

MARKET UNDER THE RADAR: SOVIET SHADOW ECONOMY AND POST-SOVIET PREFERENCES IN GEORGIA

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We study the long-run effect of the Soviet shadow economy on attitudes toward the market economy and competition in Georgia – a former Soviet republic known for the high prevalence of the shadow economy. We use the density of Soviet-era organized crime as a proxy for the local prevalence of shadow economy and instrument it with agroclimatic suitability for citrus fruits, exploiting the fact that citrus and other subtropical agricultural products were an object of shortage and illicit trade during the Soviet era. We show that the citrus-suitable parts of Georgia have a higher density of Soviet-era thieves in law and that survey respondents living in these areas are more likely to report lower preference towards state ownership of businesses and higher appreciation of competition. Higher social legitimacy of private entrepreneurship is likely to be behind these findings: employed respondents in citrus-producing areas rate fairness of their compensation higher than in the rest of Georgia when they have their own business and lower – when they work in the public sector.

Key words: shadow economy, historical legacies, communism, Republic of Georgia.

1 Introduction

This paper deals with the impact of the Soviet-era shadow economy on modern-day attitudes toward the market and competition in Georgia. Despite the existence of rich literature examining the effect of communism on values, beliefs, and preferences of people living in post-Communist societies, the Communist-era shadow economy remains a promising but understudied topic. Even less is known about its long-term consequences. Studying the effect of various aspects of “living through Communism” (Pop-Eleches and Tucker, 2017) on values, beliefs, and preferences is critical for understanding the phenomenon of *nostalgia* which might impede democratization (Gotfredsen, 2014; Kasamara and Sorokina, 2012; Mohr and Brown, 2021; White, 2010). More generally, it also helps us to understand the role of path dependence in shaping current values and attitudes (Alesina, Giuliano and Nunn, 2013; Becker et al., 2016; Galor and Özak, 2016; Nunn and Wantchekon, 2011).

In the Soviet Union, private entrepreneurship was forbidden. However, the so-called "second economy" – shadow private businesses selling otherwise legitimate products, played a significant role in the everyday lives of the Soviet citizens. Shortages of goods were a common characteristic of life in the Soviet Union and in other centrally planned economies (Kornai, 1980). However, shadow entrepreneurs played a crucial role in overcoming these shortages and supplying the population with desirable products like fruits, flowers, clothes, footwear, and even car parts. This phenomenon was widespread in the republics of the South Caucasus: Armenia, Azerbaijan, and Georgia (Clark, 1993; Feldbrugge, 1984; Scott, 2017). According to some estimates, over 25 percent of the Georgian SSR's GNP was produced in the "second economy" (Mars and Altman, 1983). As we will argue, these regions' suitability for sub-tropical agriculture predetermined this phenomenon, at least to some extent. This makes Georgia a particularly attractive setting to investigate the long-term consequences of the shadow economy.

Another reason to focus on Georgia is the country's spectacular institutional transformation during the 2000s. Following the 2003 Rose Revolution, Georgia transformed from a borderline failed state rife with corruption, organized crime, and poverty into one of the best performers among the post-Soviet countries in terms of democracy, economic freedom, and anti-corruption (Kukhianidze, 2009; Kupatadze, 2012; 2017; Slade, 2012). Our study digs deeper into the historical origins of Georgian institutions and political preferences.

In our analysis, we examine how spatial variation in the prevalence of the shadow economy within Georgia affected present-day views on the market economy and competition. In particular, we are concerned with the Georgians' opinion on whether private or public ownership of businesses should be increased and whether competition is good or harmful for society. We focus on these two dependent variables since the lack of private entrepreneurship and limited competition due to goods and services shortages and central planning quotas constituted crucial defining features of the Soviet economic system.

We use survey data to measure our dependent variables and rely on geocoded biographical data of Soviet-era career criminals who provided security for shadow businesses (so-called "thieves-in-law") in order to develop a proxy for the local prevalence of the shadow economy. Since our shadow economy is likely endogenous, we use the two-stage least squares (2SLS) regression. Under this approach, we instrument the prevalence of shadow economy with agro-

climatic suitability for citrus crops – a sought-after agricultural product heavily cultivated in some regions of Western Georgia.

An advantage of such an empirical design is that we hold constant aspects of the Soviet regime as propaganda and restrictions on civil and political freedom, focusing only on variation in *de facto* economic freedom. This allows us to isolate a particular channel through which the Soviet regime affected public preferences. If the communist regimes affected public preferences in the long run through lesser exposure to the markets, we would expect to see stronger support for the market in the areas which, due to idiosyncratic reasons, had a higher prevalence of the shadow market economy. In the following sections, we detail potential mechanisms behind this expected relationship and falsification tests to present our relationship as causal.

Our paper proceeds as follows. Section 2 introduces the background and the conceptual framework. Section 3 describes our data and models. Section 3 reports the baseline results. Section 4 considers several placebo tests to underpin the validity of our empirical analysis. Section 5 proposes a probable mechanism. Section 6 concludes.

2 Background and Conceptual Framework

Thirty years after the collapse of communism, preferences, values, behavior, and perceptions of residents of former communist countries still differ from their counterparts in countries that did not experience communist rule in many dimensions, generally reflecting the differences in policies pursued by the Communist governments versus the democratic Western governments. Residents of the former Communist countries have stronger support for government involvement in the economy and redistribution of income, lower subjective value of democracy and environment, though not necessarily higher support for gender equality, contrary to what could be expected from the Communist gender policies (Alesina and Fuchs-Schündeln, 2007; Chaisty and Whitefield, 2015; Fuchs-Schündeln and Schündeln, 2020; Libman and Obydenkova 2021; Pop-Eleches and Tucker, 2017).

Communism and its legacies could affect current political attitudes in several ways, and it is crucial to disentangle them. The Communist regimes shared numerous defining features, such as centrally planned state-owned economies which outlawed or tightly restricted private entrepreneurship, lack of representative government and political freedoms, pervasive propaganda,

political repression, and domestic spying. Nevertheless, they were by no means a homogeneous phenomenon. Some studies, like Pop-Eleches and Tucker (2017), distinguish between hardline communism (e.g., Stalinism) vs. reformed communism. However, such broad characterizations denote wide variations in regime type across numerous policy domains, making it hard to disentangle specific channels through which Communist policies and experiences affected current outcomes.

Another approach exploits within-country variation in the exposure to particular aspects of the Communist rule to estimate their long-term effects, also focusing on subnational outcomes (Lankina, Libman and Obydenkova, 2016ab; Libman and Obydenkova 2015; Obydenkova 2012). Though official policies were uniform across the country, informal practices and the intensity of policy enforcement often varied at the subnational level.

Idiosyncratic local variation in the intensity of political persecution, either in the form of arrests, domestic spying, or the location of detention facilities, has been frequently used to identify the long-term consequences of repression. Kapelko and Markevich (2014) demonstrated that the presence of a Gulag camp in a locality is associated with stronger anti-Communist voting in Russia. Similarly, within Ukraine, Stalinist deportations contributed to lower support for the pro-Russian parties (Rozenas, Schutte and Zhukov, 2017); the 1932-1924 "terror by hunger" led to lower lower dissidence during the Soviet regime's heyday, but a more significant opposition when its power and, consequently, a credible threat of retribution diminished (Rozenas and Zhukov, 2019). Nikolova, Popova, and Otrachshenko (2022) show that people in the former Soviet Union living closer to the former Gulag camps locations are less likely to trust others, vote, or join political parties. Similarly, higher government surveillance density in the former GDR led to lower interpersonal and institutional trust, lower income, and higher unemployment (Lichter, Löffler, and Siegloch, 2021).

The intensity of Communist socialization is another dimension that has been analyzed in this vein. Several papers show that the prevalence of the Communist Party membership at the regional level in Russia is associated with higher corruption (Libman and Obydenkova, 2013; Obydenkova and Libman, 2015), weaker regional democracy (Lankina, Libman, and Obydenkova, 2016a; Libman and Obydenkova, 2015), stronger anti-immigration attitudes (Libman and Obydenkova, 2020), and also with lower inequality (Libman and Obydenkova, 2019).

Relatively little is known about the legacy of resistance and survival practices under communism, with most research dealing with pre-communist variables like literacy levels, which are argued to attenuate the effect of Communist socialization due to the transmission of pre-Communist values and attitudes as well as the persistence of the local social structure (Darden and Grzymala-Busse, 2006; Lankina and Libman, 2021; Lankina, Libman, and Obydenkova 2016a). The legitimacy of the Communist regimes and previous experience of liberal institutions also mattered for the opposition to communism: for example, parts of the German Democratic Republic liberated and initially controlled by the Allies rather than the Soviet Union had higher levels of resistance to the East German regime in 1946-1953 (Martinez, Jessen, and Xu, 2023).

More generally, “emotional tagging” through different experiences under communism has been argued to affect post-communist beliefs and behaviors. In former East Germany, people living in “showcase cities” or in the same municipalities as Olympic champions heavily featured in the government propaganda demonstrate lower stock market participation, consistently with the negative view of financial markets in the Communist doctrine. The effect is reversed for the people who experienced failures of the Communist system, such as environmental pollution and lack of freedom of religion and information (Laudenbach, Malmeidner, and Niessen-Ruenzi, 2020).

The Soviet-era shadow economy could affect present-day preferences through two basic channels in our framework. First, it could improve the market-related skills of residents and increase the resources available to them. This would make it easier for them to adapt to the post-socialist transition and, therefore, support the new economic system. Second, the shadow economy could increase the social legitimacy of the market due to showcasing the inefficiencies of central planning and state ownership and the advantages of market economy and private initiative. In such a case, even those who have not benefited directly from the shadow economy would be more likely to support the market.

If the former explanation is true, we would see significantly higher levels of entrepreneurship and self-employment in the areas with a higher prevalence of shadow economy. However, this explanation does not seem likely since, as we will argue, the role of Soviet-era shadow businesses significantly decreased after the transition due to them losing their privileged position within the closed Soviet market. Under the latter explanation, however, we might observe increased support for the market economy even under the same socioeconomic conditions.

3 Data and Models

We use several data sources in our analysis. We obtain information on attitudes towards the market from the Caucasus Barometer, hereafter the CB. This survey has been carried out annually since 2008 by the Caucasus Research Resource Center (CRRC) in Armenia, Azerbaijan (until 2013), and Georgia. All the survey documentation and datasets are publicly available on the CRRC website. Sampled households were selected via random walk with primary sampling units (PSUs), which coincided with electoral precincts, and were sampled with probability proportional to the number of registered voters.

Relying on the CB allows us to have large samples with a good geographic representation of Georgia. The sample includes almost all the Georgian municipalities (second-order administrative-territorial units equivalent to the US counties) outside Abkhazia and South Ossetia. We geocode each PSU using lists of electoral precincts from the 2008 and 2013 Georgian presidential elections downloaded from the website of the Electoral Administration of Georgia.

We use survey data from the CB to elicit attitudes towards two crucial aspects of the market *de jure* absent or heavily restricted in the Soviet economic system: private ownership of enterprises and competition. We consider two survey questions as our dependent variables. The first question measures attitudes towards private vs. government ownership of businesses. The respondents were asked to rate their agreement with the statements: "*Private ownership of business should be increased*" and "*Government ownership of business should be increased*," with 1 standing for complete agreement with the first statement and 10 – with the second one. Another question measures attitudes toward competition. It uses the same scale, with lower values for a respondent believing that competition is good and higher values – that competition is harmful. The former variable is present only in 2011, 2012, and 2013 waves of the CB, the latter – in the 2011 and 2012 waves. Therefore, we include these three waves in our dataset.

Data on the share of the shadow economy are mostly estimates that are not available at a sufficiently disaggregated level. As a proxy for the local density of shadow entrepreneurship, we use the number of thieves-in-law who lived or were born in a particular area and were active during the Soviet era.

Thieves-in-law have been an exclusively male elite group of criminals in the Soviet Union and its successor states. It originated in the 1920s-1930s and was based on its member status recognition by fellow thieves and bound by a strict code of behavior forbidding any cooperation with the state (Galeotti, 2018, Lonsky, 2020)¹. Since Soviet shadow entrepreneurs could not rely on law enforcement and the judiciary to defend their interests, regions with a high prevalence of shadow economy offered a lucrative market for "protection services" by the mafia. In a similar framework, Dimico, Isopi and Olsson (2017) demonstrate that citrus plantations mattered for the rise of the Sicilian mafia due to planters' demand for protection in a weak law enforcement environment. However, our argument differs from theirs regarding the role we attach to the informal sector in the centrally planned economy. In the Soviet system, state-owned enterprises could not create a demand for private protection services, and the high density of mafia signaled shadow economy prevalence. Moreover, thieves-in-law strict code of behavior forbade any interaction with the state and its institutions.

Data on thieves-in-law comes from a biography database provided by the Prime Crime News Agency. Prime Crime is a Russian-language news site created in 2006 by Moscow-based businesspersons Alexander Ampilogov and Alla Gefter and currently edited by Victoria Gefter. It describes itself as "A museum of the thieves' world" and is unique for dealing exclusively with the history and current activities of the mafia in the post-Soviet countries. The validity of the Prime Crime database is supported by the fact that it is followed by criminals, who frequently leave their comments in the comments sections of its articles, and also by law enforcement officers (Chizh and Zakharov, 2021). Lonsky (2020) and Varese, Lonsky, and Podvysotskiy (2021) demonstrate that databases and statistics provided by Georgian and Russian law enforcement agencies match those obtained from the relevant fragments of the Prime Crime database.

The Prime Crime data on Georgian thieves are available at the level of municipalities. We collected the number of thieves-in-law who were residents or natives of 64 municipalities,

¹ Thieves-in-law influence of Georgia also persisted after the independence, peaking in the 1990s – early 2000s. However, it has also been severely reduced since the mid-2000s, when the reformist government of President Saakashvili initiated a successful crackdown on organized crime and corruption, imprisoning or driving into exile most thieves-in-law (Kukhianidze, 2009, Slade, 2012).

excluding those in Abkhazia and South Ossetia, and treated Tbilisi's whole capital city as a single municipality. Our primary purpose is to identify the density of thieves-in-law who were active during the Soviet era. Since individual profiles in the original database are sometimes incomplete, we used several criteria to identify relevant individuals. We included only those thieves-in-law who were born no later than in 1971, so they were at least 20 at the moment of the Soviet Union breakup. If the year of birth was missing, we included those thieves who had their status recognized by the criminal community (a thief was "crowned") or revoked ("deposed") no later than 1991. If all the dates mentioned above were missing, we used additional information like a thief's profile featuring an old black-and-white or sepia photo. Then we normalized the number of thieves-in-law in a municipality by its population in 1989 and took log of the resulting ratio. We mainly use the number of thieves-in-law who lived in a municipality in our estimations but also resort to the number of those locally born as a robustness check.

The prevalence of shadow entrepreneurship is arguably an endogenous variable, which could be affected by the strength of communist beliefs among residents. People who initially had weaker Communist beliefs might have been more enthusiastic about participating in shadow economic activities and less likely to collaborate with the authorities in their suppression. It does not seem possible to find a reliable indicator of the communist beliefs' strength in Soviet Georgia at the local level. Also, measurement error due to the nature of the thieves-in-law proxy is likely to introduce bias since people exposed to organized crime might associate the shadow economy with illicit wealth accumulation, corruption, and violence, eventually rejecting markets altogether.

We resort to the instrumental variable strategy. We instrument the thieves-in-law variable with agroclimatic suitability for growing citrus. West Georgia used to be among the leading areas of subtropical agriculture in the Soviet Union. In the 1980s, Georgia produced more than a third of citrus fruits consumed in the Soviet Union (Bedoshvili et al., 2009, 4). Citrus fruits were in short supply in the Soviet planned economy. Their high value made them suitable for smuggling to Russia and other republics lacking subtropical agriculture, where they were sold through informal channels.

Our instrument is agroclimatic suitability for growing citrus fruits. We collected this data from FAO Global Agro-Ecological Zones (GAEZ). This database includes estimates of agroclimatically possible yield for a selection of crops, including citrus, across five arc-minute grid

cells. Since agro-climatic potential yield has not been calculated for most of the Georgian territory due to its unsuitability for growing citrus, we concentrated on the extensive margin and coded a dummy variable taking, for each PSU, a value of 1 if a PSU is located in the area suitable for growing citrus and 0 otherwise. Then, for each municipality available in the CB dataset, we calculated the fraction of respondents living in the citrus-suitable PSUs and used this variable as an instrument for the municipality-level thieves-in-law density.

Conveniently for our identification strategy, the citrus economy is much less significant for Georgia today than it was during the Soviet era. After the breakup of the Soviet Union, the role of citrus and other subtropical crops for Georgian agriculture decreased dramatically due to tensions in the Russo-Georgian relations and increased competition from third countries producers who benefited from liberalized access to the post-Soviet markets. According to Bedoshvili et al. (2009, 4), "farmers of West Georgia suffered even more than other parts of Georgia. Production of tea and citrus declined drastically (at least as much as tenfold). This decline was more remarkable than that of the production of temperate seed fruits and grape in East Georgia. Almost 90% of the tea plantations are still abandoned; most of the citrus plantations are managed at a very low input level and only best fruits are harvested." This makes less likely a direct impact of citrus suitability on popular preferences through better development outcomes, making our case for path-dependence in the Georgian pro-market orientations stronger.

We show that respondents living in Georgian municipalities suitable and non-suitable for citrus growing are similar in terms of several observable characteristics, both contemporary and pre-1917. However, even if the Soviet-era prevalence of the shadow economy did not translate into better post-transition development outcomes, it still resulted in higher support for the market economy.

We formulate our hypotheses as follows:

H1: Areas with a higher prevalence of Soviet-era shadow economy have higher support for the market.

Our baseline empirical specification is as follows:

$$Thieves\ in\ Law_j = \delta Citrus_j + \theta X_{ij} + e_{ij} \quad (1.1)$$

$$Pro - Market Attitudes_{ij} = \alpha + \beta Thieves in Law_j + \gamma X_{ij} + e_{ij} \quad (1.2)$$

where i indicates an individual,

j – a municipality,

$$Thieves in Law_j = \ln\left(\frac{N_{thieves in law_j}}{Population_{1989_j}} + 0.000001\right) - \text{density of thieves-in-law}$$

$Citrus_j$ - agroclimatic suitability for growing citrus fruits

X – a vector of control variables, including logs of a municipality's population in 1989 and area as well as their squares, dummy for "special cities."², PSU elevation, and individual-level characteristics: age and its square, gender, ethnicity, rural residence, religious affiliation and religiosity, educational attainment, marital status, log of equalized income per household member and its square, and work situation,

and e – an error term.

Unless indicated otherwise, we use OLS to estimate the models (in the case of binary dependent variables, this turns the model into linear probability model or LPM).

Table 1 presents the characteristics of the sample.

Figure 1 maps the spatial distribution of citrus suitability, and figure 2 – thieves-in-law density. Citrus-suitable areas are located in the coastal areas in Western Georgia. Thieves-in-law density also exhibits a clear east-west trend. The coastal location and warmer climate might affect both organized crime and pro-market preferences through alternative channels, like economic development and openness to trade and foreign contacts.³ We control for geographic coordinates of PSUs in our specifications. Furthermore, we discuss in a separate section how these alternative explanations are inconsistent with the available data.

4 Results

Table 2 reports the first-stage results for our 2SLS approach, in which thieves-in-law density is regressed on *citrus suitability* (equation (1.1)). In columns 1-4 we report the results for

² This category includes Tbilisi, Batumi, Kutaisi, Poti, and Rustavi – the five most important cities in Georgia which are not centers of surrounding rural municipalities.

³ In the post-Soviet space, foreign trade links across former Soviet states are part of the historical legacies of communism and survived from the Soviet Union with existing connections and networks (e.g., Lankina et. al. 2016b; Libman and Obydenkova 2014).

the density of thieves-in-law who lived in a municipality. Column 1 reports the results only with the basic control variables, municipality-level (logs of a municipality's population in 1989 and area as well as their squares, special city dummy) and individual-level (age and its square, ethnicity, rural residence). Column 2 extends the set of control variables, adding religious affiliation and religiosity, educational attainment, marital status, log of equalized income per household member and its square, and work situation (whether a person employed, unemployed, student, or retired, as well as size and ownership of their employer). Column 3 controls additionally for latitude and longitude in order to prove that a spatial trend cannot explain the results. Since *Thieves-in-law* is a logarithmic variable, and *Citrus suitability* is a proportion, the coefficients of interest should be interpreted as semi-elasticities. Column 4 adds the control for elevation. Since suitability for citrus is heavily correlated with elevation, this can be considered a hard test for our empirical strategy. Columns 5-8 repeat these estimations but with the density of locally born thieves-in-law.

The relationship between citrus suitability and thieves-in-law density is statistically significant at the 1-percent level across the specifications. The size of the effect is also very substantial: a 1 s.d. increase in the fraction of residents living in citrus-suitable PSUs (which itself corresponds to a 35 p.p. increase in the share of such population) is associated with 49 to 62-percent increase in the per capita number of thieves-in-law who lived in a municipality, and with 44 to 54-percent increase in per capita number of thieves-in-law born there (since I take log of the number of thieves-in-law, the coefficients are interpreted as semi-elasticities). These results confirm the validity of our empirical strategy.

Table 3 presents OLS results for our key dependent variable, i.e., the naïve estimation of historical persistence effects ignoring the endogeneity issues. Panel A reports the results with *Thieves-in-Law (lived)* as the main explanatory variable, and Panel B reports the results with *Thieves-in-Law (born)* as one. Columns 1-4 present the results for support for government ownership of businesses, and columns 5-8 – aversion to competition. Control variables are introduced in the same order as in the Table 2. The coefficients at the thieves-in-law density variable are uniformly negative but not significant at the conventional levels. However, thieves-in-law density is an endogenous variable, and it is hard to *ex ante* predict the direction of bias of its coefficients.

Table 4 reports the results from 2SLS estimation, instrumenting *Thieves-in-law* with *Citrus suitability* (equation (1.2)). As in Table 3, Panel A reports the results for the number of thieves-in-law who lived in a municipality, and Panel B – for the number born there. Unlike the OLS, the 2SLS results are negative and also statistically significant. They are also consistently greater in magnitude than the OLS results, suggesting that the former are biased downwards. The coefficients at *Thieves-in-Law* survive controlling for the extended set of socio-demographic controls, geographic coordinates, and elevation. The coefficients are also interpreted as semi-elasticities. A 10-percent increase in *Thieves-in-law (lived)* is associated with a 0.25-0.32 s.d. decrease in support for government ownership and with a 0.2-0.31 s.d. decrease in aversion to competition. The same increase in *Thieves-in-law (born)* is associated with a 0.28-0.36 s.d. decrease in support for government ownership and with a 0.25-0.38 decrease in aversion to competition.

In order to rule out weak instrument concerns, we report first-stage F statistics, in this case, heteroscedasticity-robust Kleibergen-Paap rk Wald F statistics (Kleibergen and Paap, 2006) for all the 2SLS regressions. The statistics are all above 10 and exceed Stock-Yogo critical values for at least 15 percent IV relative bias (Stock and Yogo, 2005) in all the specifications, except two of them with *Thieves-in-law (born)* as the instrumented variable and only basic controls, where the F statistics are slightly below 10. This indicates that the weak instrument problem generally does not challenge our empirical strategy.

Therefore, provided our instrument satisfies the exclusion restriction, our results indicate that the Soviet-era shadow economy increased support for private entrepreneurship and competition. We attempt several placebo tests in the following sections to justify the exclusion restriction.

5 Placebo Tests

The most obvious challenge to our identification strategy is the non-random spatial distribution of both citrus suitability and thieves-in-law activity. It might be the case that citrus suitability affects pro-market preferences through channels other than Soviet-era shadow economy: for example, due to being associated with warmer climate and coastal location, it might promote economic development and international contacts. This does not seem likely, since, as we have mentioned before, after the onset of the transition, citrus agriculture in the West of Georgia experienced a decline due to low foreign demand: according to the Observatory of Economic

Complexity, citrus export amounted to less than 1% of the Georgian exports in 2011-2013 (Observatory of Economic Complexity, n.d.). Still, we use the placebo test approach to deal with this challenge, as described in the introduction.

Table 5 conducts this placebo test directly. We observe several proxies for economic development: higher education (university-level degree), log equalized household income (using the OECD-modified scale), a set of dummies for being unemployed, employed, self-employed, and having a public sector job. Only basic controls (municipality population and area, special city dummy, gender, age, ethnicity, and rural or urban residence) are inserted into the regressions since the dependent variables are themselves parts of the extended control set and measure a tightly related set of concepts, so we are agnostic about the direction of causality between them.

The table indicates that the respondents in the citrus-suitable part of Georgia are no different from others in terms of income and are equally likely to have a job or higher education; they are less likely to be self-employed. Therefore, citrus suitability did not affect pro-market preferences through the economic development channel.

In Tables 6 and 7, we investigate another alternative explanation, i.e., that people residing in the citrus-suitable areas have more intensive contact with foreigners. In Table 6, we consider the relationship between citrus suitability and a respondent's approval of doing business with foreigners (a binary outcome). Our intuition is that if our baseline results are indeed driven by the fact that the residents of the citrus-suitable areas appreciate increased opportunities for international contacts brought about by the market reforms, we would expect them to be more supportive of various kinds of contacts with people of foreign nationality. However, we discover that the coefficients at the *Citrus suitability* are not significant, except for a marginally significant negative coefficient for doing business with the Turks, and have different signs in the regressions with different dependent variables. The results for approval of women of a respondent's ethnicity marrying foreigners (also a binary outcome) are very similar, except the coefficients of interest are never significant, even at the 10-percent level.

Table 8 presents the association between the *Citrus suitability* and knowledge of the two foreign languages available in the Caucasus Barometer: English and Russian. The coefficient at the *Citrus suitability* for English is very small in magnitude and insignificant, but for Russian it is positive and statistically significant. This is suggestive evidence corroborating our theory since

Russian was important for shadow entrepreneurs to deal with business partners and consumers from other parts of the Soviet Union.

Another opportunity to test our instrument's validity is to resort to pre-Soviet data. Since the core of our argument is the unique role of citrus fruits in creating the shadow economy under the Soviet regime, we do not expect to see any effect of citrus suitability on the Tsarist-era outcomes that have been shown to affect today's political ideologies. In these placebo tests, we examine two dependent variables. First, we consider fraction of bourgeois estates – merchants and *meschane* (petty bourgeoisie) according to the 1897 census (the only general census in the Russian Empire), shown to matter for familial transmission of entrepreneurial values, regional democracy and media freedom (Lankina, Libman, 2021; Lankina, Libman and Obydenkova, 2016b; Nazarov and Obydenkova, 2020). Also, a high share of petty traders and artisans could precipitate the emergence of the mafia due to greater demand for protection when the state capacity was weak (Bandiera, 2003; Gambetta, 1996; Varese, 1994).

Second, we use data on the intensity of unrest during the 1905-1907 Russian revolution. Although a uniform measure is hard to find, we collect data on the number of weeks during which the Tsarist government reported unrest in specific places from Tsagareishvili (1956). Though it is undeniable that participants of the 1905 revolution could be influenced by a variety of possible motives, including a desire for more substantial civil rights, representative government, or national self-determination, in Georgia, the revolutionary movement was dominated by the Marxists, though mainly by the relatively less radical Menshevik faction (Suny, 1994, 145). Moreover, the 1905-1907 unrest was particularly intense in Georgia. Unlike the Georgian Democratic Republic proclaimed in 1918, it was depicted positively by Soviet propaganda and historiography, with books published on the topic and monuments erected to commemorate the events. This policy of glorification could also increase the susceptibility of the locals to Soviet indoctrination, in a similar vein to the results in Laudenbach, Malmendier, and Niessen-Ruenzi (2020), who show that residents of the GDR's showcase cities have lower stock market participation due to their higher receptivity to the Communist propaganda. Therefore, checking correlations of citrus suitability with the intensity of 1905-1907 unrest is an important step to justify the exclusion restriction.

Unfortunately, both pre-1917 variables can be collected only at the level of *uezd* – second-level administrative-territorial units of the Russian Empire. As of to 1897, the territory of today's

Georgia roughly corresponded to just 17 uezds of the Tiflis and Kutais Provinces (*guberniya*). Therefore, regression coefficients and especially standard errors should be treated with caution. We match these uezds to the contemporary municipalities via locations of the municipalities' administrative centers to calculate uezd-level values of *Citrus suitability*.

In Table 9, we present the results with the share of the pre-1917 bourgeoisie as the dependent variable. All the regressions are OLS; Panel A presents the results with citrus suitability on the right-hand side, and Panel B replaces it with thieves-in-law density. Variable transformations are the same as in the rest of the paper.

We also introduce a set of control variables akin to the basic controls we use in other tables, obtained from the same 1897 census: logs of population and population density, urbanization rate, the share of ethnic Georgians (during the 1897 census, only data on native language were collected; we consider all the speakers of the Kartvelian languages as ethnic Georgians). To avoid loss of statistical power, we insert these controls one by one and afterward simultaneously.

Reassuringly, *Citrus suitability* is not significant in any specification. Out of all the control variables, only the urbanization rate is statistically significant and positively related to the share of bourgeois estates. Moreover, the coefficient at *Citrus suitability* is actually negative in the majority specifications, therefore implying that citrus-growing areas had, in fact, a lower prevalence of bourgeoisie before 1917.

Table 10 repeats the same analysis but with the intensity of 1905-1907 unrest, except we add the share of bourgeois estates from the previous models as a control variable. Since the dependent variable is count data, we use Poisson regression. *Citrus suitability* is also not significant in most specifications, and its sign varies depending on specification.

6 Mechanisms

Why has the legacy of the shadow economy survived in the decades after the onset of the transition? We have shown in our previous estimations that there are little observable differences in socioeconomic outcomes, both historic and contemporary, between citrus-producing areas and other parts of Georgia. Therefore, it is unlikely that skills or resources acquired in the Soviet-era shadow economy directly benefited those living in areas where the shadow market used to be prevalent.

As we have argued above, another potential mechanism at work deals with the social legitimacy of private entrepreneurship and the perceived fairness of market outcomes. We expect that the people who live in areas with a high prevalence of shadow economy would be more likely to consider market outcomes fair. This might be both due to them having better ability to observe the efficiency of the market economy when compared to the central planning or due to motivated reasoning since people believing in the fairness of market outcomes are more likely to succeed in the market economy (Benabou and Tirole, 2006).

The concepts mentioned above are hard to measure directly. Therefore, we use the question from the CB asking to which extent a respondent agrees with the statement "I am fairly compensated." This variable is coded as a Likert scales with values "Completely/somewhat agree/disagree", 1 standing for full disagreement and 4 for full agreement. Only employed and self-employed respondents answered this question.

Another dimension is whether a person works in a private organization or the public sector. The fair compensation question reflects the legitimacy of private entrepreneurship only for those whose income is determined by the market rather than by the government. If the respondents living in the areas with higher prevalence of the Soviet-era shadow economy are more satisfied with their compensation if the market determines their income, we would interpret this as a manifestation of the social legitimacy channel.

Therefore, we estimate the following regression:

$$\begin{aligned} Fair\ Compensation_{ij} &= Shadow\ Economy_j + PublicSector_{ij} + Shadow\ Economy_j \\ &\quad * PublicSector_{ij} + X_{ij} + e_{ij} \end{aligned} \tag{2.1}$$

where i indicates an individual,

j – a municipality,

$Shadow\ Economy_j$ – prevalence of shadow economy (either *Thieves in Law_j* or *Citrus_j*),

$PublicSector_{ij}$ – dummy for whether a person’s income primarily by the market or by the state (we use either dummy for public sector employment).

X – a vector of control variables described above,

and e – an error term.

As a robustness check, we concentrate only on those respondents whose income is most affected by market fluctuations, i.e. those having their own business. We estimate the following regression:

$$\begin{aligned} Fair\ Compensation_{ij} &= Shadow\ Economy_j + OwnBusiness_{ij} + Shadow\ Economy_j \\ &\quad * OwnBusiness_{ij} + X_{ij} + e_{ij} \end{aligned} \tag{2.2}$$

where $OwnBusiness_{ij}$ stands for the dummy for an individual having their own business with or without employees.

We use OLS to estimate these regressions.

The results of estimating the equations (2.1) and (2.2) are presented in Table 12. Panel A performs the analysis with citrus suitability as a proxy for the shadow economy prevalence, and Panel B – with the thieves-in-law density. In both panels, columns 1 and 2 interact the shadow economy variable with the public sector dummy, thus estimating the equation (2.1). All the regressions control for a standard set of demographic and socioeconomic controls, and even-numbered columns control additionally for latitude and longitude. Importantly, we control for income and its square; therefore, our findings are valid irrespective of the respondents’ actual income.

The interaction terms are statistically significant and negative across both panels. Their absolute size is greater or comparable to the main coefficients at the shadow economy variables. Therefore, we find that, at the same objective income level, the respondents living in the high shadow economy areas find their compensation fairer, but only if they work outside the public sector. Columns 3 and 4 further narrow down the definition of earning a market income to those persons who have their own business, with or without employees, consistently with the equation

(2.2). We find the main coefficients at the shadow economy variables to be statistically and economically indistinguishable from zero, while the interaction terms are highly significant. This implies that not just private sector employees but rather entrepreneurs are those who are more content with their income in the high shadow economy areas.

7 Conclusions

We examine how Soviet-era shadow entrepreneurship affected support for the market economy in Georgia – an environment uniquely suitable for studying the consequences of the shadow economy due to its unusually high prevalence in the country and the country's outstanding institutional reforms.

We have an opportunity to exploit within-country differences in the prevalence of shadow entrepreneurship due to an exogenous factor – the suitability of the Western part of Georgia for growing sub-tropical crops which remained a subject of shortages during most of the Soviet era. We show that these areas had a higher density of thieves-in-law, which we use as a proxy for the shadow economy. Using the instrumental variable strategy, we document that the residents of the citrus-suitable part of Georgia, which historically had a higher prevalence of shadow economy, have more pro-market views today. We use several placebo tests to rule out alternative explanations and use data on self-perceived fairness of one's compensation to argue that social legitimacy of private entrepreneurship is a possible mechanism behind our findings.

These results imply that the Communist-era experiences still drive support for the reform agenda in the post-Communist countries. People from areas where non-state institutions undermined the Communist rule, and where the market economy was able to successfully compensate for centralized planning failures are significantly less likely to hold pro-Soviet views. Our results also imply that the shadow economy and organized crime can be crucial development factors when property rights lack security and private entrepreneurship is discouraged. These findings are generalizable to other contexts and might be a valuable element in explaining why citizens of some liberal democracies are more reluctant to support government intervention into the economy than in others (see e.g. Alesina and Glaeser (2004) for comparison of the United States and Europe in this respect).

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Table 1.

Variable	Obs	Mean	Std. Dev.	Min	Max
Support for government ownership	5753	4.63	2.98	1	10
Aversion of competition	4017	3.14	2.43	1	10
Log Thieves-in-law per capita (lived)	6904	-9.53	1.87	-13.82	-7.31
Log Thieves-in-law per capita (born)	6904	-9.18	1.63	-13.82	-7.17
Citrus suitability, municipality	6926	0.17	0.35	0	1
Log Population 1989, municipality	6904	11.96	1.35	8.77	14.05
Log area, municipality	6904	6.32	0.94	4.09	8.02
Age	6922	49.28	18.41	18	103
Female	6922	0.63	0.48	0	1
Ethnicity: Georgian	6914	0.86	0.35	0	1
Ethnicity: Armenian	6914	0.05	0.22	0	1
Ethnicity: Azeri	6914	0.06	0.24	0	1
Ethnicity: Other minority	6914	0.02	0.15	0	1
Location type: Capital	6922	0.40	0.49	0	1
Special city	6926	0.40	0.49	0	1
Education: No primary education	6909	0.01	0.09	0	1
Education: Primary education	6909	0.02	0.15	0	1
Education: Incomplete secondary education	6909	0.08	0.27	0	1
Education: Completed secondary education	6909	0.29	0.45	0	1
Education: Secondary technical education	6909	0.25	0.43	0	1
Education: Incomplete higher education	6909	0.04	0.18	0	1
Education: Completed higher education	6909	0.32	0.47	0	1
Marital status: Never married	6872	0.16	0.37	0	1
Marital status: State marriage only	6872	0.35	0.48	0	1
Marital status: Religious marriage only	6872	0.03	0.18	0	1
Marital status: State and religious marriage	6872	0.18	0.38	0	1
Marital status: Cohabitation	6872	0.04	0.20	0	1
Marital status: Divorced	6872	0.03	0.17	0	1
Marital status: Separated	6872	0.02	0.13	0	1
Marital status: Separated	6872	0.19	0.39	0	1
Log equalized household income	6110	4.34	0.99	0	7.09
Employment status: Retired	6901	0.24	0.43	0	1
Employment status: Student	6901	0.03	0.17	0	1
Employment status: Houseperson	6901	0.14	0.34	0	1
Employment status: Employed	6901	0.21	0.41	0	1
Employment status: Unemployed	6901	0.22	0.42	0	1
Employment status: Self-employed	6901	0.13	0.34	0	1
Employment status: Disabled	6901	0.02	0.14	0	1
Employment status: Other	6901	0.00	0.06	0	1
Type of employment: Own business without employees	6899	0.10	0.30	0	1
Type of employment: Own business with employees	6899	0.01	0.12	0	1

Variable	Obs	Mean	Std. Dev.	Min	Max
Type of employment: Employee in a small family business	6899	0.02	0.14	0	1
Type of employment: Employee in a medium/big private organization	6899	0.08	0.28	0	1
Type of employment: Employee in a state organization	6899	0.10	0.30	0	1
Type of employment: Employee in a foreign-owned organization	6899	0.01	0.09	0	1
Type of employment: Employee in an NGO	6899	0.00	0.06	0	1
Type of employment: Other	6899	0.01	0.09	0	1
Attending religious services: Every day	6788	0.01	0.07	0	1
Attending religious services: More than once a week	6788	0.04	0.19	0	1
Attending religious services: Once a week	6788	0.13	0.33	0	1
Attending religious services: At least once a month	6788	0.21	0.40	0	1
Attending religious services: Only on special holidays	6788	0.25	0.43	0	1
Attending religious services: Less often	6788	0.24	0.43	0	1
Attending religious services: Never	6788	0.13	0.34	0	1
Importance of religion in life: Not at all important	6778	0.01	0.09	0	1
Importance of religion in life: Not very important	6778	0.06	0.25	0	1
Importance of religion in life: Rather important	6778	0.49	0.50	0	1
Importance of religion in life: Very important	6778	0.43	0.50	0	1
Nonreligious	6922	0.01	0.09	0	1
Muslim	6922	0.09	0.29	0	1
Other religion, except Orthodoxy	6922	0.01	0.09	0	1
Latitude	6861	43.79	1.33	41.64	46.27
Longitude	6861	41.90	0.32	41.28	43.04
Elevation	6861	461.51	356.07	4.98	2051.00

Table 2. First stage regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	Thieves-in-law (lived)				Thieves-in-law (born)			
Citrus suitability	1.541*** (0.421)	1.673*** (0.380)	1.797*** (0.308)	1.421*** (0.298)	1.273*** (0.421)	1.367*** (0.368)	1.556*** (0.254)	1.299*** (0.231)
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Latitude and longitude	No	No	Yes	Yes	No	No	Yes	Yes
Elevation	No	No	No	Yes	No	No	No	Yes
Observations	6,892	5,853	5,818	5,818	6,892	5,853	5,818	5,818
R-squared	0.616	0.633	0.703	0.718	0.634	0.686	0.775	0.785

Note. Citrus suitability is measured as the share of respondents in a municipality living in PSUs suitable for growing citrus fruits. Thieves-in-law is the log number thieves-in-law who either lived or were born in a municipality normalized by its 1989 population. Basic controls include municipality-level characteristics: logs of the population in 1989 and area as well as their squares, special city dummy, and individual-level characteristics: age and its square, gender, ethnicity, and rural residence. Additional controls include religious affiliation and religiosity, educational attainment, marital status, log of equalized income per household member and its square, and work situation. All regressions include constant. Standard errors clustered at the municipality level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3. Baseline results: OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	Support for state ownership				Aversion of competition			
<i>Panel A</i>								
Thieves-in-law (lived)	-0.131 (0.123)	-0.161 (0.129)	-0.0517 (0.111)	-0.0252 (0.123)	-0.0949 (0.112)	-0.0967 (0.117)	-0.0966 (0.114)	-0.0593 (0.137)
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Latitude and longitude	No	No	Yes	Yes	No	No	Yes	Yes
Elevation	No	No	No	Yes	No	No	No	Yes
Observations	5,725	4,908	4,876	4,876	3,989	3,374	3,358	3,358
R-squared	0.060	0.081	0.092	0.093	0.030	0.059	0.058	0.061
<i>Panel B</i>								
Thieves-in-law (born)	-0.183 (0.140)	-0.271* (0.156)	-0.146 (0.124)	-0.122 (0.135)	-0.0914 (0.114)	-0.100 (0.125)	-0.0973 (0.126)	-0.0457 (0.140)
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Latitude and longitude	No	No	Yes	Yes	No	No	Yes	Yes
Elevation	No	No	No	Yes	No	No	No	Yes
Observations	5,725	4,908	4,876	4,876	3,989	3,374	3,358	3,358
R-squared	0.062	0.084	0.093	0.093	0.029	0.058	0.058	0.061

Note. Thieves-in-law is the log number of thieves-in-law who either lived or were born in a municipality normalized by its 1989 population. Basic controls include municipality-level characteristics: logs of the population in 1989 and area as well as their squares, special city dummy, and individual-level characteristics: age and its square, gender, ethnicity, and rural residence. Additional controls include religious affiliation and religiosity, educational attainment, marital status, log of equalized income per household member and its square, and work situation. All regressions include constant. Standard errors clustered at the municipality level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4. Baseline results: 2SLS

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Support for state ownership				Aversion of competition			
<i>Panel A</i>								
Thieves-in-law (lived)	-0.879**	-0.862**	-0.742**	-0.954*	-0.557**	-0.484**	-0.663**	-0.760**
	(0.363)	(0.352)	(0.366)	(0.496)	(0.235)	(0.210)	(0.305)	(0.378)
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Latitude and longitude	No	No	Yes	Yes	No	No	Yes	Yes
Elevation	No	No	No	Yes	No	No	No	Yes
Observations	5,725	4,908	4,876	4,876	3,989	3,374	3,358	3,358
R-squared	-0.031	0.004	0.030	-0.007	-0.025	0.021	-0.009	-0.032
Kleibergen-Paap rk Wald F statistic	12.77	18.23	30.17	19.43	13.90	18.95	28.32	18.98
<i>Panel B</i>								
Thieves-in-law (born)	-1.059**	-1.053***	-0.844**	-1.020**	-0.704**	-0.618**	-0.815**	-0.912**
	(0.416)	(0.376)	(0.381)	(0.477)	(0.331)	(0.281)	(0.372)	(0.452)
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Latitude and longitude	No	No	Yes	Yes	No	No	Yes	Yes
Elevation	No	No	No	Yes	No	No	No	Yes
Observations	5,725	4,908	4,876	4,876	3,989	3,374	3,358	3,358
R-squared	-0.029	0.022	0.055	0.037	-0.037	0.016	-0.007	-0.023
Kleibergen-Paap rk Wald F statistic	8.534	12.33	32.53	27.20	8.720	12.13	25.85	19.43

Note. Thieves-in-law is instrumented with Citrus suitability. Basic controls include municipality-level characteristics: logs of the population in 1989 and area as well as their squares, special city dummy, and individual-level characteristics: age and its square, gender, ethnicity, and rural residence. Additional controls include religious affiliation and religiosity, educational attainment, marital status, log of equalized income per household member and its square, and work situation. All regressions include constant. Standard errors clustered at the municipality level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5. Placebo test: Economic development

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Higher education	Log equalized household income	Unemployed	Has a job	Self-employed	Works in the public sector
Citrus suitability	0.0154 (0.0250)	0.0799 (0.0871)	0.108*** (0.0297)	-0.0249 (0.0274)	-0.0671** (0.0278)	-0.00229 (0.0111)
Basic controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,879	6,082	6,872	6,872	6,872	6,869
R-squared	0.103	0.066	0.107	0.078	0.080	0.030

Note. Citrus suitability is measured as the share of respondents in a municipality living in areas suitable for growing citrus fruits. Basic controls include municipality-level characteristics: logs of the population in 1989 and area as well as their squares, special city dummy, and individual-level characteristics: age and its square, gender, ethnicity, and rural residence. All regressions include constant. Standard errors clustered at the municipality level are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 6. Placebo test: Attitudes towards doing business with foreigners.

Dependent variable - Approval of coethnics doing business with...	(1)	(2)	(3)	(4)	(5)
	Americans	Russians	Turks	English	Europeans
Citrus suitability	-0.00520 (0.0318)	0.00903 (0.0249)	-0.0950* (0.0529)	0.0200 (0.0441)	0.0163 (0.0399)
Basic controls	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes
Observations	5,542	5,622	5,588	3,765	1,795
R-squared	0.105	0.058	0.052	0.118	0.143

Note. Citrus suitability is measured as the share of respondents in a municipality living in PSUs suitable for growing citrus fruits. Basic controls include municipality-level characteristics: logs of the population in 1989 and area as well as their squares, special city dummy, and individual-level characteristics: age and its square, gender, ethnicity, and rural residence. Additional controls include religious affiliation and religiosity, educational attainment, marital status, log of equalized income per household member and its square, and work situation. All regressions include constant. Standard errors clustered at the municipality level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7. Placebo test: Attitudes towards doing women marrying foreigners

Dependent variable - Approval of coethnic women marrying...	(1) Americans	(2) Russians	(3) Turks	(4) English	(5) Europeans
Citrus suitability	-0.0108 (0.0393)	0.0218 (0.0460)	-0.0544 (0.0398)	0.0231 (0.0501)	-0.0319 (0.0697)
Basic controls	Yes	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes	Yes
Observations	5,552	5,600	5,650	3,774	1,812
R-squared	0.077	0.067	0.061	0.092	0.096

Note. Citrus suitability is measured as the share of respondents in a municipality living in PSUs suitable for growing citrus fruits. Basic controls include municipality-level characteristics: logs of the population in 1989 and area as well as their squares, special city dummy, and individual-level characteristics: age and its square, gender, ethnicity, and rural residence. Additional controls include religious affiliation and religiosity, educational attainment, marital status, log of equalized income per household member and its square, and work situation. All regressions include constant. Standard errors clustered at the municipality level are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 8. Placebo test: Knowledge of foreign languages

Dependent variable - Knowlegde of...	(1)	(2)
	Russian	English
Citrus suitability	0.275*** (0.0697)	-0.000474 (0.0342)
Basic controls	Yes	Yes
Additional controls	Yes	Yes
Observations	5,805	5,689
R-squared	0.370	0.417

Note. Citrus suitability is measured as the share of respondents in a municipality living in PSUs suitable for growing citrus fruits. Basic controls include municipality-level characteristics: logs of the population in 1989 and area as well as their squares, special city dummy, and individual-level characteristics: age and its square, gender, ethnicity, and rural residence. Additional controls include religious affiliation and religiosity, educational attainment, marital status, log of equalized income per household member and its square, and work situation. All regressions include constant. Standard errors clustered at the municipality level are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 9. Placebo test: Pre-1917 bourgeoisie

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Share of bourgeoisie, 1897					
Citrus suitability	-0.0374 (0.0391)	-0.0350 (0.0283)	-0.0901 (0.0698)	-0.0463 (0.0445)	0.000909 (0.0227)	-0.0505 (0.0431)
Urbanization rate, 1897		0.386*** (0.0352)				0.359*** (0.0404)
Log population density, 1897			0.0574 (0.0394)			0.0353 (0.0303)
Log population, 1897				0.0478 (0.0444)		-0.0322 (0.0318)
Share of Georgians, 1897					-0.103 (0.0732)	-0.0297 (0.0293)
Observations	17	17	17	17	17	17
R-squared	0.023	0.839	0.210	0.142	0.212	0.871

Note. The unit of observation is uezd. The share of bourgeoisie is defined as the sum of shares of merchants and meschane in an uezd population in 1897. Citrus suitability is measured as the share of respondents in a former uezd living in PSUs suitable for growing citrus fruits. The share of Georgians is defined as the share of the population who speak any Kartvelian language as their native. All regressions include constant. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 10. Placebo test: 1905-1907 unrest

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Number of weeks with unrest, 1905-1907						
Citrus suitability	0.232 (0.270)	0.445 (0.275)	-0.642** (0.293)	0.408 (0.290)	0.276 (0.289)	0.720** (0.290)	-0.0909 (0.441)
Urbanization rate, 1897		2.845*** (0.326)					4.699*** (1.472)
Log population density, 1897			1.220*** (0.169)				0.0995 (0.387)
Log population, 1897				1.376*** (0.181)			0.746* (0.402)
Share of Georgians, 1897					-0.116 (0.272)		1.141** (0.496)
Share of bourgeoisie, 1897						6.452*** (0.896)	-5.726 (3.903)
Observations	17	17	17	17	17	17	17

Note. Entries are coefficients from estimating a Poisson model. The unit of observation is uezd. Citrus suitability is measured as the share of respondents in a former uezd living in PSUs suitable for growing citrus fruits. The share of Georgians is defined as the share of the population who speak any Kartvelian language as their native. The share of the bourgeoisie is defined as the sum of shares of merchants and meschane in an uezd population in 1897. All regressions include constant. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 12. Social legitimacy of entrepreneurship

	(1)	(2)	(3)	(4)
Dependent variable	Agreement with "I am fairly compensated"			
<i>Panel A</i>				
Citrus suitability	0.359*** (0.125)	0.445*** (0.151)	0.0263 (0.0881)	0.103 (0.120)
Public sector	-0.0850 (0.110)	-0.103 (0.110)		
Citrus suitability * Public sector	-0.466** (0.201)	-0.459** (0.194)		
Own business			0.0167 (0.0976)	0.00326 (0.0993)
Citrus suitability * Own business			0.678*** (0.140)	0.674*** (0.128)
Basic controls	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes
Latitude and longitude	No	Yes	No	Yes
Observations	1,990	1,980	1,990	1,980
R-squared	0.159	0.162	0.162	0.165
<i>Panel B</i>				
Thieves-in-law	0.0516** (0.0258)	0.0672** (0.0324)	-0.00561 (0.0266)	0.00925 (0.0336)
Public sector	-0.718** (0.274)	-0.722** (0.273)		
Thieves-in-law * Public sector	-0.0626** (0.0241)	-0.0617** (0.0242)		
Own business			0.983*** (0.268)	0.937*** (0.263)
Thieves-in-law * Own business			0.0967*** (0.0278)	0.0922*** (0.0269)
Basic controls	Yes	Yes	Yes	Yes
Additional controls	Yes	Yes	Yes	Yes
Latitude and longitude	No	Yes	No	Yes
Observations	1,990	1,980	1,990	1,980
R-squared	0.154	0.158	0.158	0.161

Note. Citrus suitability is measured as the share of respondents in a municipality living in PSUs suitable for growing citrus fruits. Thieves-in-law is the log number of thieves-in-law who lived in a municipality plus 1 divided by its 1989 population. The public sector is a dummy for a respondent being employed in a state organization. Own business is a dummy for a respondent having their own business with or without employees. Basic controls include municipality-level characteristics: logs of the population in 1989 and area as well as their squares, special city dummy, and individual-level characteristics: age and its square, gender, ethnicity, and rural residence. Additional controls include religious affiliation and religiosity, educational attainment, marital status, log of equalized income per household member and its square, and work situation. All regressions include constant. Standard errors clustered at the municipality level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

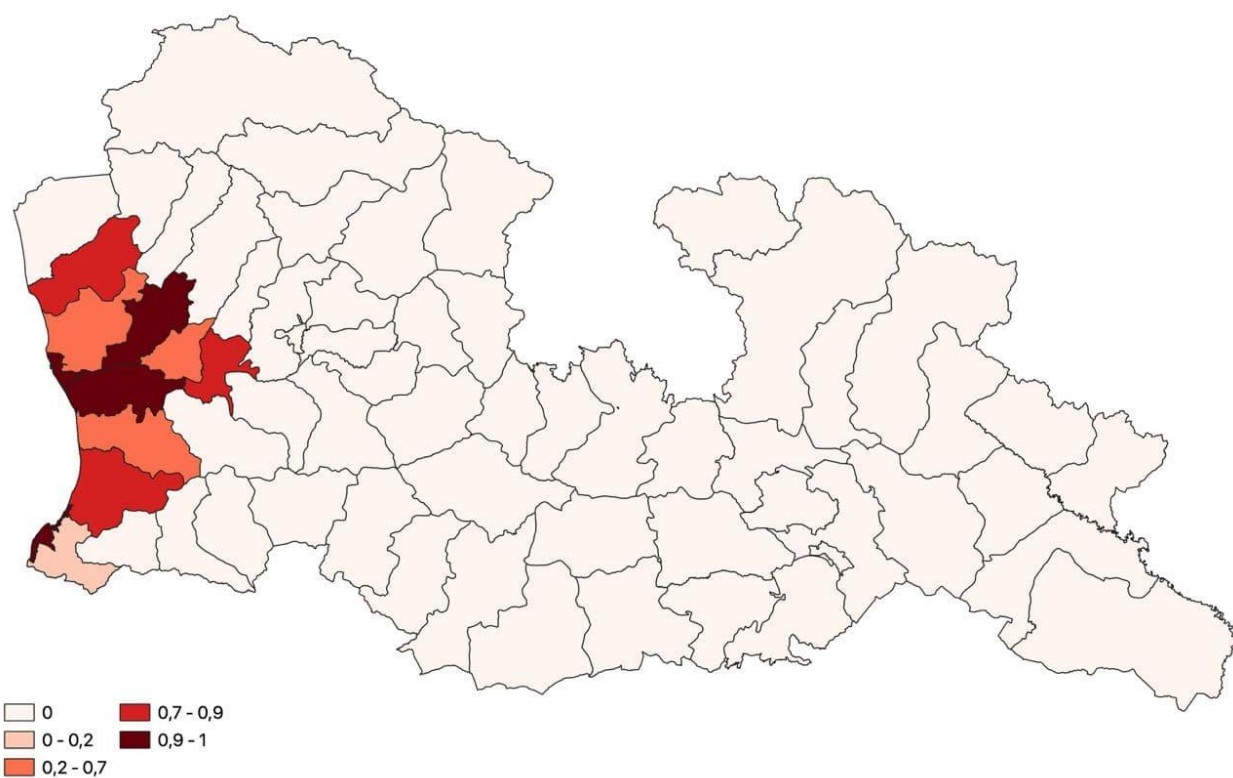


Fig. 1. Citrus suitability (% respondents living in PSUs suitable for growing citrus fruits)

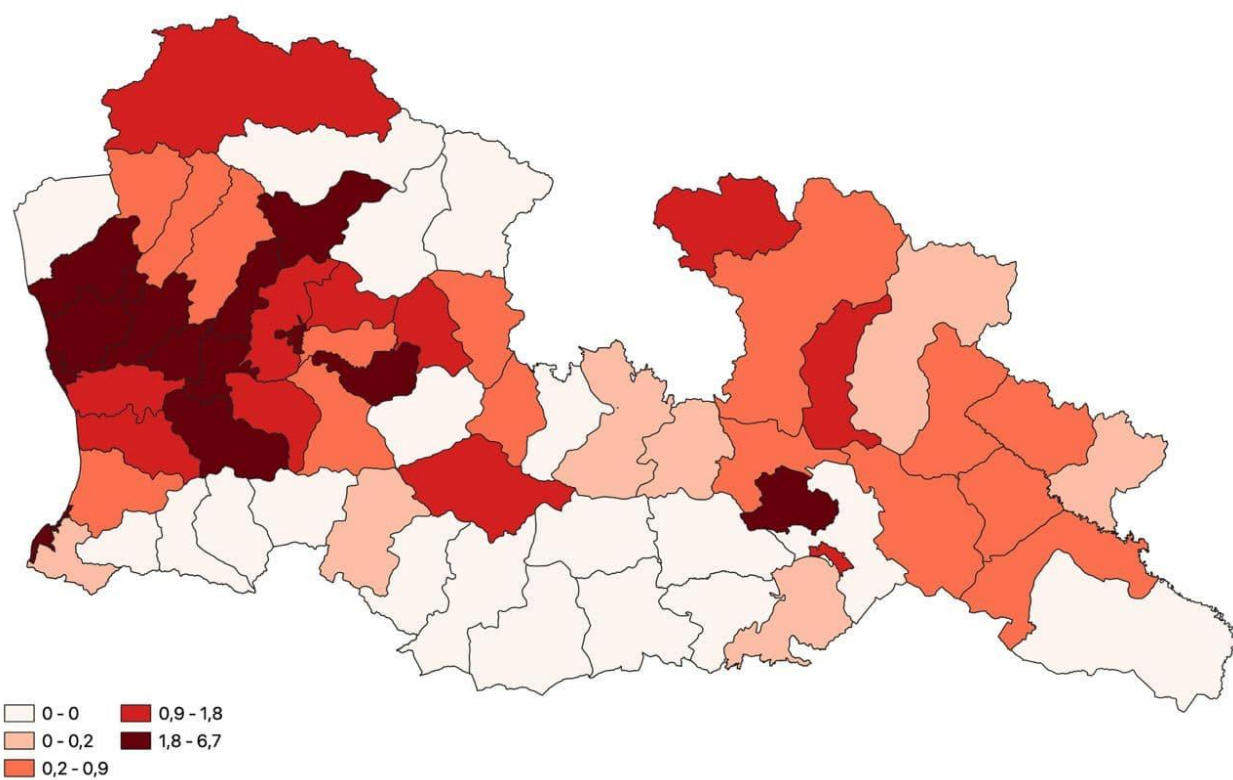


Fig. 2. Thieves-in-law per 10,000 residents, 1989