable, which suggest that the network of Orthodox churches does not affect self-identification. Moreover, column (2) shows that the impact of the ROC on the approval of the president is above and beyond its expected effect on self-identification. Even after controlling for being Orthodox, the effect of the church network on the presidential approval is positive and still significant at 10% level. In addition, in rural areas, this effect is of the same magnitude for both Orthodox respondents and all other respondents, and almost three times greater than the one for Orthodox individuals in urban area (columns (3)-(6)).

Table 2.3: Orthodox self-identification and approval of the president

	Orthodox	Approval of president					
	(1)	(2)	(3)	(4)	(5)	(6)	
			Rural		Urban		
			Orthodox	Others	Orthodox	Others	
Orthodox density	-0.770	2.086*	6.012*	6.558**	1.969*	-3.273	
	(1.878)	(1.084)	(3.534)	(2.646)	(1.090)	(2.157)	
Orthodox		0.072***					
		(0.016)					
Other denominations		0.039*					
		(0.022)					
Individual controls	✓	✓	✓	✓	✓	✓	
Regional controls	✓	✓	✓	✓	✓	✓	
Region FEs	✓	✓	✓	✓	✓	✓	
Year FEs	✓	✓	✓	✓	✓	✓	
Kleibergen-Paap F	20.728	20.663	11.784	17.739	18.671	15.868	
Anderson-Rubin 90% CI	[-3.707, 2.476]	[0.390, 3.961]	[1.100, 14.391]	[2.894, 11.946]	[0.266, 4.031]	[-8.051,-0.265]	
N	8,531	8,422	1,485	755	4,544	1,634	

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of a 2SLS analysis with a dummy for orthodox respondents (column (1)) and approval of the current president (columns (2)-(6)) as a dependent variable. In all columns, Anderson-Rubin 90% CI is constructed for the instrumented variable of interest - the density of Orthodox religious organizations. Columns (1) and (2) report estimates for the full sample in rounds, when the religion related question was asked. Columns (3)-(6) report estimates for the subsamples of orthodox respondents and all other respondents in rural and urban areas. Standard errors in parentheses are clustered by region.

This may be partially attributal to the fact that, for many people in Russia who

self-identify as Orthodox, Orthodoxy is an expression of Russianness which has little to do with actual faith and religious practice. According to the Levada Center (Appendix 2.A, Figure 2.2), the share of "Orthodox" Russians rose from 31% in 1991 to 77% in 2019. However, at the same time, not all of them choose "I believe in the existence of God without any doubts" when asked about their faith, and only 10-15% of respondents claim that they attend church once a month or more often. For my sample, individual-level data on belief in God and church attendance are available only for one and three years, respectively, which makes a rigorous analysis infeasible. However, I find a suggestive evidence that while being unable to attract new "churched" believers or even significantly increase the number of those who only self-identify as Orthodox, the ROC takes an important part in strengthening the political preferences for the government candidate in this broad group of Orthodox citizens.

Another channel for transmitting ROC's support of the state, which could be more relevant in this context than direct exposure at church, is that the denser Church network may be a source of more people and tools to spread ideas appealing to the general public outside the church. To study this aspect, first of all, I check whether the denser Church network increases the number of mentions of "Orthodox church" and "traditional values" in various media outlets. These "values" have been used in state propaganda since 2012, mainly to promote traditional families and oppose same-sex marriage. Since then, this concept has been heavily exploited by Russian authorities to gain the support of conservative citizens, and the Orthodox Church has played a significant role in spreading these ideas. I run the baseline IV specification at the regional level for total number of mentions and for the total number of mentions in regional sources separately[10]. To control for the difference in media coverage between regions and over time, I add the first principal component of the shares of population who have an access to analog and digital TV, and the number of published newspapers per capita. Next, I investigate whether controlling for this specific media presence of Church in the main model disturbs the effect of the Church network on the approval of the president established in Table 2.1.

The results of the analysis are presented in Table 2.4. Columns (1) and (2) suggest that the denser church network increases the propaganda on Internet and federal TV channels, radio stations, and in newspapers. This is an expected effect, because the ROC

[10]Following Belmonte and Rochlitz (2019), I divide all numbers of mentions by the total number of weather reports to account for the differences in salience of a particular topic studied in the media by region and year.

receives financial support primarily from the federal budget, and Internet, if available, is a more easily reachable platform for newly established religious organizations than regional media outlets. At the same time, as column (3) presents, promoting traditional family values on Internet and federal outlets does not affect the approval of the president. This result suggests that social propaganda in media is not the channel through which the Church influences political preferences. Meanwhile, column (4) shows that regional media sources are able to shift the approval rating. However, this channel is apparently not exploited by the Church.

Table 2.4: The density of orthodox religious organizations and media

	Mentions, scaled		Approval of president	
	(1)	(2)	(3)	(4)
	total	regional	with total mentions	with regional mentions
Orthodox density	6.546*	-0.207	0.875**	0.874**
	(3.289)	(0.258)	(0.336)	(0.336)
Total mentions, scl			-0.0005	
			(0.001)	
Regional mentions, scl				0.006**
				(0.003)
Media coverage	✓	✓	✓	✓
Individual controls			✓	✓
Regional controls	✓	✓	✓	✓
Region FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓
Kleibergen-Paap F	30.617	30.617	11.456	11.415
Anderson-Rubin 90% CI	[1.424, 12.207]	[-0.694, 0.153]	[0.349, 1.567]	[0.348, 1.566]
N	1,820	1,820	35,334	35,334

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of a 2SLS analysis with the scaled number of mentions (columns (1) and (2)) and a dummy for approval of the president (columns (3) and (4)) as a dependent variable. All models include the regional media coverage index in addition to the baseline controls. Standard errors in parentheses are clustered by region.

2.6 Conclusion

This paper studies the influence of the Orthodox Church network in Post-Soviet Russia (measured by the regional density of Orthodox organizations) on individual political preferences and election results in 1997-2019. I apply an IV strategy, constructing a Bartik-style instrument. The instrument captures the overall presence of the Russian Orthodox Church in the country in a given year, but this presence is assumed to have a

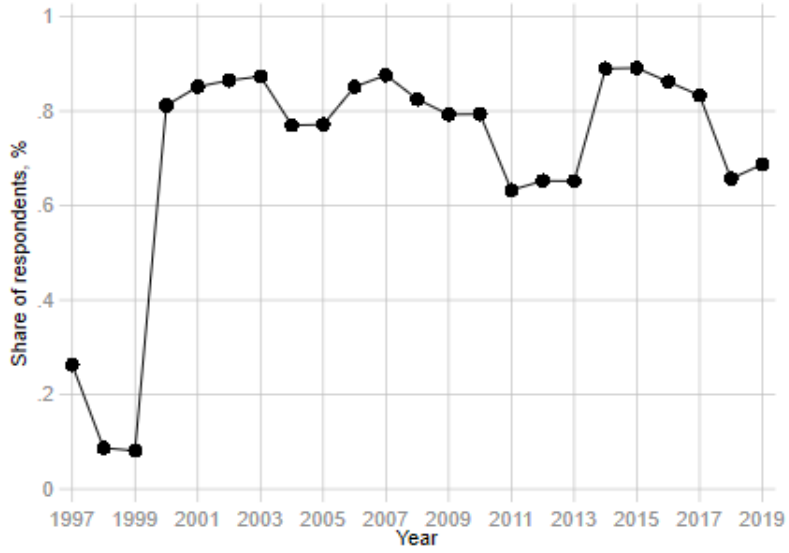
greater impact in regions with more historical religious markers (the Orthodox monasteries operated in the Russian Empire before the Revolution).

I find that a denser Orthodox Church network does increase the average local approval rating of the current president and the shares of votes for the government candidate in presidential elections. At the same time, there is no evidence of any effect of the Church on trust in president or on the political popularity of other branches and levels of the government (regional governor, ruling party, Government, and Duma).

Further analysis of potential mechanisms behind these results suggests that the Church today is struggling to increase the numbers of "true" believers who genuinely subscribe to its tenets. Instead, it more effectively plays a nation-building role: the ROC attracts the attention of those who, regardless of their faith in God, self-identify as Orthodox, because Orthodoxy is strongly associated in their minds with being Russian. The majority of these people approve of the ruling leader's actions, and the Church plays an important role in strengthening their political preferences for the Government's preferred candidate. Since only a small share of the population regularly attends church and is exposed to the propaganda on site, the ROC needs to find other channels for persuading. One such channel could be media appearances by church officials, but I do not find sufficient evidence of this in my study that leaves a room for further investigation along these lines.

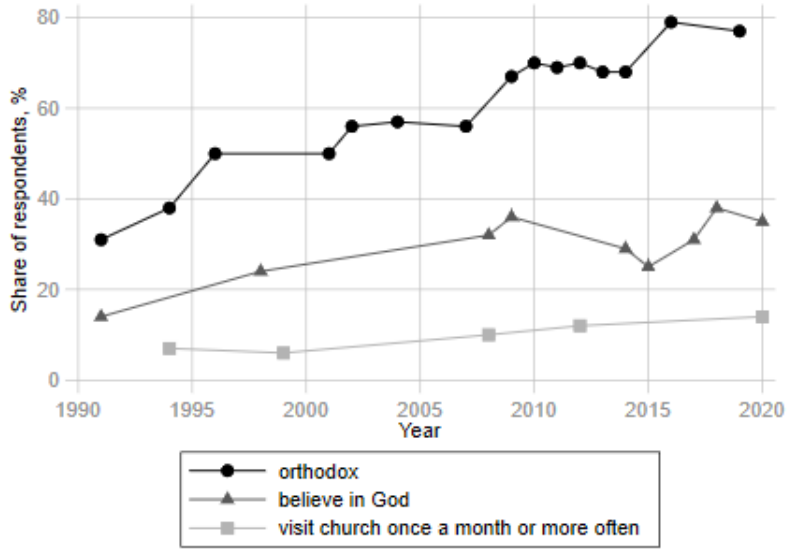
2.A Appendix: Supplemental Figures

Figure 2.1: Approval of the current president



Note: The graph shows the average approval rating of the current president by year. The first significant shift in the approval in 2002 is associated with Putin being elected president for the first time, and the second, in 2014, is linked to the annexation of Crimea.

Figure 2.2: The shares of Orthodox Russians, believers, and "churched" believers



Note: The graph shows the average shares of those who self-identify as Orthodox, believe in God, and visit church once a month or more often. It uses aggregated data from an annual report by the Levada Center (Zorkaya, Gudkov, and Mihaleva 2021).

2.B Appendix: Supplemental Tables

Table 2.1: Summary statistics

	Mean	SD	N	Years
Regional variables:				
Density of orthodox org.	0.104	0.077	1,840	1997-2019
Density of muslim org.	0.019	0.047	1,840	1997-2019
Density of other relig. org.	0.056	0.046	1,840	1997-2019
Density of 1908's monasteries	0.007	0.008	1,840	1997-2019
Density of 1908's monks and nuns	0.545	0.610	1840	1997-2019
Log of real GDP	16.078	1.290	1,830	1997-2019
Unemployment rate	9.122	6.429	1,831	1997-2019
Population, thsd	1800.763	1675.160	1,840	1997-2019
Share of votes for gov. candidate	0.671	0.118	400	2000, 2004, 2008, 2012, 2018
Share of votes for ruling party	0.512	0.164	319	2003, 2007, 2011, 2016
Share of votes, combined	0.601	0.161	719	2000, 2003, 2004, 2007, 2008, 2011, 2012, 2016, 2018
Mentions in reg. sources, scl	0.058	0.307	1,840	1997-2019
Total mentions, scl	12.740	13.423	1,840	1997-2019
Media coverage index	-0.000	1.071	1,829	1997-2019
Individual variables:				
Approval of president	0.705	0.456	35,395	1997-2019
Approval of gubernator	0.595	0.491	28,666	2000-2016, 2018, 2019
Approval of Government	0.493	0.500	30,054	1999-2016, 2018, 2019
Approval of Duma	0.420	0.494	12,556	2011-2016, 2018, 2019
Trust in president	0.565	0.496	23,177	2000-2016
Vote for gov. candidate	0.492	0.500	19,008	1997, 1999-2003, 2005-2007, 2009-2012, 2014, 2017, 2019
Vote for ruling party	0.454	0.498	15,545	2002-2007, 2010-2012, 2014, 2017, 2019
Trust in Putin	0.595	0.491	23,177	2000-2016
Vote for Putin	0.596	0.491	16,679	1999-2003, 2005, 2006, 2009-2012, 2014, 2017, 2019
Female	0.547	0.498	36,332	1997-2019
Age	44.814	16.809	36,332	1997-2019
Higher education	0.226	0.418	36,332	1997-2019
Employed	0.589	0.492	36,276	1997-2019
Rural	0.249	0.433	36,332	1997-2019
Orthodox	0.718	0.450	8,542	2003, 2007, 2012, 2013, 2015, 2018
Other denominations	0.152	0.359	8,542	2003, 2007, 2012, 2013, 2015, 2018

Table 2.2: Correlations between the density of monks and nuns in 1908 and regional characteristics in 1990

	Density of monks and nuns	
	(1)	(2)
	without district FEs	with district FEs
Fixed capital investments, pc	-322.014**	-101.941
	(135.847)	(109.318)
Income, pc	-0.025***	-0.017
	(0.009)	(0.011)
Employment rate	-4.010	-1.713
	(3.744)	(1.693)
Housing, sq.m pc	1.727***	0.542
	(0.331)	(0.375)
Urban population	-0.013	-0.064*
	(0.021)	(0.034)
Paved roads, km per sq.km	3.935	2.633
	(2.502)	(3.035)
Elderly population	5.275***	1.755**
	(0.874)	(0.750)
Women	1.566***	0.368
	(0.257)	(0.222)
Birth rate	-2.171***	-0.374
	(0.512)	(0.542)
Life expectancy, years	0.606**	0.040
	(0.248)	(0.220)
Students, pc	-6.101	-32.548
	(12.610)	(34.323)
Museum visits, pc	156.739	-372.635
	(135.690)	(348.994)
Theatre visits, pc	-34.835	-126.432*
	(24.612)	(64.109)
Published newspapers, pc	-4.2e+04	-2.1e+05
	(3.6e+04)	(2.1e+05)
Marriage rate	-0.533***	-0.239
	(0.127)	(0.161)
Divorce rate	-0.490***	-0.297
	(0.181)	(0.184)
Crime rate	-198.238***	49.023
	(65.033)	(69.570)
P-value of the joint significance test	0.000	0.143

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: All coefficients are from simple cross-sectional regressions of regional characteristics in 1990 on the density of monks and nuns in 1908. The model in column (2) also includes economic district fixed effects. Robust standard errors are in parentheses. P-values in the last row are calculated within the F-test of joint significance of factors in the regressions of the density of monks and nuns on all regional characteristics without (column (1)) and with (column (2)) economic district fixed effects.

Table 2.3: The density of Orthodox religious organizations and approval of regional governor (gubernator), Government, and Duma

	Approval of gubernator	Approval of Government	Approval of Duma
	(1)	(2)	(3)
Orthodox density	1.941	0.115	4.839*
	(1.559)	(0.692)	(2.779)
Individual controls	✓	✓	✓
Regional controls	✓	✓	✓
Region FEs	✓	✓	✓
Year FEs	✓	✓	✓
Kleibergen-Paap F	20.091	18.628	9.893
Anderson-Rubin 90% CI	[-0.244, 4.897]	[-1.083, 1.312]	[1.407, 12.389]
N	28,612	30,001	12,556

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of a 2SLS analysis of the effect of Orthodox density on the approval rating of gubernator (regional governor, column (1)), Government (column (2)) and Duma (column (3)). Standard errors in parentheses are clustered by region.

Table 2.4: The density of Orthodox religious organizations, trust in the president, and electoral preferences

	Trust in president	Vote for gov. candidate	Vote for ruling party
	(1)	(2)	(3)
Orthodox density	-0.612	0.514	0.735
	(1.563)	(0.651)	(1.126)
Individual controls	✓	✓	✓
Regional controls	✓	✓	✓
Region FEs	✓	✓	✓
Year FEs	✓	✓	✓
Kleibergen-Paap F	15.642	10.662	21.015
Anderson-Rubin 90% CI	[-3.572, 1.8322]	[-0.3392, 1.658]	[-0.842, 2.868]
N	23,128	17,062	15,505

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of a 2SLS analysis of the effect of Orthodox density on trust in the current president (column (1)), readiness to vote for the government candidate in presidential elections (column (2)) or for the ruling party in Duma elections (column (3)). Standard errors in parentheses are clustered by region.

Table 2.5: The density of Orthodox religious organizations and election results

	Shares of votes			
	(1) for gov. candidate	(2) for ruling party	(3) combined	(4) combined
Orthodox density:	0.090	-0.295	-0.091	
	(0.353)	(0.678)	(0.394)	
2000, presidential election				0.926*
				(0.540)
2003, Duma election				0.608*
				(0.343)
2004, presidential election				0.444
				(0.366)
2007, Duma election				0.410
				(0.288)
2008, presidential election				0.585**
				(0.288)
2011, Duma election				0.236
				(0.301)
2012, presidential election				0.395
				(0.268)
2016, Duma election				0.320
				(0.317)
2018, presidential election				0.600**
				(0.286)
Regional controls	✓	✓	✓	✓
Region FEs	✓	✓	✓	✓
Year FEs	✓	✓	✓	✓
Kleibergen-Paap F	26.781	20.588	24.935	8.474
Anderson-Rubin 90% CI	[-0.516, 0.638]	[-1.459, 0.869]	[-0.834, 0.522]	
N	398	318	716	716

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of a 2SLS analysis. Presidential elections (in 2000, 2004, 2008, 2012, 2018) are covered in column (1), Duma elections (in 2003, 2007, 2011, 2016) - in column (2). The dependent variable in columns (3) and (4) is pooled shares of votes for government candidate or ruling party. The model in column (4) interacts Orthodox density with the dummy for each year and instruments these interactions with interactions of the instrument with the same dummies. Standard errors in parentheses are clustered by region.

Table 2.6: The density of Orthodox religious organizations and Putin

	Approval of president	Trust in Putin	Vote for Putin
	(1)	(2)	(3)
Orthodox density:		-0.675	0.803
		(1.555)	(0.702)
Yeltsin period	1.776		
	(1.100)		
Putin period	1.093**		
	(0.511)		
Medvedev period	1.419**		
	(0.545)		
Individual controls	✓	✓	✓
Regional controls	✓	✓	✓
Region FEs	✓	✓	✓
Year FEs	✓	✓	✓
Kleibergen-Paap F	6.290	15.642	19.863
Anderson-Rubin 90% CI		[-3.363, 1.757]	[-0.180, 2.133]
N	35,341	23,128	16,651

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of a 2SLS analysis of the effect of Orthodox density on the approval rating of the current president (column (1)), trust in Putin (column (2)) and readiness to vote for Putin (column (3)). The model in column (1) interacts Orthodox density with the period dummy for the presidency of Yeltsin (1997-1999), Putin (2000-2003, 2008-2019), Medvedev (2004-2007), and instruments these interactions with interactions of the instrument with the same dummies. Standard errors in parentheses are clustered by region.

Table 2.7: Robustness checks

	Approval of president			
	(1) year x fed. unit FEs	(2) clusters by year x fed. unit	(3) fed. unit FEs, robust s.e.	(4) without Moscow, St.Petersburg
Orthodox density	1.301***	0.840**	0.247***	0.690*
	(0.399)	(0.385)	(0.091)	(0.397)
Individual controls	✓	✓	✓	✓
Regional controls	✓	✓	✓	✓
Region FEs	✓	✓		✓
Year FEs		✓	✓	✓
Fed. unit FEs			✓	
Year x Fed. unit FEs	✓			
Kleibergen-Paap F	5.234	10.562	8534.105	9.679
Anderson-Rubin 90% CI	[0.808, 2.843]	[0.237, 1.634]	[0.104, 0.390]	[0.069, 1.507]
N	35,341	35,341	31,498	35,341

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of a 2SLS analysis with various modifications of the baseline specification (1): column (1) - year x federal unit fixed effects are instead of year fixed effects; column (2) - standard errors are clustered by year x federal unit in addition to region; column (3) - federal unit FEs are instead of region FEs, standard errors are robust; column (3) - Moscow and St.Petersburg are dropped. Standard errors in parentheses are clustered by region in columns (1), (4) and by regions and year x federal unit - in column (2).

Chapter 3

Economic Disruption, Life Satisfaction, and Political Attitudes

Co-authored with Andreas Menzel (CERGE-EI) and Christoph Koenig (University of Bristol)

3.1 Introduction

The rise of populist sentiments, movements, and parties in Central and Eastern Europe over the last decade, which are challenging existing liberal democracies in many regions in the world, has been attributed to a number of different causes, from economic uncertainty caused by the great recession, to overall increasing inequality, or, particularly in Europe, to the arrival of large numbers of refugees in 2015 (The Economist 2014). Often, these mechanisms are assumed to interact with long-term adverse effects of older shocks, for example, those caused by economic displacement or war (Fouka and Voth 2016; Ochsner and Roesel 2017). In the context of Central and Eastern Europe, disrupted work histories during the transition period after the fall of the communist regimes in 1989-91 have been discussed as a possible source of such lingering sentiments (Heyns 2005; Bell 2001). León-Ledesma and McAdam (2004) and Cuestas, Gil-Alana, and Staehr (2011) documented persistent and lingering unemployment in the transition countries. However, evidence on how personal experiences during the transition period in Central and Eastern Europe (henceforth CEE) affects current day attitudes, life satisfaction, and political preferences remains scarce.

This paper studies these long-run effects of personal experience of work-life disruption during the transition period after the fall of communism in the 11 former communist countries that have since joined the European Union. Our key outcome variable of interest is life satisfaction. We augment the analysis with additional analyses of similar long-run effects on economic outcomes (income, assets), various health indicators, and locus of control, to understand whether career disruption during the transition period induced a persistent sense that life is shaped by forces outside of a person's control. In addition, we investigate whether the long-lasting effects on various life outcomes can translate into effects on political left-right orientation. We indeed find negative effects of career displacement during the transition period on current-day life satisfaction. We also document a number of negative long-run effects on marital status, perceived control over life, and some health outcomes (likelihood of drinking and smoking) which potentially present the mechanisms behind the effect on life satisfaction. We find little negative effects in our data, however, on economic outcomes such as income. Our analysis also suggests that people who experienced disruption during the transition period tend to locate themselves more to the right on the left-right political continuum.

Our use of the SHARE data (Survey of Health and Retirement in Europe) allows us to estimate these effects across all former communist countries that have since joined the European Union. We therefore extend the analysis of long-run effects of the transition period beyond what has been done for individual countries so far. Our results are therefore less susceptible to idiosyncratic developments of individual transition countries (Roland 2000), where, for example, job losses could be concentrated in specific industries with selected workers. For example, Myck and Oczkowska (2018) use SHARE data for Poland only, to show that unemployment experience during the transition is correlated with worse economic outcomes 20 years later, but not with life satisfaction, differently to what we find for the overall CEE sample.

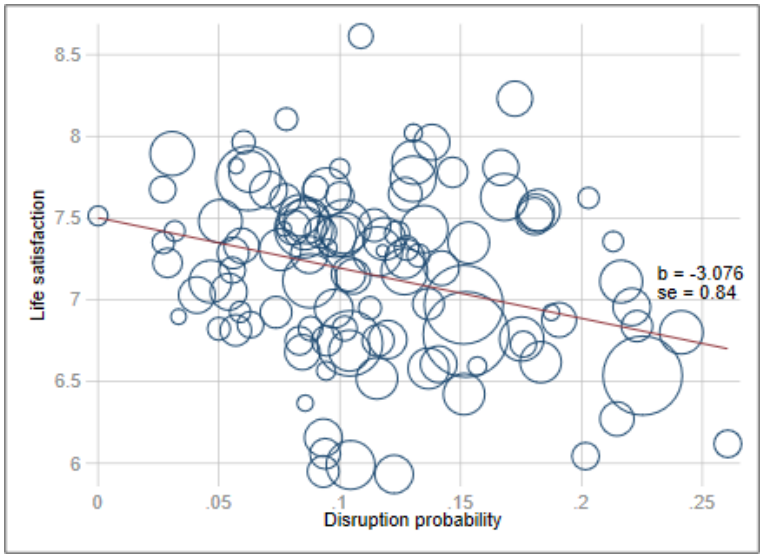
Our core independent variable of interest is the share of persons in the local sector of a given survey respondent, whose work history was disrupted during the transition years 1989-1995. We prefer this variable over a purely personal indicator on whether a person experienced a disruption, as our main outcomes of interest, life satisfaction, and political orientation are likely not only affected by a person's own work history, but also by the experience of seeing colleagues losing their job, of fearing job loss over a long term, or of management change and downsizing at one's site of employment. The probabilities of all these events was likely increasing in the share of employees in the local sector losing their

job. We perform robustness checks also using the personal disruption experience as an explanatory variable, and find a significant effect which is, however, of a lower magnitude.

Figure 3.1 documents the strong basic negative relationship between average life satisfaction and the regional share of persons who experienced disruption in their work history during the transition period. We define what we mean by disruption to a person's work history in more detail in the data section below, though broadly speaking, we mean that the person lost the job in which she or he was working just before the onset of the transition. However, this basic relationship may be driven by third factors (Jurajda and Terrell 2009). To estimate the causal effect, we employ an identification strategy that rests on multiple parts. First, the rich SHARE data allow us to control for many potential confounders, including education, age, and rural versus urban background. Second, the planned economy of the pre-transition period typically did not allow self-selection into jobs and sectors to the same extent as modern market economies do. Such self-selection could be correlated with personal traits that may also affect our outcomes. Third, our main source of variation is average unemployment experience among persons in the same industry and region. Personal unobserved characteristics that affect a person's probability of experiencing a disruption as well as later life satisfaction, conditional on the local industry the person worked in at the time of transition, are thus not a threat to our analysis. Finally, we predict a person's probability of working in different sectors based on a small number of personal characteristics and region dummies, and combine the resulting probabilities with country wide probabilities that workers in these sectors experienced disruptions. This eliminates threats from unobserved personal characteristics that could both push persons into a sector with higher or lower disruption probabilities during the transition, and that could be correlated with our outcome variables.

In addition to the literature on the long-run effects of communism and the transition period after its fall (Myck and Oczkowska 2018; Guriev and Melnikov 2018; Fuchs-Schündeln and Schündeln 2020; Otrachshenko, Nikolova, and Popova 2021), we contribute to the broader literature on the long-run consequences of experiencing economic shocks such as unemployment. Jacobson, LaLonde, and Sullivan (1993), Eliason and Storrie (2006), Couch and Placzek (2010), Schmieder, von Wachter, and Heining (2018) are only some of many papers documenting that employees who lose their job tend to experience long-run earning losses. Interestingly, we do not find negative effects on income or assets in our data. A closely related literature has documented persistent effects of job loss on health and mortality (Sullivan and Von Wachter 2009; Eliason and Storrie 2009; Brown-

Figure 3.1: Life satisfaction and disruption probability by the regions of the country



Note: The graph presents the mean life satisfaction and disruption probability by country region (with region as defined in the SHARE data). The size of each bubble is proportional to the number of respondents in particular region.

ing and Heinesen 2012; Currie, Duque, and Garfinkel 2015), marital stability (Charles and Stephens 2004), and fertility (Huttunen and Kellokumpu 2016). We also find that workers who experienced higher rates of disruption in their local sector score worse on a number of health outcomes, notably the risk of smoking and drinking to excess. We also find a higher risk of divorce or remaining single.

A small but growing part of this literature on the consequences of economic shocks studies the effects of unemployment on people's psychological functioning. One of the personality traits for which the empirical results are still mixed is locus of control - an individual's belief regarding his or her capability to influence his or her own life circumstances. For example, Cobb-Clark and Schurer (2013) and Infurna et al. (2016) find that perceived control remains relatively stable over time, even around major life events including job loss. Meanwhile, Preuss and Hennecke (2018) document a significant but short-term negative effect of unemployment on perceived control, while Legerski, Cornwall, and O'Neil (2006) estimate a positive effect. In contrast, we find a long-lasting negative impact of economic disruption on people's beliefs regarding their control over their own lives.

These and other factors could serve as mechanisms behind the heterogeneous impact of unemployment on various measures of subjective well-being, which is currently a "hot" topic. Thus, some scholars document a significant role of non-pecuniary factors such as

psychological distress, social work norms, and so on (Stutzer and Lalive 2004; Shields and Price 2005; Kassenboehmer and Haisken-DeNew 2009), while others suggest that the main cause is actually pecuniary (Bayer and Juessen 2015; Luo 2020). In addition, there could be a heterogeneity of the effect by gender, age, education, and other demographic characteristics (Green 2011; Gathergood 2013). We study the long-term consequences and, in this context, we do not find support for a pecuniary nature of the negative effect of job loss on life satisfaction. Documenting the adverse impact of unemployment on subjective well-being for men (primarily, without university degree) but not for women, we show that this could be due to the negative effect of unemployment on marital status and perceived control, which is greater for men.

Our study is also connected to a different literature that shows that areas in the U.S. where the local manufacturing sector was more exposed to import competition from China subsequently experienced higher unemployment, lower marriage rates, lower fertility, higher rates of political polarization, and more votes for populist politicians, particularly from the right (Autor, Dorn, and Hanson 2013; Autor, Dorn, and Hanson 2019; Autor et al. 2020). We find similar long-run shifts on marriage rates and right-wing attitudes among persons in Central and Eastern Europe who were more exposed to displacement in the transition period after the fall of communism. This connects to work by Grosjean, Ricka, and Senik (2013), who showed that the negative shock of the Great Recession from 2007 onwards reduced support for democracy and a market economy in the more advanced transition economies of Central and Eastern Europe, while leading to increased support in the less advanced post-Soviet Union countries.

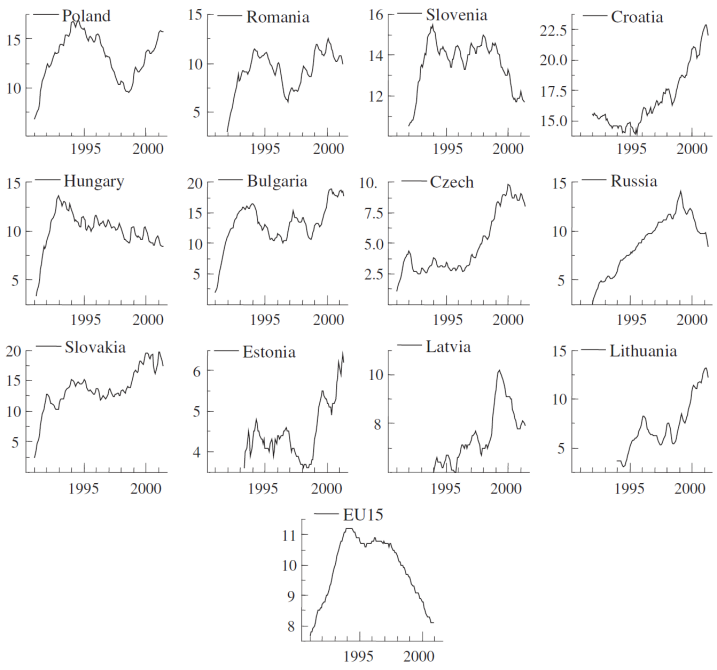
The rest of the paper is organised as follows. The background and data are described in Sections 3.2 and 3.3. In Section 3.4, we present the empirical strategy. Section 3.5 provides the results on the long-term effects of transition disruption on life satisfaction, and Section 3.6 investigates the mechanisms behind these results. Section 3.7 discusses the effects on political attitudes, and Section 3.8 concludes.

3.2 Background

The transition of the planned economies of the former communist countries of Central and Eastern Europe starting around 1989 to 1991 can be considered among the most momentous worldwide economic events of the twentieth century, completely changing the economic conditions of the populations of these countries (Roland 2000). An initial

recession during the first years of the transition led to a decrease of the combined GDP of the Central and Eastern European former (non-Soviet Union) communist countries of 15% (Mitra and Selowsky 2002)[1]. One decade into the recession, only two countries (Poland and Slovenia) had managed to recover their total GDP from 1989. Nevertheless, as in all CEE countries, there have been still fewer people working than in 1989, higher rates of poverty, and substantial increases in economic inequality (Heyns 2005). Figure 3.2, taken from León-Ledesma and McAdam (2004), shows the evolution of unemployment rates in 11 CEE countries and Russia, plus those of the EU-15 for comparison. A strong and sustained increase in unemployment is visible for all countries. Before the transition, unemployment was almost non-existent in the former planned economies, due to the political goals of ensuring full employment, as well as labor hoarding by firms to ensure that output targets could be met (Cuestas, Gil-Alana, and Staehr 2011).

Figure 3.2: Unemployment rates in post-communist countries (from León-Ledesma and McAdam (2004))



Economists were generally surprised by huge falls in output after the liberalization of the economies and the rather sluggish recovery afterwards (Roland 2000). The share of industry in output in the CEE countries fell from 45% to 33% in the first decade of transition, releasing large numbers of workers that struggled to find employment in the

[1]The recession was even more severe in the former Soviet-Union countries, though these countries are not the focus of this study.

new businesses in the service sector; this sector's share in GDP surpassed 50% by 1989 (Mitra and Selowsky 2002). Inequality increased in all CEE countries by at least five Gini-points (except in Croatia, where it fell; see Mitra and Selowsky (2002)). Generally, inequality increased more in countries that experienced larger falls in GDP. The social repercussions of the transition were generally worsened, as social systems dealing with unemployment, poverty, child care, and health had to be largely established anew, as in the previous economies social security was provided through full employment and through the state enterprises in which people were employed (Roland 2000). Life expectancy and many health indicators worsened significantly during the transition, in particular for middle-aged men (Watson 1995), suicides increased in every transition country (Mäkinen 2000), birth rates collapsed and only slowly began to recover a decade into the transition (Sobotka 2011).

3.3 Data

3.3.1 The SHARE Data

We use SHARE (Survey of Health and Retirement in Europe) data from survey waves two (2006/7) to seven (2017), and focus on the 11 Central and Eastern European countries that are members of the European Union, and thus covered by the data.[2] SHARE is an unbalanced panel of individuals. To the extent that people exit the panel due to death or other reasons, new individuals are sampled and added to the panel. Generally, people newly included into the panel are at least 50 years old, though a small number of respondents (<1% of the sample) is between 40 and 50, because the partners of sampled individuals are also interviewed. This age structure of the survey is ideal for our research question, to study the effects of the transition shocks around and just after 1989 on current day outcomes. For example, a 50 year old respondent in wave 2 of the survey in 2006 was 33 in 1989, and a 50 year old respondent in wave 7 in 2017 was 22 in 1989. We drop respondents who were under 16 years old in 1988, to include only persons who were of working age during the transition. Generally, we only include respondents who were working in 1988, as only these respondents could have experienced a disruption in their work histories in the ensuing years.

[2]Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia.

Persons are asked in each survey wave about life satisfaction, and a number of questions on their health and economic situation. Other questions, such as about political orientation on the left-right spectrum are only asked in a sub-set of survey waves, and which survey waves contain these questions can differ from country to country (Table 3.1, Appendix 3.A). Furthermore, not all countries are included in all survey waves. Generally, the coverage of countries follows the expansion of the European Union over time. Thus, for example, Romania, Bulgaria, and Croatia were not included in the first survey waves, as they joined the European Union after 2006. Further, some counties skipped some survey waves. Only survey wave 7 includes all countries in our sample. Thus, for each individual, we take averages over his or her responses to our key outcome and control variables across all waves in which the individual was surveyed. However, our results are robust to using only the data collected from survey wave 7.[3] Moreover, we always control for country fixed effects, and thus only compare individuals from the same country, with similarly collected data, with each other.

In addition to the standard survey waves, at some selected waves, all individuals in the panel go through a longer ShareLife survey module that collects more background information about these persons. In the countries covered by our data, these modules were conducted in wave 3 and 7 (conditional on the country generally participating in the SHARE surveys by these waves). Importantly, each respondent is supposed to go only once through this ShareLife module. Thus, an individual still in the panel by wave 7, who already completed the ShareLife module in wave 3 will not complete that module again in wave 7.

3.3.2 Employment Histories

We use the information collected in the ShareLife modules to reconstruct the full work history of the respondents. The ShareLife module asks respondents to go chronologically through every job s/he has ever had, and to report for each the start and end year, the sector and type of job, the reason why the job ended (resigned, laid-off, establishment closed, retired,...), the wage at the start of the job, and what the person did right after the job (started another job, unemployed, self-employed,...). From these answers, we isolate

[3]We checked if responses by the same individual to questions such as life satisfaction or left-right orientation follow trends over time, but did not find this to be the case. First differences in these responses seem to follow a random process. We thus decided to average over all available responses by the individuals for these outcomes, in order to increase precision in measuring these variables.

the job that the person had in 1988, right before the start of the transition period, and its sector, and create an indicator variable to identify whether the person experienced a *disruption* when this job ended before 1996. We define a disruption having occurred to a respondent if his or her job held in 1988 ended in a lay-off, with the establishment closing down, or was followed by a spell of unemployment after the job ended (even if the reason that the job ended was not due to lay-off or establishment closure).[4]

Finally, in the same way that the ShareLife surveys collect retrospective work histories for all respondents, it also collects information allowing researchers to reconstruct the full personal history of a respondent in terms of which regions the person lived in. Persons were asked where they were born, and until which year they lived there, unless they still live in the same region. If they moved to another region, they are asked from which to which year they lived in that region, and so on. This geographical information is standardized by SHARE into regions that closely resemble, but are not identical to, NUTS-3 regions. In the remainder of the paper, we refer to these geographical units simply as "regions", and mark for each person the region in which s/he lived in 1988, in the same way that we mark the characteristics of the job the person had in that year.

3.3.3 Outcome Variables

We study the effects of labor market disruption on a number of outcome variables. Among our main attitudal outcomes is life satisfaction, which is measured on a 0-10 Likert scale, with higher values indicating higher life satisfaction. Left-right political orientation is measured on a similar 11-point Likert scale, with higher values indicating a more right-wing orientation. Additionally, we construct a binary indicator for respondents who are on the right side of this scale (choose a number between 6 and 10).

Socio-economic outcomes available in the survey that we use are household income and assets, to which we apply an inverse hyperbolic sine transformation (IHST), indicator for respondents without children and respondents who have never been married or have ever been divorced.

Our set of physical and mental health variables from the SHARE data includes self-perceived health status, numbers of chronic diseases, number of doctor visits, indicator

[4]Note that the available data provides detailed information on what people did after a job ended. Thus, we can separate people being unemployed after a job ended from people who cared for family members or their home after a job ended, were sick or disabled, or engaged in further education or training.

for hospital stay(s), quality of life and depression scores, frequency of drinking, indicators for respondents who ever smoked daily, and respondents who have overweight.

The psychological factor available in the survey is locus of control measured on a 4-point Likert scale, with higher values indicating more control. The particular question which is given to respondents in this case is "How often do you feel that what happens to you is outside of your control?".

3.3.4 Summary Statistics

As shown in the Summary Statistics Table 3.2, 12.3% of people in our core sample experienced a disruption, as defined above. The shares are more or less identical for men and women, with women making up 55% of our sample. The share of people experiencing a disruption varies between 7.5% for Slovenia and 19.9% for Latvia. When looking at the 14 different sectors into which jobs are sorted in the SHARE data, disruption rates vary between 2.9% in Health and social work, and 18.3% in Agriculture, hunting, forestry, and fishing. In the largest sector in our sample, Manufacturing in which 26% of persons in our sample worked in 1988, disruption rates are 14.5%.

On a 0-10 Likert scale, respondents in our sample report an average life satisfaction of 7.13. The difference between the average satisfaction of 7.22 for male respondents and 7.06 for female respondents is highly significant, also when controlling for country or country-sector fixed effects ("sector" being the sector of employment in 1988). Life satisfaction is lowest in Bulgaria, with an average of 6.28 followed by Lithuania with 6.53, and highest in Slovakia 7.68, followed by Poland with 7.55. Controlling for country fixed effects, satisfaction is lowest among people working in Agriculture in 1988 (6.78), followed by Real estate & business (6.92) and Manufacturing (6.95), with highest values among those who worked in Public administration & defence (7.37) and in Education (7.36).

As mentioned above, political left-right orientation is also measured on a 0-10 Likert scale, with larger numbers indicating more right-wing attitudes. In the six countries for which we have this data, men report an average orientation of 5.02, and women an insignificantly lower average of 5.01. Values are lowest in Slovenia (average 4.64) and highest in Poland (5.57). It is lowest among those who worked in Mining and quarrying (4.47) and Public administration (4.68) in 1989, and highest among those in Hotels and gastronomy (5.23) and Health and social work (5.22). Meanwhile, self-evaluated control

on the 4-point Likert scale is 2.88 among men, while among women, it is a significantly lower (2.80). Perceived control is lowest in Lithuania (2.21), and highest in Slovenia (3.23).

3.4 Empirical Strategy

3.4.1 Measuring Transition Exposure

We define transition exposure $\tau_{i,src}$ for respondent i as the share of people living in the same region r in country c and working in the same sector s as individual i, who experienced a *disruption* as defined above during 1989-95. Given the absence of adequate unemployment registry data for the countries and time period studied, we approximate these shares via the sample moments in the SHARE data (excluding i in each case). Region and country of residence are approximated by i's residence, while the employment sector is one of the 14 categories used in the SHARE data:

$$\tau_{irs} = P(u_{1,-i}|R = r_i \cap S = s_i) = P(u_{1,-irs}) \tag{3.1}$$

We use the continuous measure τ as our main explanatory variable instead of a simple dummy variable u_i indicating that person i experienced a disruption for several reasons. First, lay-off decisions during the transition period were often determined by external shocks at the firm- or sector-level. While individual characteristics certainly also affected who did/not experience a disruption, we are primarily interested in studying the effects of larger shocks that affected whole industries in a certain region, as well as individual factors.

Second, this variable captures a wider set of mechanisms through which transition experience can affect attitudes later in life; not solely through personal disruption experience, but potentially through observing colleagues losing their jobs in the industry. A person may not have ultimately lost his or her job during the transition, but still may have spent years worrying if his or her job would suddenly disappear. Similarly, one may have experienced downsizing at work, and/or witnessed friends and family losing their jobs. Work intensity may have increased in sectors in which many workers lost their jobs, or a respondent may have experienced lower wage growth than expected.

Third, by varying at the region-sector level instead of the individual level, this vari-

able helps our identification strategy by shutting down the effect any omitted variables that affect both our long-run outcomes, and the probability of losing a job in the post-transition period conditional on the regional sector of employment pre-transition. Only variation at the sector-region level is exploited.

3.4.2 Instrumental Variable Approach

Even though our measure of transition exposure is not dependent on micro-level factors at the firm- or individual level, it still leaves us with unobservable factors that could be correlated with the pre-transition sector-region cell of a respondent as well as our long-term outcomes. We first note, however, that such concerns may be slightly less worrying in our context of Socialist Eastern Europe. Generally speaking, the choice of employment sector was more limited in command economies. For instance, access to higher education, and thus to a variety of jobs, was highly restricted and conditioned on acquiescence with the regime. In addition, the state economy preferred to create larger firms which were easier to manage (Roland 2000). This resulted in many smaller towns having a single firm as their sole main employer which, again, restricted sectoral employment choice for many workers (Heyns 2005). Moreover, unemployment was practically non-existent before the transition, and wage fluctuations were kept to a minimum. The typical sorting of employees to sectors based on notions of job security or career possibilities under market economies was thus, at best, very limited (Roland 2000).

While the above points may alleviate endogeneity concerns somewhat, they leave some important problems unaddressed, while opening up others. For instance, one cannot rule out that ambitious individuals still sorted for some reasons into sectors in which Socialist countries were on a par or even ahead of their capitalist counterparts, and in which individuals thus experienced a lower (or maybe higher) disruption probability after the transition. In addition, state control over university access meant that, conditional on ability, conformism translated into higher chances of ending up in more advanced sectors of the economy. These examples show that, even under state Socialism, one cannot rule out that people with particular personality traits selected before the transition into sectors with different probabilities of job disruptions 1989-1995, and that these traits may have also affected their life satisfaction and political attitudes 20 years later.

To address these remaining concerns, we instrument τ_{irs} with predicted transition exposure based on a number of essential, pre-determined and observable characteristics

of respondent i, including his or her education, gender, birth cohort, and pre-transition region of residence. We use multinomial logit estimation to predict the probability $\gamma_{isc,-i}$ that respondent i worked in one of the 14 sectors s from the SHARE classification. We then combine these 14 probabilities with country-wide probabilities that workers in sector s and country c experienced a disruption, as follows:

$$e_{ic} = \sum_{s} \gamma_{isc,-i} w_{sc,-i} \quad , \tag{3.2}$$

In a nutshell, e_{ic} is the inner product of individual i's probabilities of working in a particular sector $\gamma_{isc,-i}$ and the sector-specific disruption probabilities $w_{sc,-i}$ for individuals residing outside of i's home region. The employment probabilities $\gamma_{isc,-i}$ are obtained from estimating a multinomial logit model of sector choice for each country in our sample, using as inputs fixed effects for respondents' demographic group defined by education, gender, and birth cohort as well as pre-transition region of residence. Since having too few observations in cells at the intersection of the demographic group or region with the sector could bias the probability estimates, we drop all respondents whose combination of sector-demographic group or sector-region appears only once in the sample. Sector-specific disruption probabilities $w_{sc,-i}$ are calculated in the same way as τ_{irs} after dropping respondents from other countries and those living in the same region as i.

Our strategy follows Anelli, Colantone, and Stanig (forthcoming) who also use multinomial logit models to estimate the likelihood of working in occupations affected more or less by automation. One of the main differences in our setup is that the data does not allow us to estimate the sector choice model out of a secondary dataset. In order to rule out that actual sector choices can directly affect predicted choices $\gamma_{isc,-i}$, we run the multinomial models for each worker i individually while omitting her from the estimation. Similarly, we also omit i from the calculation of $w_{sc,-i}$.

We then use e_{ic} as an instrumental variable for $\tau_{i,src}$. In order to rule out that the instrument picks up the direct effect of the variables included in the multinomial model, we additionally control for all factors used to predict sectoral employment probabilities directly in our regressions, i.e., region dummies and education, gender and cohort fixed effects, as well as various forms of interactions of these fixed effects among each other and with country fixed effects, as we discuss in more detail in the next section.

3.5 Results

3.5.1 Life Satisfaction

Table 3.1 presents the results on our first main outcome variable, life satisfaction. To understand the size and direction of potential bias, we show a simple correlation in column (1) which suggests that without the correction for endogeneity, we would significantly underestimate the effect of disruption. In columns (2)-(5), we apply the instrumental variable strategy described above, gradually adding fixed effects to account for unobserved heterogeneity. In column (3), we include fixed effects for interactions of gender, birth cohort, and education groups; in column (4), we further restrict the model, allowing the comparison only within the same country; in column (5), we add region fixed effects. This does not significantly affect the size of the coefficient. However, the estimate loses its precision once we control for region fixed effects. Nevertheless, we set this very demanding specification from column (5) as our baseline to ensure that we account for all potential confounders, and that our estimates can be interpreted causally.

Table 3.1: The effect of disruption on life satisfaction

	Life satisfaction				
	(1) OLS	(2) 2SLS	(3) 2SLS	(4) 2SLS	(5) 2SLS
Disruption probability	-1.514***	-7.531***	-6.597***	-5.485***	-6.560*
	(0.141)	(0.437)	(0.423)	(1.693)	(3.535)
Demographics FEs			✓		
Demographics-Country FEs				✓	✓
Region FEs					✓
First stage coefficient		0.502***	0.500***	0.240***	0.242***
		(0.014)	(0.015)	(0.040)	(0.051)
Kleibergen-Paap F		1201.486	1128.739	35.486	22.887
N	25,902	24,854	24,854	24,853	24,853

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of OLS (column (1)) and 2SLS (columns (2)-(5)) analyses. Column (3) includes interacted gender, birth cohort, and education FEs, column (4) interacts gender, birth cohort, education FEs with country FEs, column (5) adds region FEs. The endogenous variable of interest is the probability of disruption calculated according to the rule (1). Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

The first stage coefficient is highly significant and has an expected sign. Its magnitude decreases by half when we use the variation across demographic cells only within the same

country. However, further inclusion of region fixed effects does not significantly affect either the point estimate or its significance. The Kleibergen-Paap F-statistic predictably drops from column (2) to column (5); however, it is still sufficiently high for the instrument to be considered valid.

The results are in line with our graphical evidence (Figure 3.1), and suggest that there are long-lasting effects of experiencing disruption during the transition on contemporary life satisfaction. Using a binary variable capturing personal unemployment status instead of the probability of disruption also leads to negative coefficients, which are, however, of a lower magnitude (Table 3.3, Appendix 3.A). This suggests that the adverse impact of transition goes beyond the personal experience of losing a job and works through affecting the community around the individual too. Moreover, as Table 3.4 in Appendix 3.A indicates, we capture the negative effect specific to the transition period and not only any effect of a job loss. To show this, we recalculate our main variable of interest, the probability of disruption, and instrument based on shares of respondents who lost their pre-transition jobs during the ten years after the transition period, which we defined in this paper as 1989-1995. Columns (2)-(4) present insignificant coefficients for both 1996-2000 and 2001-2005 as well as for these two periods together.

3.5.2 Robustness Checks

In Tables 3.5 - 3.7 in Appendix 3.A, we report a number of robustness checks. To ease the comparison, the first columns of these tables present the baseline estimates from the most conservative model in column (6) of Table 3.1.

As described in Section 3.4, having too few observations per industry - region or industry - demographic group cell could bias the probabilities $\gamma_{isc,-i}$ estimated with the multinomial logit and, therefore, our instrument as a whole. In our baseline specification, we drop only those respondents who are alone in their cells. In this robustness check, we investigate how the first stage changes if we use the full sample or drop respondents in cells with 2 and more observations. As Table 3.5 in Appendix 3.A shows, using the full sample or dropping the larger number of respondents has almost no effect on either the first stage point estimate or its significance.

In Table 3.6, we run our baseline specification, dropping all respondents from a particular country to check whether our main result on satisfaction is driven by that country. As columns (2)-(12) show, the estimates are mostly robust: the sign of coefficients re-

mains negative, and only dropping Estonia, Poland, and Romania makes the coefficients less precise.

We also conduct a number of additional robustness checks and present the results in Table 3.7. In column (2), we include occupation (ISCO 4-digit codes) by country fixed effects. This restricts us to estimating the effect of disruption on life satisfaction only out of variation across respondents who were employed in 1988 in the same occupation within the same country. The result is stable even when we apply this very demanding specification. In column (3), we add other potentially relevant controls including an indicator for living in a rural area in 1988, an indicator for having a serious illness or disability in 1988, and years of employment prior to the transition (by the end of 1988). Here, we also obtain a coefficient close to the baseline. In column (4), we check the robustness of our results to using only wave 7 values of life satisfaction instead of averaging them across all waves. The point estimate and standard errors are not statistically different from the baseline.

In addition, since the information on political orientation and some health outcomes was not collected in all waves, we re-estimate the effect of disruption on life satisfaction for the samples of respondents for whom this information is available. Table 3.8 in the Appendix 3.A presents the results of estimation. Even though the estimates are of lower magnitude and insignificant, the direction of the effects remains the same. Meanwhile, the imprecision could be due to the substantial cuts in the sample.

3.6 Mechanisms

3.6.1 Economic and Social Channels

Among the potential channels through which the transition disruption could still affect life satisfaction are economic and social well-being. As the results of the 2SLS analysis in Table 3.9 in Appendix 3.A suggest, respondents who experienced a disruption during the transition period tend to have lower household income, report difficulty in making ends meet more often, are more likely to have no children and to have never been married or to have ever been divorced. However, it should be noted that, in contrast to previous literature (Charles and Stephens 2004; Huttunen and Kellokumpu 2016; Charles and Stephens 2004), the only statistically significant effect here is on marital status. At the same time, there is an unexpected positive coefficient for household total assets, which is

significant at the 5% level. The result also holds when we divide household assets by the number of household members. One potential explanation for this may be that people who experienced a disruption may tend to save more to build up a safety net for the future.

In order to investigate whether any of these socio-economic outcomes present the mechanism behind the negative effect of transition disruption on life satisfaction, we add each of these outcomes to the baseline specification. The results are presented in the first five columns of Table 3.2. They suggest that the only outcome which mediates and reduces the effect of disruption on life satisfaction when added to the model is marital status.

3.6.2 Health Related and Psychological Channels

Another potential mechanism behind the adverse effects of the transition disruptions investigated in the paper is health and psychological factors. As in the previous subsection, we construct two tables: Table 3.10 in Appendix 3.A presents the estimates of the effects of disruption on health and psychological outcomes, and Table 3.2, columns (6)-(15) presents estimates of disruption effects on life satisfaction conditional on these outcomes. The results suggest that experiencing economic disruption during the transition period significantly increases alcohol and tobacco use, which is in line with previous literature (Eliason and Storrie 2009; Browning and Heinesen 2012; Currie, Duque, and Garfinkel 2015), while its long-term effects on other physical and mental health determinants are mild. There is also a psychological outcome, which is shifted by a transition disruption - perceived control, feeling that what happens to a person is outside of his or her own control. While some studies argue that the perceived control remains relatively stable over time (Cobb-Clark and Schurer 2013; Infurna et al. 2016), we document that it could vary around major life events such as job loss, and that the negative effect does not vanish after several years, as found by Preuss and Hennecke (2018).

Table 3.2: Socio-economic, health related and psychological outcomes as mechanism

	Life satisfaction														
	socio-economic outcomes					health related and psychological outcomes									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Disruption probability	-5.929*	-6.723*	-6.290*	-6.281*	-5.750	-4.962	-6.606*	-5.999*	-6.737*	-5.842*	-1.518	-2.296	-1.966	-6.273*	-4.259
	(3.524)	(3.555)	(3.490)	(3.508)	(3.497)	(3.221)	(3.592)	(3.540)	(3.535)	(3.146)	(2.054)	(2.317)	(2.717)	(3.471)	(3.158)
IHST of HH income	0.449***														
	(0.040)														
IHST of HH assets		0.024***													
		(0.005)													
Difficulty in MEM			-0.977***												
			(0.034)												
No children				-0.469***											
				(0.064)											
Never married/Ever divorced					-0.499***										
					(0.041)										
Self-perc. health (1 Excel. ... 5 Poor)						-0.742***									
						(0.016)									
Number of chronic diseases							-0.266***								
							(0.012)								
Number of doctor visits								-0.032***							
								(0.002)							
Hospital stay (Yes/No)									-0.403***						
									(0.029)						
Quality of life score (higher - better)										0.187***					
										(0.002)					
Depression scale (higher - worse)											-0.366***				
											(0.008)				
Ever smoked daily												-0.165***			
												(0.026)			
Drinking (1 not at all ... 7 alm. every day)													0.044***		
													(0.009)		
Overweight														0.107***	
														(0.026)	
Control over life															0.685***
															(0.017)
Region FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Demographics-Country FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Kleibergen-Paap F	22.642	22.838	22.964	22.504	22.421	22.806	22.348	22.563	22.884	22.714	64.857	64.228	57.552	24.060	22.820
N	24,853	24,853	24,790	23,929	24,845	24,852	24,798	24,812	24,853	24,658	14,301	14,363	11,511	24,695	24,823

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents 2SLS estimates of the effect of transition disruption on life satisfaction conditional on various socio-economic, health related and psychological outcomes. The endogenous variable of interest is the probability of disruption calculated according to the rule (1). Demographics-Country FEs are presented by the interaction of gender, birth cohort, education, and country FEs. Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

These three factors - smoking, drinking, and control over life could be another set of channels (in addition to social well-being from Subsection 3.6.1) through which an economic disruption during the transition could affect later life satisfaction. However, in the case of drinking and smoking, this is rather a suggestive evidence because, as indicated in Table 3.8, Appendix 3.A, there is not enough power to estimate the effect of disruption on life satisfaction in the restricted samples of respondents for whom the information on these health outcomes is available.

3.6.3 Heterogeneity of the Effect

As previous literature suggests (Shields and Price 2005; Kassenboehmer and Haisken-DeNew 2009; Luo 2020), the overall negative effects of unemployment on life satisfaction could be driven by individuals from particular groups, while for others, this effect is mild or even insignificant. To investigate this aspect, we estimate our baseline model for life satisfaction, interacting the disruption probability with the set of dummies for men and women with and without university degree. Column (1) of Table 3.11 in Appendix 3.A presents the results. It suggests that men without higher education are the most vulnerable group, which is still suffering adverse consequences of disruption during the transition period. In columns (2) and (3), we estimate the same specification for two other outcomes that might function as the mechanisms behind the negative effect of unemployment on life satisfaction - the probability of being single or divorced, and perceived life control. The results suggest that, in contrast to women, disrupted men are more likely to have either never been married, or to have experienced a divorce (thus currently not being married not widowed). At the same time, they more often feel that what happens to them is out of their control. Among men, the response to a transition disruption of the group of respondents without higher education tends to be stronger than the responses of better-educated respondents.

3.7 The Political Legacy of the Transition

In the previous section, we document long-lasting adverse impacts of a transition disruption on life satisfaction, which is likely to be channeled through non-economic factors. Here, we investigate whether these negative effects on various life outcomes could translate into effects on political attitudes. We apply our baseline IV specification to estimate

the influence of disruption on left-right self-placement, using two outcome measures: a continuous variable on a 11-point Likert scale, with higher values indicating a more right-wing orientation, and a binary indicator for respondents who are on the right side of this scale (choose a number between 6 and 10).

Table 3.3 presents the results. As in the case of life satisfaction, it shows a raw correlation in column (1) gradually adding fixed effects to the IV model with the continuous dependent variable in columns (2)-(5). In column (6), we re-estimate the baseline specification with the dummified outcome. First, the results indicate that using a simple OLS model would significantly bias the coefficient estimate. Second, they suggest that individuals who were more exposed to disruptions during the transition period tend to express more right-wing attitudes.

Table 3.3: The effect of disruption on left-right political orientation

	Left...Right					Right
	(1) OLS	(2) 2SLS	(3) 2SLS	(4) 2SLS	(5) 2SLS	(6) 2SLS
Disruption probability	0.856***	3.601***	4.226***	3.577***	7.321*	2.012**
	(0.234)	(0.577)	(0.611)	(1.223)	(3.994)	(0.866)
Demographics FEs			✓			
Demographics-Country FEs				✓	✓	✓
Region FEs					✓	✓
First stage coefficient	0.501***	0.557***	0.552***	0.434***	0.429***	0.429***
	(0.015)	(0.015)	(0.015)	(0.033)	(0.059)	(0.059)
Kleibergen-Paap F		1373.386	1325.561	176.965	52.868	52.868
N	12,698	12,298	12,296	12,289	12,289	12,289

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of OLS (column (1)) and 2SLS (columns (2)-(6)) analyses. Column (3) includes interacted gender, birth cohort, and education FEs, column (4) interacts gender, birth cohort, and education FEs with country FEs, column (5) adds region FEs. The dependent variable in columns (1)-(6) is a continuous measure of political orientation on the left (0) ... right (10) scale; the dependent variable in column (7) is a binary indicator for respondents on the right (from 6 to 10) side of this scale. The endogenous variable of interest is the probability of disruption calculated according to the rule (1). Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

3.8 Conclusion

This paper studies the long-run effects of personal experience of work-life disruption during the transition period on life satisfaction and political left-right orientation in the

11 former communist CEE countries. Our core independent variable of interest is the share of persons in the local industry sector of a given respondent whose work history was disrupted during the transition years of 1989-1995. Using this share instead of personal unemployment status allows us to capture a wider range of effects triggered not only by a respondent's own job loss, but also by the experience of seeing colleagues losing their job, of fearing the loss of one's own job for years, or of management changes and downsizing at one's employment site. To identify causal relationships, we implement an instrumental variable strategy. We construct an instrument which presents the potential exposure of a person to a country-wide sector-specific transition disruption shock.

We find a significant negative impact of transition disruptions on current life satisfaction, which is stronger for men without university degree. We also identify a number of negative long-run effects on marital status, control over life, and some health outcomes (likelihood of drinking and smoking), which potentially present the mechanisms behind the effect on life satisfaction. Furthermore, we document that a career disruption during the transition period shifts political orientation towards the right side of the left-right scale.

Our analysis adds to the ongoing debate over the causes of the recent rise of populist sentiment and especially far-right parties. It also has clear policy implications. The results obtained in this paper suggest that, during a crisis and in its aftermath, policy makers should supplement anti-crisis economic measures with social and psychological support.

3.A Appendix: Supplemental Tables

Table 3.1: Availability of questions by country and wave

	Life satisfaction (Left/right in bold)						Life history	
	W2 2006/07	W3 2008/09	W4 2010/11	W5 2012/13	W6 2014/15	W7 2017/18	W3 2008/09	W7 2017/18
Bulgaria						+		+
Croatia					+	+		+
Czechia	**+**		**+**	**+**	+	+	+	+
Estonia			**+**	**+**	+	+		+
Hungary			**+**			+		+
Latvia						+		+
Lithuania						+		+
Poland	**+**		+		+	+	+	+
Romania						+		+
Slovakia						+		+
Slovenia			**+**	**+**	+	+		+

Note: The plus sign indicates in which country and wave the question about life satisfaction was asked and life histories were collected. If the sign is in bold, then in this country and wave, the survey also included the question about political left-right orientation.

Table 3.2: Summary statistics

	Mean	SD	Min	Max	N
Women	0.552	0.497	0	1	25,008
Birth cohort:					
Before 1935	0.042	0.202	0	1	25,008
1935-1944	0.228	0.419	0	1	25,008
1945-1954	0.391	0.488	0	1	25,008
1955-1964	0.309	0.462	0	1	25,008
After 1964	0.030	0.170	0	1	25,008
Education:					
None or primary education	0.065	0.247	0	1	25,008
Lower secondary education	0.185	0.388	0	1	25,008
Upper secondary education	0.503	0.500	0	1	25,008
Post-secondary non-tertiary education	0.070	0.256	0	1	25,008
Tertiary education	0.177	0.381	0	1	25,008
Industry:					
Agriculture	0.173	0.378	0	1	25,008
Mining	0.022	0.146	0	1	25,008
Manufacturing	0.265	0.441	0	1	25,008
Utilities	0.022	0.146	0	1	25,008
Construction	0.074	0.261	0	1	25,008
Trade	0.076	0.265	0	1	25,008
Hotels and restaurants	0.023	0.151	0	1	25,008
Transport	0.069	0.254	0	1	25,008
Financial intermediation	0.007	0.085	0	1	25,008
Real estate	0.001	0.030	0	1	25,008
Public administration	0.052	0.222	0	1	25,008
Education	0.080	0.272	0	1	25,008
Health	0.054	0.225	0	1	25,008
Other	0.082	0.274	0	1	25,008
Disrupted	0.123	0.328	0	1	25,008
Disruption probability	0.122	0.101	0	1	25,008
Exposure	0.152	0.080	0	1	25,008
Life satisfaction	7.132	1.815	0	10	24,854
Left...Right attitudes	5.020	2.263	0	10	12,298
Control over life (higher - more)	2.840	0.881	1	4	24,867
IHST of HH income	9.783	0.759	0	13	25,008
IHST of HH assets	6.190	5.679	0	17	25,008
Difficulty in MEM (No/Yes)	0.442	0.497	0	1	24,936
No children	0.035	0.184	0	1	24,083
Never married/Ever divorced	0.127	0.334	0	1	25,000
Self-perc. health (1 Excel. ... 5 Poor)	3.417	0.918	1	5	24,999
Number of chronic diseases	1.212	1.138	0	9	24,945
Number of doctor visits	5.850	6.725	0	98	24,959
Hospital stay (No/Yes)	0.257	0.437	0	1	25,001
Quality of life score (higher - better)	35.934	5.896	12	48	24,691
Depression scale (higher - worse)	2.496	1.935	0	12	14,309
Ever smoked daily	0.463	0.499	0	1	14,414
Drinking (1 not at all ... 7 alm. every day)	2.735	1.712	1	7	11,534
Overweight	0.659	0.474	0	1	24,832

Table 3.3: The effect of disruption (personal unemployment) on life satisfaction

	Life satisfaction				
	(1) OLS	(2) 2SLS	(3) 2SLS	(4) 2SLS	(5) 2SLS
Disrupted	-0.356***	-6.838***	-5.761***	-5.234***	-3.584*
	(0.038)	(0.625)	(0.506)	(2.013)	(2.088)
Demographics FEs			✓		
Demographics-Country FEs				✓	✓
Region FEs					✓
First stage coefficient		0.553***	0.572***	0.251***	0.443***
		(0.040)	(0.038)	(0.076)	(0.156)
Kleibergen-Paap F		192.636	230.166	10.953	8.020
N	26,022	24,854	24,854	24,853	24,853

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of OLS (column (1)) and 2SLS (columns (2)-(5)) analyses. Column (3) includes interacted gender, birth cohort, and education FEs, column (4) interacts gender, birth cohort, and education FEs with country FEs, column (5) adds region FEs. The endogenous variable of interest is the dummy indicating respondents who experienced a disruption during the transition period. Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

Table 3.4: The effects of disruption on life satisfaction: Different periods of disruption

	Life satisfaction			
	(1) 1989-1995	(2) 1996-2000	(3) 2001-2005	(4) 1996-2005
Disruption probability	-6.560*	-3.308	1.030	-2.406
	(3.535)	(4.211)	(4.211)	(4.881)
Region FEs	✓	✓	✓	✓
Demographics-Country FEs	✓	✓	✓	✓
Kleibergen-Paap F	22.887	67.241	63.516	26.432
N	24,853	24,853	24,853	24,853

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table present 2SLS estimates of the effect of disruption experienced in different periods on life satisfaction. The transition period studied in the paper is in column (1). The endogenous dependent variable is the probability of disruption calculated according to the rule (1). Demographics-Country FEs are presented by the interaction of gender, birth cohort, education, and country FEs. Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

Table 3.5: Robustness check: Dropping small cells

	Disruption probability							
	(1) Baseline	(2)	(3)	(4)	(5)	(6)	(7)	(8) Full sample
Cell size	$\geqslant 2$	$\geqslant 3$	$\geqslant 4$	$\geqslant 5$	$\geqslant 6$	$\geqslant 7$	$\geqslant 8$	$\geqslant 1$
Exposure	0.242***	0.249***	0.215***	0.163***	0.185***	0.143***	0.171***	0.244***
	(0.051)	(0.048)	(0.047)	(0.046)	(0.041)	(0.040)	(0.039)	(0.053)
Region FEs	✓	✓	✓	✓	✓	✓	✓	✓
Demographics-Country FEs	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.326	0.365	0.389	0.415	0.447	0.474	0.505	0.303
Kleibergen-Paap F	22.887	26.548	21.201	12.577	19.942	12.634	19.144	21.638
N	24,853	23,495	22,155	20,845	19,294	17,852	16,709	25,870

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the first stage results for the full sample (column (8) and samples without respondents in small cells (columns (1)-(7)). The cell size is defined by the number of respondents in industry-region or industry-country-gender-birth cohort-education group. The endogenous dependent variable is the probability of disruption calculated according to the rule (1). Demographics-Country FEs are presented by the interaction of gender, birth cohort, education, and country FEs. Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

Table 3.6: Robustness check: Dropping countries

	Life satisfaction											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Baseline	No Bulgaria	No Croatia	No Czechia	No Estonia	No Hungary	No Latvia	No Lithuania	No Poland	No Romania	No Slovakia	No Slovenia
Disruption probability	-6.560*	-5.071*	-6.986*	-6.001*	-25.038	-6.793*	-7.457**	-5.407*	-4.861	-6.642	-6.863**	-6.214*
	(3.535)	(2.826)	(3.712)	(3.367)	(25.176)	(3.593)	(3.585)	(2.920)	(3.131)	(6.832)	(3.269)	(3.444)
Region FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Demographics-Country FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Kleibergen-Paap F	22.887	34.324	21.097	24.517	1.329	22.381	23.815	32.533	27.598	5.958	27.369	23.770
N	24,853	23,291	23,362	21,102	20,697	23,661	23,553	23,226	20,946	23,429	23,123	22,140

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of a 2SLS analysis, where column (1) contains baseline estimates, and columns (2)-(12) - estimates for the samples without respondents from a particular country. The endogenous variable of interest is the probability of disruption calculated according to the rule (1). Demographics-Country FEs are presented by the interaction of gender, birth cohort, education, and country FEs. Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

Table 3.7: Additional robustness checks

	Life satisfaction			
	(1) Baseline	(2) Job-Country FEs	(3) Additional controls	(4) Only wave 7
Disruption probability	-6.560*	-9.129*	-7.853**	-6.766*
	(3.535)	(4.830)	(3.555)	(3.730)
Additional controls			✓	
Region FEs	✓	✓	✓	✓
Demographics-Country FEs	✓	✓	✓	✓
Job-Country FEs		✓		
Kleibergen-Paap F	22.887	14.278	23.696	23.169
N	24,853	24,729	23,320	23,488

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents the results of a 2SLS analysis with several modifications of the baseline specification in column (1): column (2) - occupation-country fixed effects are added; column (3) - additional controls (indicators for living in a rural area and having a serious illness or disability in 1988, years of employment by 1988) are added; column (4) - only wave 7 values are used instead of averages across all waves. Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

Table 3.8: The effect of disruption on life satisfaction for restricted samples

	Life satisfaction			
	(1) Left/right sample	(2) Depression sample	(3) Ever smoked sample	(4) Drinking sample
Disruption probability	-1.797	-2.666	-2.570	-1.670
	(2.712)	(2.333)	(2.314)	(2.717)
Region FEs	✓	✓	✓	✓
Demographics-Country FEs	✓	✓	✓	✓
Kleibergen-Paap F	52.644	65.330	64.242	57.753
N	12,288	14,301	14,363	11,511

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table present 2SLS estimates of the effect of disruption on life satisfaction for the restricted samples of respondents for whom the following information is available: left-right political orientation - column (1); depression score - column (2), smoking and drinking behavior - columns (3) and (4) respectively. The endogenous dependent variable is the probability of disruption calculated according to the rule (1). Demographics-Country FEs are presented by the interaction of gender, birth cohort, education, and country FEs. Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

Table 3.9: The effect of disruption on economic and social outcomes

	(1) IHST of HH income	(2) IHST of HH assets	(3) Difficulty in MEM	(4) No children	(5) Never married/Ever divorced
Disruption probability	-1.404	7.763**	0.301	-0.017	1.592**
	(1.079)	(3.591)	(1.376)	(0.321)	(0.742)
Region FEs	✓	✓	✓	✓	✓
Demographics-Country FEs	✓	✓	✓	✓	✓
Kleibergen-Paap F	23.392	23.392	23.819	22.822	23.141
N	25,007	25,007	24,935	24,077	24,999

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents 2SLS estimates of the effect of transition disruption on various socio-economic outcomes. The endogenous variable of interest is the probability of disruption calculated according to the rule (1). Demographics-Country FEs are presented by the interaction of gender, birth cohort, education, and country FEs. Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

Table 3.10: The effect of disruption on health related and psychological outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Self-perc. health (1 Excel. ... 5 Poor)	Number of chronic diseases	Number of doctor visits	Hospital stay (Yes/No)	Quality of life score (higher - better)	Depression scale (higher - worse)	Ever smoked daily	Drinking (1 not at all ... 7 alm. every day)	Overweight	Control over life (higher - more)
Disruption probability	2.110	0.896	17.723	-0.368	-6.797	2.862	1.597**	6.642***	0.768	-3.674**
	(1.610)	(1.989)	(11.665)	(0.711)	(9.149)	(2.483)	(0.702)	(2.215)	(1.004)	(1.798)
Region FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Demographics-Country FEs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Kleibergen-Paap F	23.468	23.099	23.189	23.769	23.220	65.503	65.914	59.282	24.626	22.859
N	24,998	24,944	24,958	25,000	24,689	14,305	14,410	11,528	24,832	24,866

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents 2SLS estimates of the effect of transition disruption on various health related and psychological outcomes. The endogenous variable of interest is the probability of disruption calculated according to the rule (1). Demographics-Country FEs are presented by the interaction of gender, birth cohort, education, and country FEs. Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

Table 3.11: Heterogeneity of the effect of disruption on life satisfaction

	(1) Life satisfaction	(2) Never married/ Ever divorced	(3) Control over life
Men without degree × Disruption probability	-8.374**	2.572***	-3.879**
	(3.875)	(0.939)	(1.925)
Men with degree × Disruption probability	-4.070	1.263*	-2.821*
	(3.350)	(0.760)	(1.703)
Women without degree × Disruption probability	-5.422	0.897	-3.934
	(5.388)	(1.155)	(2.831)
Women with degree × Disruption probability	-7.048	-2.178	-4.902
	(6.798)	(1.868)	(3.325)
Region FEs	✓	✓	✓
Demographics-Country FEs	✓	✓	✓
Kleibergen-Paap F	2.821	2.899	2.890
N	24,853	24,999	24,866

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The table presents 2SLS estimates of the effect of transition disruption on life satisfaction (column (1)), marital status (column (2)), and perceived control (column (3)) for different demographic groups: men and women with and without university degree. The endogenous variable of interest is the probability of disruption calculated according to the rule (1) and interacted with the dummies for demographic groups. Demographics-Country FEs are presented by the interaction of gender, birth cohort, education, and country FEs. Standard errors in parentheses are clustered by region - gender - birth cohort - education group.

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