



Economic Persistence despite Adverse Policies: Evidence from Kyrgyzstan

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Economic persistence despite adverse policies: Evidence from Kyrgyzstan

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Abstract

We study the long-run persistence of relative economic well-being in the face of highly adverse government policies using a combination of rich historical and contemporaneous data sources from Kyrgyzstan. Even after controlling for unobservable local effects, the economic well-being (measured by income, expenditures, or assets) of Kyrgyz households in the 2010s strongly correlates with the early 20th-century average wealth of the tribes from which these households descend. The degree of economic inequality at the tribe level in the 2010s correlates with the within-tribe wealth inequality in the early 20th century. In terms of channels of persistence, we find support for the inter-generational transmission of human capital, relative status, political power, and cultural traits. Transmission of material wealth, differences in natural endowments, or geographic sorting cannot explain the observed long-run persistence.

Keywords: Wealth distribution, long-run persistence, inter-generational transmission, traditional institutions, tribe, clan, Kyrgyzstan.

JEL codes: D31, D15, O15, O17, N35.

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1 Introduction

Questions of increasing inequality and declining social mobility, and the role of government policies in affecting these trends, are at the forefront of public debates. Relatedly, economics has been experiencing a recent boom in research - both empirical and theoretical - on the distribution of income and wealth (see the reviews by Piketty and Zucman, 2015, and Benhabib and Bisin, 2018) and on inter-generational mobility in economic outcomes (see Clark, 2014, Chetty et al., 2014, and the review by Solon, 2018).

In this paper we analyze long-run persistence of the distribution in economic well-being in the face of massive (and violent) Soviet expropriative and redistributive policies, using a unique combination of rich historical and contemporaneous data from Kyrgyzstan. To guide our empirical analysis, we build a simple framework with multiple channels of inter-generational transmission of well-being with expropriative government policies. Applying this framework to our data, we document that even after controlling for unobservable local effects, the economic well-being (measured with income, expenditures, and assets) of Kyrgyz households in 2012 strongly correlates with the early 20th-century average wealth measures of the tribes to which the household heads belongs. Furthermore, the degree of economic inequality among tribe members today correlates with the within-tribe wealth inequality in the early 20th century. This persistence is surprising, given the extreme equalizing policies conducted by the Soviet government throughout the period from 1917 to 1991 (the collectivization drive, mass purges targeting the wealthy and the middle-class citizens, and the virtual absence of private property) and the Soviet campaigns to eradicate tribal identity.

Next, we focus on the potential channels behind this persistence. The Soviet policies allow us to rule out the standard channel of transmission of wealth or other tangible assets. By using the local-level geographic fixed effects, we exclude that the observed correlation is driven by natural endowment differences (in the location of tribes) or by geographic sorting of erstwhile richer tribes into better-endowed locations. Using information about the parents of respondents in the contemporaneous data, we find support for the transmission of intangible assets, such as human and social capital. During the Soviet period, there is a positive correlation between the pre-Soviet wealth of tribes and the relative position in society that members of these tribes reached, with respect to the type of occupation (skilled / unskilled) and sector of activity (agricultural / non-agricultural), although not in terms of years of formal education. We also document significant differences in tribe-level cultural traits. Finally, combining the pre-Soviet data with the 1970s data on the political elite of Kyrgyzstan, we find that the once-wealthier tribes exhibit a disproportionately larger representation in the Soviet-period political elite. This suggests that another important channel of persistence is the conversion of pre-Soviet wealth into social capital (or political power) under a regime highly restrictive of private property and wealth.

Our findings have important implications for the classic policy debate on inequality and social mobility. Vilfredo Pareto (1897) argued that *“In all places and at all times, the distribution of income remains*

the same. Neither institutional change nor egalitarian taxation can alter this fundamental constant of social sciences". Our findings lend support to the Pareto's Law, by showing that wealth taxation - even in its most extreme form as practiced by the Soviet government - does not seem to revert the fortunes within a society. This is because the groups that are ranked higher in terms of their pre-policy wealth adjust by shifting their effort to other non-taxable channels of inter-generational transmission of well-being and status.

Related literature

We contribute to two large strands of literature. The first focuses on the long-run persistence in relative wealth and income levels. The highly influential analysis of top incomes and upper tail of the wealth distribution, spearheaded by Piketty (2003) and by Piketty and Saez (2003), is unable to track the *same* households, families, or dynasties, and therefore cannot shed light on the issues of persistence and social mobility. An alternative (and complementary) approach consists in analyzing datasets that link these individual units across several generations, either through administrative records (see Chetty et al., 2014, 2017, for the United States; Boserup et al., 2016, for Denmark; and Adermon et al., 2018, and Black et al., 2020, for Sweden), or by relying on linking the units through surnames (Clark, 2014; for specific countries, see Clark and Cummins, 2015, for Britain; Barone and Mocetti, 2016, for Italy; Clark et al., 2017, for Australia). This literature agrees on the existence of persistence of economic well-being across generations, although the debate remains open regarding the degree of persistence. The studies linking parents and children and assessing the intergenerational correlation in income often find lower levels of persistence than studies involving more generations or using larger units (such as individuals sharing the same uncommon surname). In any case, there is considerable heterogeneity across time and places in multigenerational mobility (Solon, 2018). Our contribution is to study persistence in a context of strongly expropriative government policies, aimed precisely at halting persistence. In all the contexts studied so far, with the exception of China, there was relatively little disruption in the overall economic system and social life across generations. The analysis for China (see Clark 2014, chapter 9) compares people with the same surnames before and after the Cultural Revolution, and finds, similarly to our study, a surprisingly high degree of persistence in social status. Furthermore, the mechanism (within-clan selection of the most talented members and collective investment in their human capital) is affine to the mechanism based on tribal and clan-based political capital that we propose as one of the channels of persistence. An advantage of our analysis over the surnames-based method is that we can match all household records in a nationally representative survey (provided that the household head declared a tribe) while the analysis of surnames needs to focus on sufficiently rare surnames that can be tracked over time (which is a particularly challenging endeavour in the case of China).

The second strand of literature to which we contribute focuses on the role of traditional institutions play in economic development. Beside the extensive analysis of the caste system (see Munshi, 2019,

for a recent review of this literature), a small and growing literature in development economics and economic history has recently started to analyze the economic role played by institutions of clans and tribes. Some authors highlight the negative aspects of tribal and clan-based institutions. For example, Moscona et al. (2020) test the hypothesis that ethnic groups that are organized around ‘segmentary lineages’ (i.e. clan-based structures) are more prone to conflict, and find confirming evidence. Other scholars, on the contrary, underline the positive aspects of tribal institutions, such as solidarity norms and democratic culture. For example, Acemoglu and Robinson (2019) argue that the democratic culture of Germanic tribes in the Middle Ages was crucial for the political development of Europe, and was one of the two factors (the other being the centralized bureaucratic and political hierarchy inherited from the Roman Empire) that set off the virtuous cycle of political and economic development that eventually determined the rise of Europe as a world superpower. Greif and Tabellini (2010, 2017), De la Croix et al. (2018), and Enke (2019) use a combination of theoretical and historical analysis to compare the long-run trajectories of clan-based societies with societies based on more open social structures (such as corporations and guilds). They argue that clan-based societies have the advantage of having a lower cost of enforcing social cooperation (among clan members). However, the closeness of this system puts it at a disadvantage concerning the scale of cooperation and the dissemination of useful knowledge, in comparison to more open systems. This difference might have contributed to the divergence of the long-run development trajectories of China and Europe and to the rise of Europe as a human-capital intensive society. We contribute to this literature by showing that the tribal (and clan-based) social structure is highly resilient in the face of aggressive adverse government policies aimed at equalizing wealth distribution and undermining the traditional system (by deliberately replacing it with a more aggregate-level identity).

2 Historical context

We start by briefly describing the historical context, distinguishing between the pre-Soviet, Soviet, and post-Soviet periods. For each of these, we summarize the key changes in the political and economic context and highlight the roles that traditional tribal and clan-based institutions played in Kyrgyz people’s lives.

2.1 The Kyrgyzs in the early 20th century

Citizens of the Russian empire

A confederation of ethnically and linguistically close nomadic pastoralist tribes known today as the Kyrgyz people consolidated into three large groups of tribes in the early 16th - mid-18th century CE.¹ During the 19th century, some of the Kyrgyz tribes seek the protection of the Russian Empire (from the neighboring powerful Kokand kingdom), and gradually the Russians acquired military control of the entire territory of modern-day Kyrgyzstan.

The general strategy of the Russian Empire towards administering Kyrgyz territories was based on gradualism and to a large extent took into account the local institutional context. However, the administrative structure was such that the Kyrgyz tribes belonged to four different oblasts (regions) of the Empire and some authors argue that this division negatively affected the later consolidation of the Kyrgyz people into statehood (Asankanov et al., 2017: 96).

The abolition of serfdom in 1861 in Russia triggered the process of Russian peasant migration into Central Asia. This process started in Kyrgyzstan in the 1870s and accelerated in the 1890s and 1900s. It was a massive process (initially spontaneous, from 1889 on it was regulated by the government), so that by the end of the 19th century, the ethnic Kyrgyzs constituted only 60% of the population of the modern-day Kyrgyzstan's territory. Russian peasants mostly settled on the land better suited for agriculture. The rising land pressure on the Kyrgyz tribes put under strain the nomadic pastoralist economic system, and over time a part of the Kyrgyz population started to rely ever more on sedentary agriculture. This process was further facilitated by technological innovations in agriculture brought in by Russian settlers.

Towards the end of the 19th century, the Russian Empire fully converted the protectorate into a colony, by decreeing that the entire land of the Kyrgyz territory belonged to the Empire. Kyrgyz nomads were "granted" the usufruct rights over winter and summer pastures (but not over the transhumance routes); these rights could be inherited but not sold (Asankanov et al., 2017: 101).

The rising land pressure led to anti-Russian revolts, the most violent of which occurred in 1916. It covered most of the Northern Kyrgyzstan and spilled over into pillaging the peasant settler villages. The Empire sent massive military forces, and by the fall of 1916, the revolt was repressed. The persecutions induced a large number of Eastern Kyrgyz families to flee into China. The extreme weather conditions during this process had a huge human toll: according to some historians, almost 140 000 people died while fleeing (Asankanov et al., 2017: 105). The persecutions stopped in 1917 with the advent of the Soviet regime.

¹The first two - Ong Qanat ("the Right Wing") and Sol Qanat ("the Left Wing") - occupy the current-day Northern, Eastern, and Central Kyrgyzstan. The slightly less ethnically related Ichkilik ("the Inner") group occupies the territory of the Western Kyrgyzstan adjacent to the Ferghana valley.

Clan-based social and economic life

Kyrgyz society has long been structured by a complex system of kinship networks, with several layers of identity and social aggregation. There are three large tribal groups (wings), which consists of several tribes (*uruu*), further divided into clans (*wruk*) and sub-clans. Each of these units correspond to families whose male descendants belonged (or believed to belong) to the same lineage. Within a clan there is a clear hierarchy of sub-clans (the descendants of the elder brothers at each level are considered to be more important than those of the younger brothers). Traditionally, a clan was headed by an elderly male (*manap*), and the council of manaps of all the clans jointly ruled the tribe. There are about 35 main tribes (for a total population of ethnic Kyrgyzs of 400 880 individuals, according to the census data of 1910 that we use in the paper).

Rumyantsev (1916a) notes that until the end of the 19th century, “A manap ruled the group, defended in front of other manaps the interests of his bukara (the poorer relatives), helped it in the hardship years, ... the bukara had to work for its manap, and its poorest part was in total economic dependence from the manap” (Rumyantsev, 1916a: 88).

The Russian administrative reforms (and in particular the introduction of local elections) gradually weakened to some extent the importance of tribe leaders (manaps). Still, these kinship structures continued to influence virtually every aspect of social, economic, and political life of Kyrgyzs. Thus, political actions (defense/offense, settlement of large-scale land disputes, alliances with the Russian administration) were in the hands of the clans and clan elders. Disputes over pastures were extremely common, especially as the land pressure from Russian settlers started to increase.

A clan also actively intervened in and regulated the social behavior of its members. The socialization of the young generation into the norms of behavior was done not only by the parents and the close members of the family, but also by the sub-clan and clan members; an important part of this socialization involved passing the knowledge about the clan-based and tribal identity and the genealogical structure of the clan, the tribe, and the wing (Asankanov et al., 2017: 332-333). Marriages were often used as a way of reinforcing the strategic relationships and alliances between clans (Asankanov et al., 2017: 292).

The clan also played a major economic role. Seasonal migration (between winter and summer pastures) still prevailed at the early 20th century and was regulated by clans. Livestock (horses, sheep, and goats) was the private property of individual households, but pasture land (both in winter stops and in summer pastures) was owned by larger kinship groups. Individual households grouped into extended families (sub-divisions of clans) who spend the winter jointly in the valleys. Extended families had the use right over land at the winter stops. In the summer, the extended families migrate to higher-altitude pastures and met with other extended families belonging to the same clan. The summer pasture land was usually a closed-access common property of the clan.

An extended family typically consisted of rich and poor households. The richest household was usually that of the patriarch. Notably, the wealth inequality could be large within the extended family, whereby the patriarch carried a certain responsibility for the impoverished relatives. These were patron-client relationships where rich households offered protection and survival for the poorer members in exchange for labor services (usually involving the care of the livestock) (Boyanin et al., 2009: 15).

2.2 Soviet period: collectivization and the compression of inequality

The Kyrgyzs were largely indifferent to the 1917 Revolution. Yet, during the 1918-1920 Civil War period, fearing the expropriation by Bolsheviks, some of the rich tribal and clan leaders supported White Russian military groups. Upon victory in the Civil War, Bolsheviks tried to gain the trust of the poorer part of the local Kyrgyz population and launched several land redistribution reforms. These reforms that started in the early 1920s were initially very limited and had only mixed success, as they clashed with the deeply ingrained patron-client networks within the Kyrgyz clans.

The reforms of the late 1920s were much more aggressive and involved the collectivization of all the land and livestock. At the top of the Soviet Communist party apparatus, Stalin and his main supporters feared that the potential separatist movements in the Central Asian republics might lead to alliances of the "middle-class" indigenous population with Russian kulaks.² The aggressive party line was followed to the letter by the local party heads, who tried to eliminate this threat by implementing the collectivization in the harshest possible ways. Local party heads competed with each other to show maximum zeal in implementing the collectivization policy rapidly and to declare to the center the largest possible numbers of households whose livestock was expropriated and incorporated into kolkhozs. They targeted rich members of society, which led to the clan leaders and their households (about 500 households in Kyrgyzstan) being singled out for the confiscation of their wealth and for exile into Siberia and Ukraine. By 1935, 85% of the all the land suitable for agriculture in Kyrgyzstan was collectivized (Junushaliev 2003: 160). Sarsenbaev (2013) notes that this campaign was a preventive attack on the clan elites. It was driven by the belief that because manaps enjoyed the authority and the respect of the broad population, they could effectively hamper the implementation of the general collectivization drive. The clan structure received a further blow from the policy that explicitly forbade the formation of villages on the kinship basis during the transition from nomadic pastoralism to the sedentary life (Junushaliev 2003: 129).

An important feature of the collectivization in Central Asia was that, in contrast with Russian peasants, the poor strata of indigenous people were unconvinced by the benefits of collectivization. They saw this policy more as a threat to the well-established familiar patron-client clan and kinship system,

²Kulaks were wealthy Russian peasants who owned land and hired labour. In Russia, they resisted Stalin's collectivization; millions of them were arrested, exiled, or killed during the purges.

with clear personalized exchanges and obligations, and feared that collectivization and exile of the rich implied the loss of their powerful patrons, in exchange for an ill-defined “collective” (de facto, State) property of the livestock.

This set of policies was a huge shock to the economic system of Kyrgyzstan. The break-up of the social structure that the expropriation and the exile of the manaps, the managers of the traditional economic system, coupled with the poorly organized kolkhoz system and the generalized lack of trust of the population, led to a collapse in agricultural productivity and the famine in 1932-1933. This was aggravated by the in-migration of Kazakh families escaping an even more severe famine driven by the same factors. Yet, facing these massive social problems, the party rule only insisted in its ideological drive (local party members that refused to send grain to the center, hoping to limit the famine and to avoid an even worse catastrophe, were executed). The resulting impoverishment of the population implied that many peasants became day workers, which further decreased productivity. The aggregate amount of livestock in 1936 was barely a half of its 1928 level, the last year before the collectivization, and the situation in agriculture was similarly disastrous.³

Under the Soviet regime, Kyrgyzstan made substantial progress in terms of industrialization. However, most of its economy was still largely based on agricultural and natural resource extraction sectors. This, coupled with the general inefficiency of the Soviet economic system implied that the country remained economically marginal within the USSR (in 1979, Kyrgyzstan was the second-poorest republic in the Soviet Union (Anderson, 2013)).

Similar to the rest of the USSR, income and wealth inequality in Kyrgyzstan were highly compressed. In addition to collectivization, the state regulation of the labor markets guaranteed minimum income and employment. In the post-Stalin period, some policy changes in the agricultural sector led to a certain divergence of incomes, in particular, between kolkhozs (Khan and Ghai, 1979); however, these differences remained relatively minor, and within-kolkhoz differences in incomes and well-being levels remained strongly compressed.

During this period, the Soviet state apparatus conducted active policies against clan-based institutions. The clan identifiers (recorded by the pre-Soviet scholars and statisticians) were suppressed in the studies and data collected in the Soviet period (Junushaliev and Ploskikh, 2000). The fundamental role played by secular, centralized, and accessible formal education went together with the official line that pre-Soviet traditions were considered as backward. The Soviet ideological apparatus transformed Kyrgyz traditional milestone ceremonies (marriages, funerals), eliminating from them any clan-based elements. More generally, the popular culture of the Kyrgyz people was nurtured along the dominant State ideology whose objective was the leveling of national ethnic features and the creation of a new

³Several scholars have recently studied the consequences of these policies in neighbouring Kazakhstan (Pianciola, 2012; Cameron, 2018; Kindler, 2018). To the best of our knowledge, no similar effort exists for Kyrgyzstan, except efforts to compile oral histories of the period (see Kokaisl and Usmanov, 2012). These histories provide detailed descriptions of massive famine-induced deaths.

community of people along the Communist ideal. On surface, the majority of traditional social norms and structures was lost; however, in the years of post-Soviet transformation, many elements of this past cultural life re-emerged (Asankanov et al., 2017: 501) and there is some evidence that tribes and clans continued playing political roles throughout the period (we come back to this point in Section 6).

2.3 Kyrgyzstan after 1991: Independence, democratization, and development of the market economy

The break-up of the Soviet Union in 1991 triggered a deep economic crisis in all the ex-Soviet republics, and those at the periphery of the Union (including Kyrgyzstan) were particularly affected. Ex-state firms and their employees found themselves with virtually no effective demand for their goods (Blanchard and Kremer, 1997; Suesse, 2017). Most of these firms went bankrupt and lost most of their (often skilled) personnel. In Central Asian republics, many of these people reverted to small-scale “shuttle” trade (i.e. buying and re-selling consumer goods imported from China, Turkey, and Iran).

This crisis led to a sharp rise in poverty. Milanovic (1998) notes that the poverty headcount ratio in Kyrgyz Republic in 1993 stood at 86%, the highest among all the transition economies. The population massively relied on informal networks for mutual assistance in this period of hardship. Interestingly, Kuehnast and Dudwick (1996) find that during the transition period in Kyrgyzstan, the density and the type of social networks diverged: contrary to the the networks of the rich, those of the poor became less dense because they could not afford participating in network-building or network-maintaining events and gift-exchanges. Moreover, the nature of the social networks changed differentially. Among the non-poor, networks served ever more on economic interest (such as, for example, links serving to secure bank credit), whereas for the poor, they became less horizontal/egalitarian (as it was under the Soviet Union, with its *blat* system) and more of the patron-client nature, as the poor became more dependent on the assistance provided by their wealthier relatives and friends.

The political independence acquired in 1991 and the trajectory of democratic reforms that followed evolved along new dynamics. On the one hand, genuinely competitive elections emerged as the means of allocating political power and making collective political decisions. Other measures of democracy (freedom of speech, of the press, and of assembly) improved as well (Collins, 2002). On the other hand, the collapse of the Soviet state institutions at the local level, with the weakening State law enforcement and the emergence of organized crime, as in most ex-Soviet republics, led to rising violence in such vacuum of power. In addition, the de facto political and economic power allocation gradually became ever more personalized (Engvall, 2007). Political instability increased sharply: between 2005 and 2019, two presidents were ousted after violent protests, and another one was arrested on charges brought about by his successor.

At the parliamentary and local political level, several authors highlighted the key role that clans and tribes played as a basis for political entrepreneurship. Radnitz (2012) analyzes the instrumentalization of local (including, but not exclusively, clan- and tribe-based) networks by elites in organizing mass mobilization and protests, through what he calls “subversive clientelism”. Ismailbekova (2017) builds a detailed account of how both real and putative kinship ties are used and nurtured by local political entrepreneurs to construct patron-client relations that shape the economic and social life at the sub-national level. The main insight that emerges from these studies is that tribal and clan-based identity is a rich and malleable resource that can be skillfully exploited by political entrepreneurs in the contest for power.

3 Conceptual framework

The previous section highlights that the Soviet period was characterized by a massive expropriation of physical assets and a disruption in wealth accumulation in Kyrgyz society. Nevertheless (and despite the “modernization” campaigns), the tribal and clan-based institutions continued to play some role in the economic life of Kyrgyzs. Even though parents were no longer able to transmit to their offspring physical assets, they could and continued to transmit them intangible assets such as knowledge about tribal connections and history. The policies of the Soviet regime could not fully block such transmission. In this section, we present a simple conceptual framework that explores the mechanisms underlying the transmission of economic well-being across generations in Kyrgyz society and investigates how such mechanisms may change in the presence of an expropriative government policy.

3.1 Setup and intergenerational transmission of physical, human, and social capital

Consider a simple overlapping-generation model of consumption and investment, along the lines of Barro (1974) and Becker and Tomes (1979, 1986). Time evolves in discrete periods: $t = 0, 1, 2, \dots$. In each period, there are **families** composed of one individual who is young and one who is old. At the beginning of each period, each old individual gives birth to one offspring and decides on the allocation of resources. At the end of the period, old leave bequests and die. In addition, each family belongs to a **tribe** (τ).

Endowments. The endowments are stocks of three forms: physical capital (livestock), human capital (education), and social capital. This latter form of capital is the tribe’s network and connections, which we assume to be a local public good, common for all the members of the same tribe. Old individuals use their endowment to generate income from two sources, livestock production and wage, as described by the technologies below. Labor supply is inelastic and is equal to 1 for each individual.

Technologies. The production of livestock is described by a technology with a unique input, k_t , with diminishing marginal returns:

$$y_t = f(k_t), \text{ with } f' > 0 > f''.$$

Livestock capital depreciates at a constant rate of $\delta \in [0, 1)$. Hence the end-of-period value of capital (livestock) is

$$f(k_t) + (1 - \delta)k_t.$$

Human capital investments (by parents) and social capital investments (by all tribe members) positively affect the wage earned:

$$w_{t+1}^i = h \left(e_t^i, \sum_{j \in \tau} g_t^j \right),$$

and also exhibit diminishing marginal returns (to both types of investments):

$$h_1 > 0 > h_{11},$$

$$h_2 > 0 > h_{22}.$$

In each generation, (old) members decide on how to allocate the resource between consumption (c) and investment into the three forms of capital (s_t^i , e_t^i , and g_t^i , respectively) that determine the income of the next generation. Note that the investment in physical capital (livestock) is just a simple transfer of livestock to the next generation:

$$s_t^i = k_{t+1}^i.$$

Preferences. We assume filial altruism, such that an individual cares about his consumption and the future income of his child (as in conventionally assumed in the literature; see, for instance, Lambrecht et al., 2006), which is composed of the livestock production and labor income. For simplicity, let's assume that the utility is separable and each component is logarithmic:

$$U(c_t^i, d_{t+1}^i) = \ln c_t^i + \gamma \ln d_{t+1}^i,$$

where

$$d_{t+1}^i = f(k_{t+1}^i) + (1 - \delta)k_{t+1}^i + w_{t+1}^i.$$

Then, the optimization problem of an old individual living in period t becomes

$$\max_{c_t^i, s_t^i, e_t^i, g_t^i} \ln c_t^i + \gamma \ln d_{t+1}^i,$$

subject to the budget constraint

$$f(k_t^i) + (1 - \delta)k_t^i + w_t^i = c_t^i + s_t^i + e_t^i + g_t^i,$$

and where

$$d_{t+1}^i = f(k_{t+1}^i) + (1 - \delta)k_{t+1}^i + w_{t+1}^i = f(s_t^i) + (1 - \delta)s_t^i + h \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right).$$

The optimal individual behavior (see the Appendix for the derivation) yields the no-arbitrage condition between the three types of investment (in physical, human, and social capital):

$$f'(s_t^i) + 1 - \delta = h_1 \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right) = h_2 \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right).$$

Intuitively, the least-cost allocation of resources into investment for the offspring is such that marginal returns on a unit of resource invested is the same between the three forms of investment.

Consider now the individuals belonging to two tribes. Let tribe 1 be richer in livestock (i.e. having inherited a larger amount of livestock from their parents) than tribe 2. The private optimality conditions noted above imply that the generation- t members of tribe 1 invest more in all the three forms of capital for their offspring.

Proposition 1: Members of richer tribes invest more in physical, human, and social capital for their offspring. The income of this offspring, both capital and labor (wage), is higher than that of the offspring of members of the poorer tribes.

3.2 Intergenerational transmission with an expropriative government policy

Suppose now an (unanticipated) Bolshevik government decides to fully expropriate physical capital of one generation (those who come of age in period $t + 1$) and, moreover, puts the return to physical capital to zero (through collectivization). The government also redistributes the share $\theta \in [0, 1]$ of the expropriated capital as a lump-sum transfer to every individual. Notably, the government cannot fully expropriate the wages (though it can tax wages proportionally, at rate ϕ).

What would this imply for the optimization problem of the adults in generation $t + 1$? The problem

of an old individual living in period $t + 1$ becomes

$$\max_{c_{t+1}^i, s_{t+1}^i, e_{t+1}^i, g_{t+1}^i} \ln c_{t+1}^i + \gamma \ln d_{t+2}^i,$$

subject to the budget constraint

$$(1 - \phi)w_{t+1}^i + \theta K_{t+1} = c_{t+1}^i + s_{t+1}^i + e_{t+1}^i + g_{t+1}^i,$$

and where

$$d_{t+2}^i = (1 - \phi)w_{t+2}^i = (1 - \phi)h \left(e_{t+1}^i, g_{t+1}^i + \sum_{j \neq i} g_{t+1}^j \right).$$

Here, K_{t+1} is the total expropriated livestock, in per capita terms.

The optimal behavior under the expropriative policy (see the Appendix for the derivation) yields the following optimality conditions:

$$\left(\frac{1}{c_{t+1}^i} \right) \frac{h \left(e_{t+1}^i, g_{t+1}^i + \sum_{j \neq i} g_{t+1}^j \right)}{\gamma} = h_1 \left(e_{t+1}^i, g_{t+1}^i + \sum_{j \neq i} g_{t+1}^j \right) = h_2 \left(e_{t+1}^i, g_{t+1}^i + \sum_{j \neq i} g_{t+1}^j \right).$$

The generation- t adults put all the resources they decide to invest into their offspring's wage income sources (human capital, e_t^i , and social capital, g_t^i). However, even under Bolshevik collectivization, the descendants of tribes that were relatively richer in period t have more resources to invest in their children, because they have a higher after-tax wage income $(1 - \phi)w_{t+1}^i$, driven by the higher investment in human and social capital made, in turn, by their own parents. Hence, for the descendants of these tribes, the optimal human capital and social capital investment (respectively, e_{t+1}^i and g_{t+1}^i) would still be higher than for those of the descendants of the poorer tribes (the first argument in $h_1(\cdot)$, and the second argument in $h_2(\cdot)$ above take higher values for richer tribes, i.e. when c_{t+1}^i is larger). Consequently, the children of the former would have a relatively higher living standards because of their higher wage incomes $(1 - \phi)w_{t+2}^i$. This is *a fortiori* true if after the fall of Communism, the new government relaxes the taxation of labor income (reduces ϕ).⁴

Proposition 2: The descendants of tribes that were relatively richer in period t (before Communist era) invest more in human, and social capital for their offspring under Communism. The labor income of this offspring is higher than that of the offspring of members of the poorer tribes.

Several studies (for example, Bergson, 1984, and Gregory and Kohlhasse, 1988) provide evidence that

⁴More generally, this result holds even for non-linear progressive income taxation (i.e. individuals with higher wages facing higher marginal tax rates), as long as the after-tax and pre-tax wages remain positively correlated.

even the most drastic collectivization policies of the Bolshevik government were unable to fully expropriate the human and social capital embodied in labor incomes. This implies that even if Soviet citizens could not transmit physical capital to their offspring, the generation of parents coming of age under Communism invested the resources (left after their consumption) into other forms of capital, such as human and social capital, thereby maintaining partial persistence in income levels across generations.

An additional simple implication of our framework concerns the inequality within tribes. How would it evolve under the expropriative policies? The tribal social capital is a local public good; hence, by assumption, all the members of the same tribe enjoy its fruits equally. The expropriative policies eliminate the differences in physical capital. However, there remains the channel of human capital investment, which guarantees at least partial transmission of within-tribe inequality. To see this clearly, consider the following example of two tribes. Suppose in period t the first tribe has no inequality (in physical capital), whereas the second tribe is very heterogeneous (hierarchical) in physical capital. Despite the equalizing effect of the tribal social capital and expropriative policies in $t + 1$, the second tribe would - through the channel of human capital - still exhibit a larger dispersion of wage outcomes in $t + 2$ than the first tribe. Hence, across-tribe differences (for instance, the relative ranking of tribes) in within-tribe inequality persist and re-appear in the post-Soviet period.

3.3 Testable hypotheses

The main lesson from the simple model developed above is that, even if the government fully expropriates physical capital and taxes labor income, as long as after-tax wages are positively correlated with human and social capital, we should observe positive inter-generational correlations in the levels of (various dimensions of) capital, income, and consumption. This is because the inputs to the wage function are intangible and cannot be expropriated by the government.

To guide the formulation of testable hypotheses, let us briefly summarize the type of quantitative information we gathered for the pre-Soviet, Soviet and contemporaneous periods (we describe the data in detail in the next section). For the pre-Soviet period, we measure productive capital at the tribe level. For the Soviet period, we construct measures of human capital and proxies for wage income as well as a measure of social (or political) capital for each tribe. For the post-Soviet period, we observe levels of income, consumption, and human capital.

Given this set of variables, our model suggests the following inter-generational relationships:

H1: *Persistence in wealth rank over the century:* A tribe's productive capital in the pre-Soviet period is positively correlated with income, consumption and human capital levels of the post-Soviet generation.

H2: *Persistence of intra-tribe inequality:* Intra-tribe inequality in incomes/consumption levels of the current generation and in the wealth of the pre-Soviet generation are positively correlated.

H3. *Correlation between the pre-Soviet and Soviet period outcomes:* A tribe’s productive capital in the pre-Soviet period is positively correlated with the human and social capital of the Soviet generation.

4 Data

Our data sources can be divided into three groups: pre-Soviet data from Russian colonial expeditions of 1907-1913, the Soviet data (from ethnographic expeditions and administrative registries of elected politicians in the 1970s), and the post-Soviet household survey of 2010-2013 (“Life in Kyrgyzstan”). Below we provide the detailed description of each dataset, the matching challenges, and the procedure that we used in constructing our panel.

4.1 Pre-Soviet data

Our main sources of historical information concerning the tribes’ economic situation at the beginning of the 20th century are the materials of two Russian colonial expeditions, conducted between 1907 and 1913 in the territories that cover present-day Kyrgyzstan and Kazakhstan.⁵ These expeditions were organized and financed by the State Department of Land Use and Agriculture (GUZiZ), with the main objective of estimating the amount of land suitable for agriculture that could be made available for settlers from the European part of the Russian Empire.⁶

These materials (Rumyantsev, 1916a; Rumyantsev, 1916b; Skryplev, 1911; Skryplev, 1913a; Skryplev, 1913b; Skryplev, 1915) provide detailed information, at the level of extended families (small groups of about 10 kinship-related households that live and move together throughout the year) and communes (groups of extended families that jointly manage summer pasture land). They contain a large number of variables concerning the composition of families, their socio-economic well-being (in particular, livestock wealth), agricultural production, and participation in labor and product markets. Most importantly, they include information on kinship (sub-clan names) of each extended family, which allows us to identify the tribe to which each extended family belongs (see Section 4.4). Figure 1 shows the approximate location of the pastures of all the major Kyrgyz tribes in the early 20th century. One can clearly see that there are large areas where the pastures of several tribes overlap. In other words, there is no clearly marked geographic separation of tribes and a given tribe is typically present over several territories.

⁵For more information about the expedition materials, see Aldashev and Guirkinger (2012) and Guirkinger and Aldashev (2016).

⁶Central Asian historians agree on the reliability of the data collected by these expeditions. Shakhmatov (1964), Tolybekov (1971), Volkova (1982), and Masanov (2011) confirm that the expedition materials are in line with the qualitative and quantitative evidence on the principal socio-economic characteristics of nomadic population of the early 20th century, reported by other contemporaneous independent sources.

We focus on the data stemming from provinces (uezd) that are, at least in part, within the current borders of Kyrgyzstan. A large portion of these provinces correspond to present-day Kazakhstan and it is not surprising that many families belong to Kazakh instead of Kyrgyz tribes. After matching with Kyrgyz tribes' names we obtain a sample of 4702 extended families from 34 different tribes.⁷

On the basis of this data we construct measures of material well-being in the past at the tribe level. To this end, we rely on two main variables, available at the extended family level: livestock ownership per capita (expressed in adult horses equivalent) and cultivated land per capita (expressed in desyatina).⁸ As livestock rearing and farming were the two main sources of income in 1910, these variables capture the family's level of productive capital. We also build an index of wealth for each extended family, by aggregating the two types of capital after normalizing (by subtracting the sample average and dividing by the sample standard deviation). Averaging over extended families of each tribe yields a measure of tribe's wealth, expressed as a z-score. The first panel of Table 1 provides descriptive statistics for these measures, aggregated at the tribe level.

4.2 Soviet data

We rely on two main sources from the soviet period. The first are the materials of an ethnographic expedition, well-known for the care in their construction and the scholarly reputation of its team. The second are the administrative data on biographies of members of the parliament (MPs), intended mostly for the internal use of the Communist party.

Materials of the ethnographic expedition of 1953-1955

In 1953-55, an ethnographic expedition headed by prominent Soviet orientalists, Prof. Saul Abramzon, and Dr. Yakov Vinnikov (respectively, for Northern and Southern Kyrgyzstan) studied the tribal composition of Kyrgyzstan, using a carefully constructed combination of historical materials and first-hand collection of qualitative data from several hundred elderly respondents with a good knowledge of tribal history of various parts of the country. The materials of this expeditions were published in 1956-1960 (Vinnikov, 1956; Abramzon, 1960). They consist of the detailed history of each of forty major Kyrgyz tribes, their genealogical trees (divisions into clans and sub-clans), as well as the information about the geographic location of people belonging to all the clans of each tribe around 1950.⁹

⁷The total number of extended families recorded in the provinces that cover present-day Kyrgyzstan (as well as the southern part of Kazakhstan) is 8638.

⁸One desyatina is equivalent to 1.093 hectare.

⁹The key motivation behind this study was to close the existing gaps in the history of ethnogenesis of Kyrgyz people, which, given that the Soviet principle of national self-determination, had important political implications. Despite the well-established quality of the work by this expedition, in 1970s, one of its leaders (S. Abramzon) was accused by the Kyrgyz republican Communist Party leadership of excessively underlining the importance of the tribal-clanic elements in the contemporary life of Kyrgyz people, as well as of publishing a work that goes against the unity of Kyrgyz nation.

We use this data in two ways. First, we rely on the genealogical trees of this expedition to match the clans (both in the pre-Soviet and post-Soviet data) to tribes, as explained below. Second, using this data, we associate each village reported in this expedition the tribes occupying it, which later allows us to associate Kyrgyz politicians of the 1970s to tribes.

Biographies of MPs of Kyrgyz SSR, 1972-1976

The main source of power in the Soviet Republics lied with the Central Committee of the Republican branch of the Communist Party (appointed by the USSR Central Committee). However, considerable privileges (although limited political power) were given to the Supreme Soviet (the Republican Parliament), whose 340 members were elected. From 1960s until 1991, after each election of the Supreme Soviet, the Soviet government printed a short biography of all elected members. Starting in 1972, these biographies contain detailed information on the place of birth of elected officials. We use data from 1972 and 1976 (the two volumes containing information on the place of birth that we could easily get access to). There are a total of 360 members elected either in 1972 or in 1976 who are ethnic Kyrgyzs (the other members are from other ethnic - mostly Russian - origins). Matching this data with the tribe composition of villages (from the Abramzon and Vinnikov expeditions in 1950s), we attribute to each member of Kyrgyz origin his/her tribe (if there are several tribes present at the location, we weight the probability of belonging to each of these tribes with the population share of the tribes at this location.¹⁰ This data thus enables us to investigate whether the level of political representation of each tribe is positively correlated to the tribe's wealth in 1910.

4.3 Post-Soviet data (“Life in Kyrgyzstan”)

Our source for the current-day economic outcomes is the “Life in Kyrgyzstan” (hereafter, LiK) dataset. The project of building this dataset included several institutions in Central Asia and Europe with the German Institute for Economic Research (DIW Berlin) as the consortium leader. It is a research-oriented, open access, multi-topic longitudinal survey of households and individuals. LiK is nationally representative (in covers all the 7 oblasts and 2 main cities in Kyrgyzstan). The study has been conducted in five waves (2010, 2011, 2012, 2013, and 2016). A total of about 2800 households and 8000 individuals are included in the survey. About two-thirds of respondents are ethnic Kyrgyzs, 12% are ethnic Uzbeks, and the rest is a combination of Russians, Kazakhs, Ukrainians, etc.

This data includes information about household demographics, assets, expenditure, migration, employment, agricultural markets, shocks, social networks, subjective well-being. Some topics are addressed only in selected waves. The 2012 wave is of special interest to us, because it contains a section on custom and traditions, with questions about the tribal/clanic belonging of the household head.

¹⁰For 15 members, we are unable to identify their villages of origin on the maps.

This data allows to construct measures of per capita income and consumption at the household level. To reduce the noise that might arise because of short-run fluctuations in income or expenditure, we take the averages across three years centered in 2012 (2011, 2012, and 2013).¹¹ We also build normalized measures of income and expenditure (z-score) by subtracting the corresponding sample average and dividing by the standard deviation.

The dataset also contains measures of asset ownership and human capital. For asset ownership, we use the variables on land ownership (any land owned, land area owned per capita, and irrigated land owned per capita). We also build a composite asset that aggregates all household assets recorded in the survey using principal component analysis.¹² For measures of human capital, we rely on the years of education completed, height, body mass index (BMI), and the birthweight of the first-born (for women respondents aged 25 or above).

In addition, the data contains information on key outcomes for the parents of respondents. This allows us to go back one generation and to construct measures of human capital and proxies for wage income during the Soviet period. Specifically, we know the education of fathers of men, their occupation (skilled/non-skilled), and the sector of their occupation (agricultural/non-agricultural). The first variable is a measure of human capital while the two others are indicators of the level of wage income. Unskilled and agricultural occupation were associated with a lower wage level than skilled and non-agricultural occupation (Gregory and Kohlhase, 1988). Finally we also build a variable to capture whether they belong to the top quintile in terms of the prestige of their occupation (again a proxy for wage income).¹³ We focus on the fathers of male respondents, as tribal identity is transmitted from fathers to sons (given that the survey recorded the tribe of household heads - overwhelmingly men - only the tribe of the fathers of male respondents is known).

The last three panels of Table 1 present descriptive statistics for the variables constructed on the basis of the LiK data. The third panel reports the variables constructed at the household level for the 1344 households included in the analysis (as detailed in Section 4.4 below, we only include households who declared a clan / tribe). The fourth panel includes variables available at the individual level (for members of the surveyed households). For human capital indicators, we restrict attention to individuals above 23 because individuals have (in most cases) achieved their education at that age. Recalling that the tribal identity is reported only for male respondents, we focus on males for education and height

¹¹We do not include the 2010 wave in the computation of average income and average expenditure because the questions related to income were different in that wave, making the income measure less comparable to the other waves. We do not include the 2016 wave either because we would lose many observations due to attrition (given the 3-year interruption in the survey).

¹²The asset categories include properties, vehicles, domestic appliances, furniture, media appliances, communication devices, livestock and housing characteristics. For each item, the survey recorded whether the household owned it. We build an index using the first principal component, separately for urban and rural households.

¹³To build this variable we classify the position of the father in terms of its prestige in the socio-economic ranking of the soviet period. The categories included are “legislator, senior official, manager, profession and technician”. One fifth of fathers occupied such a position, and therefore belong to the top quintile in terms of the prestige of their occupation.

levels. Indeed these outcomes are largely driven by parental investment and, due to a relatively well-respected tribal exogamy rules, women are likely to have grown up in a tribe different from that of their husbands. We include women in the BMI analysis, as the body mass depends on the current level of nutrition. Birthweight was recorded for each child born to a female member of the surveyed household.¹⁴ The last panel features the variables capturing the human capital and proxies of wage income of the father of male respondents.

4.4 Matching across datasets

The tribe is the smallest level of aggregation (or the “lowest common denominator”) common between historical and contemporaneous data. Both the historical expeditions data and *Life in Kyrgyzstan* survey (its 2012 wave) contain information on clan belonging (respectively, of the extended family and the household head). However, given the flexible use of genealogical terminology in everyday language, the clan or tribe belonging is reported at different levels. As mentioned above, the tribal-clanic structure is hierarchical: the Kyrgyz people is divided into three wings (level 1) that are further divided into about 35 tribes (level 2), which are in turn further split into clans (level 3) and sub-clans (level 4).

Most respondents of the LiK provided information at the tribe level (level 2), with a smaller share reporting their clans (level 3). In the historical expeditions data, extended families reported mostly the lower-level information (level 3 or 4), i.e. the clan names, with no information on the tribal belonging. Consequently, we need to aggregate the 1910 clan-level information to tribes, to match them with the 2012 data. The primary source of information to match the clans with tribes is the aforementioned 1953-55 expedition materials (Abramzon, 1960; Vinnikov, 1956). Further details of the matching procedure are provided in the Appendix.

Overall, the historical expeditions data include 8636 extended families. The clan belonging of about 90% of extended families was recorded by the expedition interviewers. Of these, we were able to match 64% to a Kyrgyz tribe (5001 families). The cases or non-matching are largely explained by the presence of ethnic Kazakh in the data (who do not belong to a Kyrgyz tribe). In fact two large provinces (Aulieatinsk and Pishpek) covered the territory of both current-day Southern Kazakhstan and current-day Northern Kyrgyzstan. Once we restrict our analysis to districts (volosts) that lie strictly within the borders of the current-day Kyrgyzstan, we are able to match the clan names of 96% of extended families to one of the Kyrgyz tribes.

For the LiK dataset, 80% of ethnic Kyrgyz respondents reported a tribe or a clan name. We were able to match 91% of them to one of the Kyrgyz tribes (level 2). The remaining 9% are either cases where the corresponding name of the clan was not found in the Abramzon expedition materials, or when the

¹⁴We focus on the birth weight of first-born children to avoid birth order effects.

clan name is not unique (it may refer to clans of different tribes). Our main sample thus corresponds to 1344 households belonging to one of the main 34 Kyrgyz tribes.

5 Persistence of material well-being over the long 20th century

5.1 Pre-Soviet tribal wealth and post-Soviet individual/household outcomes

Empirical strategy

To investigate the link between the post-Soviet economic outcomes (at the individual or household level) and the average pre-Soviet wealth of the tribe (from which the individual descends), we run simple linear regressions where the dependent variable is an individual (or household) outcome obtained from the LiK survey and the tribe-level wealth measures in the 1910s serve as explanatory variables. We thus estimate the following model (where the variable Y_{itg} is the outcome of interest for individual i , belonging to tribe t and living in area g , the vector X_i includes individual characteristics (such as age) and X_t the tribe characteristics in the past):

$$Y_{itg} = \alpha' X_i + \beta' X_t + \varepsilon_{itg} \quad (1)$$

To account for the fact that tribes have different sizes (see Section 3) and that averages (included in X_t) are computed over different numbers of extended families for different tribes, we weigh the observations by the population size of the tribe in the past. Standard errors are systematically clustered at the tribe level.

A natural channel that could explain the persistence of tribe’s material well-being is geography. If regions differ in their natural endowments (climate, land productivity, connectedness to other regions, etc.) and migration over the 20th century was relatively limited, then households living in 2012 in the better-endowed regions have better economic opportunities, which would also hold for their ancestors.¹⁵ Under this scenario, the correlation in material well-being between 1910 and 2012 would require no mechanism of inter-generational transmission and rely uniquely on the region of residence. To control for this channel of persistence, we include neighbourhood fixed effects (γ_g) in the above model:

$$Y_{itg} = \alpha' X_i + \beta' X_t + \gamma_g + \varepsilon_{it} \quad (2)$$

This is our preferred specification. It allows to mute the geographic channel of persistence, given that the identification of the coefficients β is based on the comparison of individuals living in the same

¹⁵This reasoning also assumes that the structural change of the economy has not radically altered the ranking of regions in terms of the “natural” advantages they offer.

geographic area (neighborhood) but belonging to different tribes. There are 108 neighborhoods in the 2012 sample. They correspond to a village in rural areas and to a town quarter in urban areas.¹⁶

As measures of pre-Soviet tribal wealth, we use the variables introduced in Section 4.1. These are per capita area cultivated (either in desyatinas¹⁷ or normalized in z-scores), per capita livestock (either in adult horse equivalent or normalized), and a composite index that averages per capita area cultivated and per capita livestock, both expressed as z-scores. With these indicators of past wealth, we test the three hypotheses derived from our model. First, we estimate persistence in indicators of material well-being: income, expenditure, asset ownership, and measures of human capital in 2011-13. Second, we investigate the correlation between pre-Soviet and post-Soviet intra-tribe inequality. Third, we go back one generation and estimate whether the respondent's parents fared better (under the Soviet system) if they belonged to a wealthier tribe in the pre-Soviet period. As measures of parental outcomes, we rely on years of education and the type of occupation. The descriptive statistics for all the variables used in the analysis are provided in Table 1.

Household consumption, income, assets, and human capital in 2011-13 and tribes' pre-Soviet wealth (testing H1)

Tables 2 and 3 present the results of the estimations of equations (1) and (2), respectively, with household income and expenditures as dependent variables. Each table includes three panels corresponding to different measures of pre-Soviet tribe wealth. In both tables the first two columns report the estimated effect of past tribe wealth on normalized income and expenditure while the last two columns use income and expenditure expressed in the local currency (Kyrgyz mos). Table 2 suggests that there is a remarkable persistence in average levels of material well-being over the 20th century and Table 3 reveals that this persistence cannot be explained by tribes' geographic endowment factors alone: while coefficients are smaller once we include neighborhood fixed effects, they largely remain statistically significant and economically important. For example, the results reported in column 1, panel 1 of Table 3 indicate that one additional standard deviation of tribe wealth in the past is associated with an additional 0.195 standard deviations of income today. Area cultivated and livestock holding in 1910 do not have the same influence on current day outcomes: the second and third panel of Table 3 indicate that only the area cultivated has a statistically significant effect on both present-day income and expenditure. In the rest of the paper, we present only estimations including neighborhood fixed effects.

The estimated correlation between the present-day income and the pre-Soviet tribe wealth is substantial, as compared to the persistence rates in the existing literature. The two data points are distant

¹⁶These neighborhoods are the primary sampling units from which the 2010 LiK sample was drawn. The average number of tribes represented in the same neighborhood is 3.8, corresponding on average to 13 households. Single-tribe neighbourhoods are less than one-fifth of the sample (20 out of 108).

¹⁷One desyatina is equivalent to 1.09 hectares.

by 3.3 generations (using the conventional 30-year span for one generation). The correlation of 0.195 between the pre-Soviet tribe wealth and the current income implies a persistence rate of 0.61 between generations.¹⁸ In the societies studied by Clark and his co-authors using surnames, the estimated persistence rate in social status across generations is higher than in our case (between 0.7 and 0.9; see Clark, 2014). However, in the rest of the literature, persistence rates are much lower and vary strongly over space and time (Solon, 2018). For example, using surnames data from the United States, Chetty et al. (2014) find a persistence rate of about 0.4. Our estimated degree of persistence in tribes' relative well-being is therefore surprisingly large, especially given the political and economic turmoils experienced by Kyrgyz people over the 20th century.

Table 4 reproduces the analysis using indicators of asset holdings as dependent variables. In the first column, the dependent variable is an index of durable assets ownership, based on the principal component analysis (including all durables recorded in the survey and the characteristics of the dwelling). Columns (2) to (4) focus on land ownership. In column (2) the dependent variable is a binary variable indicating whether the household owns any land (80% of the sampled households report to own some land). In column (3) the dependent variable is land owned per capita (in hectares) and in column (4) irrigated land owned per capita. Asset ownership is positively correlated with tribe wealth in the past even if the estimated coefficient is statistically significant only for the past wealth index (column 1, panel 1). In contrast, land ownership is negatively correlated with tribe wealth in 1910: members of tribes who cultivated larger areas in the past own less land today. We come back to this result in Section 6 below.

Table 5 reports the results for human capital indicators in 2012. Measures of human capital include years of education, height, body mass index (BMI), and birthweight of first-born children. Recalling that the tribal identity is reported only for male respondents, we focus on males for education and height levels. These outcomes are largely driven by parental investment and, due to a relatively well-respected tribal exogamy rules, women are likely to have grown up in a tribe different from that of their husbands. We include women in the BMI regression, as the body mass depends on the current level of nutrition. Birthweight was recorded for each child born to a female member of the surveyed household. To avoid problems related to endogenous birth-order effects, we focus on the birth weight of the first-born children only. Past tribe wealth (of the husband's tribe) appears strongly positively correlated with the BMI and birthweight, but less so with education and height. In the education regressions (column 1), the coefficients on variables capturing past tribe wealth are small and statistically insignificant. Male heights (column 2) appears positively correlated with land ownership, but negatively correlated with livestock ownership in the past (although the coefficient is significant only when we use the

¹⁸We obtain this persistence rate by assuming a simple AR(1) model for the correlation between adjacent generations and solve for x in the following expression: $0.195 = x^3$.³³ We thereby can abstract from the fact that we have two different measures of material well-being at the two points in time (wealth for 1910 and income for 2012), implicitly assuming that the distributions of wealth and income in 1910 are similar.

normalized measure of livestock). In contrast, the reported coefficients for body mass index (column 3) and birthweight (column 4) are statistically and economically significant. For instance, one standard deviation increase in tribe wealth in 1910 translates into an additional 120 g in newborn weight in the present (column 4, first panel). In short, we find mixed evidence regarding the correlation of human capital investments in the post-Soviet period and tribes' wealth in the past: it is positive and significant for some indicators, but less so for others. We discuss potential explanations for these mixed results in the next section.

Correlation between intra-tribe levels of inequality in the pre-Soviet and the post-Soviet periods (testing H2)

The analysis above shows that several individual outcomes in 2012 are correlated with tribes' average wealth in 1910. This implies some persistence in the relative ranking of tribes over the period. The granularity of the data allows us to go beyond these averages and investigate the persistence of inequality *within* tribes.

Figure 2 presents the distribution (kernel density) of cultivated area per capita in 1910, for each of the five largest tribes. The profile of these distributions are quite different across tribes, in particular in terms of the width and height of the bell curve, suggesting that tribes experienced different level of inequality across extended families. A visual comparison of Figure 2 with the distributions of household expenditure per capita in 2011-13 (Figure 4) suggests that in 2010s tribes also exhibit different distributions; moreover, the same tribes have the flatter distributions in the past and in the present. The comparison of the distribution of livestock per capita in the past and that of income in the present (Figures 3 and 5) is less straightforward, in part because the distributions are less concentrated (and the vertical scales are very different).

To quantitatively compare the levels of inequality in the pre- and post-Soviet period across tribes, we construct pseudo-Kuznets ratios for area and livestock per capita in 1910 and income and expenditure in 2011-13. For each variable, we divide the average measure in the top quintile of the distribution by the average in the bottom two quintiles.¹⁹ Figure 6 plots the obtained measures for livestock per capita in 1910 and expenditure per capita in 2011-13. Each dot corresponds to a tribe; the size of the dot is proportional to the population size of the tribe in 1910. The figure suggests a positive correlation between these inequality measures. Tribes in which the top quintile owned - on average - less than three times the average livestock of the bottom two quintiles (pseudo-Kuznets ratio below three) in 1910s have a pseudo-Kuznets ratio below three in expenditure per capita in 2011-13. In contrast, the highest level of inequality today (pseudo-Kuznets ratio above 3) are present in tribes that also experienced

¹⁹We consider the distribution across *individuals* of the same tribes. We attribute to each member of the extended family (household) the average per capita measure of the extended family (household).

relatively high inequality in the past (pseudo-Kuznets ratio above 3). While the measures obtained in the past and in the present are of remarkably similar magnitude, they are based on variables measured at different levels of aggregation: in 1910 data, the most disaggregated information is available at the extended family level (composed of 10 households, on average), while in 2011-13, our measures are based on household-level information. This implies that the level of inequality is underestimated for the historical data.²⁰ Figures 7 to 9 reproduce the same plot for the other measures of inequality. Table 6 presents the matrix of correlation coefficients across the various measures of inequality for the 34 tribes (observations are weighted by the size of the tribe). The correlation coefficients between past and present measures are large - between 0.34 and 0.63, depending on the measure used - and are mostly significant (except for the correlation between the pseudo-Kuznets ratios for land and for expenditures).

In short, in addition to persistence in average tribe well-being over the 20th century, we find substantial persistence in the levels of intra-tribe inequality.

5.2 Going back one generation: Soviet period outcomes and pre-Soviet wealth (testing H3)

Human capital and labour income in the Soviet period versus tribes' pre-Soviet wealth

The 2012 survey includes information on the parents of respondents, which allows us to investigate whether pre-Soviet tribe wealth correlates with individual outcomes for the *parental* generation. As most of these parents grew up under the Soviet regime, this data offers a unique opportunity to compare tribes in a period where the government policy was actively directed against tribal and clan-based identity (see Section 2.2). As tribal identity is recorded only for fathers of male respondents (because of the exogamy rule), we restrict the sample of parents to these fathers. We rely again on the strategy described by Equation (2), and use the available indicators of fathers' relative position in society. The survey recorded the year of birth of parents, as well as their education level, type and sector of occupation, and the highest position they held in their last job. We thus build variables capturing the fathers' years of education, whether they worked in an unskilled job, whether they specialized in agriculture, and whether they were in the top quintile in terms of the prestige of their position in their last job (the variable labeled "good position"). It is useful to remember that agriculture was generally considered as a sector with a low social prestige during the Soviet period (Rutland, 1993).

²⁰To be precise, inequality is somewhat underestimated for the present-day data as well, because we use household averages. The underestimation problem is more severe for the 1910 data, given that we ignore the inequality *across* households of the *same* extended family. Using data from Kazakhstan, Aldashev and Guirkinger (2017) show that this bias may be substantial: extended families group households with widely different standards of living, with the richest members acting as patrons for impoverished households.

Results are presented in Table 7 and in Table 8. The latter table further restricts the sample to fathers born before 1965 and therefore undoubtedly entered their professional life during the Soviet period. The results on education in Table 7 are similar to those obtained above: the coefficients on past tribe wealth are small and insignificant, suggesting no correlation between pre-Soviet tribe wealth and Soviet-period years of education. This is less true for older fathers, however (Table 8): while still statistically insignificant, the coefficient is large and positive (in the first panel, for example, it suggest that one additional standard deviation in past tribe wealth is associated with one additional year of education). Regarding occupation, descendants of pre-Soviet wealthier tribes are significantly less likely to have an unskilled job or to be employed in agriculture. For example, column (2) of Table 7 suggests that an additional standard deviation in pre-Soviet tribe wealth is associated with a decrease of 11 percentage points in the probability of being in an unskilled occupation, for fathers of respondents. These effects are even stronger for older fathers (a 21 percentage point lower probability, in Table 8). As for the top of the distribution of occupational status (columns (4)), it is positively correlated with pre-Soviet tribal wealth, but the coefficient is statistically insignificant even for older fathers. In short, even during the Soviet period, the relative social position held by individuals seems to correlate positively with the pre-Soviet wealth of tribes from which they descend (at least as measured by the type of occupation (skilled / unskilled) and the sector of activity).

Social capital in the Soviet period versus pre-Soviet wealth

Data on politicians elected into the Supreme Soviet (the Republican Parliament) of Kyrgyz SSR in the 1970s enable us to test for a correlation between the Kyrgyz tribes' levels of social/political capital in the 1970s and the pre-Soviet wealth of tribes.

To measure the level of social/political capital of a tribe, we rely on a measure of its representation among the political elite. Specifically, we compute the proportion of elected members of the Supreme Soviet belonging to a each tribe: $SharePolElite_t = \frac{N_{elite_t}}{\sum_k N_{elite_k}}$ where N_{elite_t} is the number of members of the political elite belonging to tribe t . We then explore whether tribes that were richer in the pre-Soviet period were over-represented among the political elite, controlling for the share of the tribe in the general population, $ShareTribe_t = \frac{N_t}{\sum_k N_k}$ (with N_t the size of tribe t).

We thus run simple linear regressions at the tribe level, with $SharePolElite_t$ as the dependent variable:

$$SharePolElite_t = \alpha' X_t + \beta' ShareTribe_t + \varepsilon_t$$

The vector X includes measures of pre-Soviet wealth at the tribe level (either expressed in levels or in z-scores). We weigh the observations by the pre-Soviet population size of the tribe.

Results are reported in Table 9. The parameter estimates on the pre-Soviet wealth measures indicate that the 1970s’ political representation of a Kyrgyz tribe is positively correlated with the tribe’s pre-Soviet wealth, even after controlling for the population share of the tribe. The correlation is statistically significant when the wealth is measured as an index (column 1) or in levels of land and livestock (column 3). In terms of the size of the effect, one standard deviation increase in the wealth index of a tribe in 1910 is associated with an increase of 3.7 percentage points in the proportion of the political elite belonging to that tribe in 1970s (based on estimates in column 1). This result is consistent with our Hypothesis 3: tribes that were richer in the pre-Soviet period have invested more in tribal social/political capital and were over-represented among the political elite in the Soviet times.

6 Discussion

As noted in the introduction, a large literature in economics has documented persistence in relative economic outcomes over a long period of time. The main driver of this persistence in this literature is wealth transmission from parents to their children: richer parents leave larger bequests to their children, who in turn transmit wealth to their own children. Hence, unsurprisingly, in the contexts of the countries studied in the previous literature, richer families at the start of the 20th century are expected to fare better a century later. What makes our study particularly interesting is that the wealth inheritance channel was *de facto* shut down by Soviet economic and social policies. We have argued that, in line with our theoretical framework, Kyrgyz families transmitted other forms of capital, such as human or social/political and our empirical results are largely consistent with this argument. We now discuss the relevance of each form of capital (and its transmission) in the historical context, on the basis of historical evidence.

6.1 Transmission of material assets

As discussed in Section 2.2, during the 20th century, Kyrgyzstan, just like all the Soviet republics, went through deep structural changes. Aggressive redistributive policies targeted the wealthy households; virtually all the land and livestock were collectivized. The traditional nomadic-pastoralist system was undermined and replaced by an agricultural sector based on collective ownership of both land and livestock with very little private property and little heterogeneity between peasants within the collective farms (kolkhozs). The transmission of material assets through inheritance was extremely limited, not so much because inheritance was forbidden but because “the preponderant public ownership of the means of production considerably constrained the accumulation of private wealth” (Bergson, 1984).

After the fall of the USSR, collective farms were largely privatized and one may wonder whether the descendants of the landowners of the 1920s have been favored in the process. Even if it is impossible

de jure (because all kolkhoz members had the same rights to the land), in practice, observers of the privatization process report considerable departures from the rule of equal division of the kolkhoz land among its members, with local leaders using their power to divert the process towards their private interests (Petric et al., 2004).²¹ This would suggest an alternative mechanism for the observed correlation between pre-Soviet tribe-level material wealth and the economic outcomes in 2012: if members of wealthier tribes in 1910 were more likely to occupy positions of local power (such as the heads of kolkhozs) at the moment of the dissolution of the USSR, they may have been favored in the privatization process, giving them a headstart in the new market economy.

However, other elements suggest that the persistence in relative well-being driven *mainly* by an unequal access to land during the privatization process is a very unlikely scenario. First, already during the Soviet period, members of the once-wealthier tribes were more likely to leave the kolkhozs and work in non-agricultural sectors (see Section 5.2). Second, as we have shown above, income and consumption in 2012 are *negatively* correlated with land ownership: tribes who had more land in 1910 hold less land today. Given the extreme thinness of the agricultural land market since privatization (Steiman, 2010), we can safely assume that tribes who owned more land in 1910 owned less land immediately after privatization. In short, the persistence we document above cannot be explained simply by the transmission of material assets from parents to children over the 20th century.

6.2 Transmission of intangible assets: human capital

Barring material wealth transmission, a natural candidate to explain persistence of material well-being is the transmission of other (intangible) assets which are conducive to income generation. The existence of an inter-generational transmission of education levels in the Soviet Union has been documented by many scholars (see Bergson, 1984, for a review): children of university graduates were far more likely to attend a university than children of manual workers. Yet, we find little evidence that members of wealthier tribes in 1910 acquired a higher level of education: the level of education of fathers of respondents who grew up during the Soviet period is not significantly correlated with the tribe wealth in the past (Tables 7 and 8, column 1), and neither is the level of education of male respondents themselves (Table 4, column 1). This may be because the education levels in Kyrgyzstan remain overall modest (less than 10% of fathers of respondents had a post-secondary education), or because our sample size is too small to detect an effect that would concern a minority part of the overall population.

Besides formal education, families may also transmit cultural traits, some of which might facilitate economic success under the market system (for example, values of entrepreneurship). Our data does

²¹Kolkhozs usually were not homogeneous in terms of their tribal composition, especially after the restructuring and merging of small kolkhozs into larger units during the Khrushchev era).

not allow to directly trace the persistence of cultural traits. However, a necessary condition for this explanation to hold is that tribes exhibit sufficiently marked differences in cultural traits. This condition can be tested using the 2012 wave of LiK that includes some information on respondents’ cultural traits and values, in particular regarding family. To compare cultural traits across tribes, we run simple regressions with tribe and neighborhood fixed effects: $Y_{itg} = \gamma_t + \gamma_g + \varepsilon_i$. The predicted values on the tribe indicator variables ($\hat{\gamma}_t$) correspond to the average of the dependent variable for each tribe t , controlling for neighborhood effects.²² We perform this analysis for three dependent variables related to marriage and family outcomes. The first is the so-called “bride capture”. Every married woman was asked about the form of her marriage arrangement (i.e. whether it was a love marriage, arranged by both families, or whether she was a “captured” bride). Bride capture consists in kidnapping a future bride and celebrating a marriage shortly after the capture. It is a widely diffused phenomenon in the current-day Kyrgyzstan: 21% of women in our sample declare to have been “captured” brides. Anthropologists point to an increase in the phenomenon after the fall of the Soviet Union and women defense groups have mobilized against this practice that effectively push women into undesired marriages (see, for instance, Werner, 2009). The second outcome we consider is the openness of respondents to accept a son-in-law or a daughter-in-law from another ethnic background (non-Kyrgyz). This question was asked to all respondents. The third outcome relates to co-residence pattern. It is a binary variable indicating whether the respondent household is vertically extended, in the sense that parents live with one or several married children.

Figures 10, 11, 12 below present graphically our regression results. Each dot corresponds to a different tribe and indicates the average predicted value of the outcome considered, controlling for neighborhood fixed effects. The figures indicate that there is substantial heterogeneity in the tribe average values for these measures. For example, while the prevalence of bride capture is 10% or lower in four tribes, it reaches levels above 30% in five other tribes. Regarding openness to accept a son-in-law or a daughter-in-law from another ethnic group, the distribution of tribal averages is less spread, but there still are statistically significant differences between tribes. Finally, the co-residence patterns widely differ by tribes: in some tribes, multi-generational co-residence is considered as exceptional, whereas in others more than 75% of households are vertically extended. In short, tribes differ significantly in some key cultural traits. While this is not *per se* a mechanism that explains the persistence in relative levels of material well-being we have documented earlier, it nevertheless suggests that tribes have (and possibly transmit) highly specific cultural traits.

6.3 Transmission of intangible assets: social / political capital

A mechanism related to (but distinct from) the transmission of human capital is based on social networks. If the allocation of scarce resources (for example, prestigious positions or jobs) relies on clan-

²²Standard errors are clustered at the tribe level.

based networks, then tribes and clans who initially held powerful positions in the Soviet administration may have endowed their next-generation members with better economic and social opportunities. Then, even in the absence of inter-generational transmission of wealth or human capital, we might observe a persistence in levels of relative prosperity over several generations. The services that clan networks provide to their members have been extensively studied by economic historians in the context of China (see Greif and Tabellini, 2017, and references therein). These services include, among other things, preferential access to jobs or positions of power.²³

Historians and political scientists provide qualitative evidence that in Kyrgyzstan clan and tribe networks were important in the political elite sphere during the colonial and Soviet era, and that in the post-Soviet period, both local politics and business activities heavily relied on clan solidarity and loyalty norms. During the Russian imperial period, the tribal and clan-based structures were deliberately used as a base on which to construct colonial power, by integrating the elites of the lineages into the colonial leadership system and by rewarding these elites with special privileges (Ohayon, 2016). In contrast, after the 1917 Revolution, the Soviet regime claimed to replace the “backward” clan-based system with a “modern nation”. Yet, in practice, the first political leaders of the Soviet regimes in Central Asia were from the indigenous intelligentsia composed of tribe leaders and their descendants (Asankanov et al. 2017: 494-495). This state of affairs was later heavily criticized by the center. Ohayon (2016) cites a key statement made at the 4th Plenary Congress of the Kyrgyz Regional Committee of the Communist party that illustrates this point: *“Lineage relations, and the struggle between the remnants of lineage and group relations, continue to be questions of the utmost importance for us in Kyrgyzia. The struggle of lineages and groups is today the main weapon of the class enemy, the weapon of the bay [i.e. the rich] and the manap [i.e. the clan leaders] that makes it possible for them to influence the kolkhozes as well as the local Soviet apparatus from within, and in this way to elude and to corrupt the class line.”* Despite the official “modernist” policies that targeted tribal and clan-based structures, the local power apparatus continued to be deeply intertwined with lineage-based structures of power and the center often used lineage networks to help implementing its policies locally.²⁴ Ohayon (2016) concludes her analysis of the role of clans and tribes in politics in the 1920s and 1930s as follows: *“Despite purges and other phenomena that weakened the political resources of the lineages, it appears that the political duplicity that emerged through the meeting between two forms of power and loyalty lastingly structured local power in the Kyrgyz Soviet Republic, sometimes working to thwart the Soviet state’s ideal and project, and sometimes ensuring its implementation.”* In other words, even when politicians were chosen appointed by the top for their loyalty to the regime, to rule locally these

²³Campbell and Lee (2011) argue that clan networks enabled powerful clans to maintain a continuous presence among the bureaucratic elite during the imperial era, despite a highly competitive selection process of these elites through provincial and national exams. At each generation, clan leaders selected the most able potential candidates among families of the clan and all families of the clan pooled resources to pay for the best preparation to the exams (see also Clark, 2014).

²⁴For example, when trying to deport the kulaks, Stalin’s secret police could not rely on the local knowledge of members of the same lineage of the wealthy kulaks, they extracted information from the rival lineages (Ohayon, 2016).

politicians had to play along clannish and tribal lines. Similarly, Junushaliev (2003) provides ample evidence for the use of clan- and tribal relations for the occupation of key political positions in the 1920s and 1930s.

After the fall of the USSR and the introduction of democratic elections in Kyrgyzstan, tribal or clan-based loyalties appear to resume their key role in politics. Several scholars have underlined how powerful politicians skillfully exploit clan identities to win votes (Collins, 2002; Schatz, 2004). Yet, others scholars suggest that such structures play a relatively minor role in national politics, but may nevertheless be mobilized in the context of local elections (Gulette, 2006; Jacquesson, 2012). Jacquesson (2012) provides examples where the instrumentalization of clan identity by contenders of local elections in rural areas led to unprecedented antagonism between clans.²⁵

Local businessmen who thrive in the new market economy may also rely on lineage networks to develop their economic activities. Ismailbekova (2017) provides a detailed account of the career of a successful entrepreneur who built his enterprise by mobilizing loyal clan members. She argues that patron-client relationships link the entrepreneur with his “aides” - a relationship characterized by trust, exchange, and mutual benefit (with the patron benefiting relatively more from this relationship). Ismailbekova describes the embeddedness of these relationships in old clannish logic (sometimes subtly reinterpreted to the benefit of the protagonists). Her case study illustrates the fundamental complementarity between the economic and political spheres: the local entrepreneur consolidated his economic success by winning local elections and embarking on a national political career.

In short, scholarly qualitative accounts of the roles of clans and tribes during and after the Soviet period suggest a strong continuity in the embeddedness of local politics in clan and tribe networks. This contributed to explaining the persistence that we observe in the relative performance of tribes in the economic sphere. Even if the Soviet regime managed to considerably compress wealth inequality, tribes that were economically advantaged in 1910 captured a disproportionate share of the elite positions of the new Soviet regime. If these elites were in a better position to thrive in the new market economy, their tribes (already relatively wealthier in 1910s) may be performing better economically also in the 2010s.

7 Conclusion

We have studied the persistence of economic outcomes between and within units of the traditional social structure (tribes) over a long 20th century in a context where the government conducted a multitude of aggressive egalitarian and anti-traditional economic and cultural policies. Our main finding is the

²⁵We use here the term clan in a generic way. Jacquesson (2012) underlines that the relevant social group is highly context specific. In some areas, political contests oppose two clans of the same tribe, while in others, the contest is clearly between tribes.

robust correlation in tribe-level economic outcomes, between 1910s and 2010s, even after controlling for unobservable local geographic effects. The economic outcomes of individuals living in the same district (geographic cluster) but belonging to different (paternal) tribes is positively correlated with the material well-being of their tribes in pre-Soviet times. Furthermore, we find that the degree of economic inequality among tribe members today correlates with the within-tribe wealth inequality in the early 20th century.

Next, we have investigated the potential channels driving this surprising persistence. Using additional data from the Soviet period, we find support for the inter-generational transmission of human capital, relative status, political power, and cultural traits, even when expropriative policies blocked the transmission of material wealth.

Our findings have important implications for the key policy debate in economics concerning the effectiveness of public policies in reducing inequality and enhancing social mobility. Although recent studies (e.g. Jakobsen et al., 2020) find that the elasticity of taxable wealth with respect to the net-of-tax return is large (at the top of the wealth distribution), our work argues that wealth taxation - even in its extreme form - is ineffective in reverting the fortunes within a society, because the groups that are ranked higher in terms of their pre-policy wealth adjust by shifting their effort to other non-taxable channels of inter-generational transmission of well-being and status. Thus, our findings lend support to the Pareto's Law mentioned in the introduction. Of course, a key question for future work is whether the same patterns hold in other societies that have implemented massive wealth taxation but whose social structure is less reliant on tribal and clan-based identity (e.g. Russia).

Our study also contributes to the understanding the role of traditional institutions on the economic behavior and outcomes in developing countries today. Our results imply that such institutions are extremely resilient: their influence resists some of the most radical economic and cultural public policies ever undertaken. Finally, our work relates to the small and growing literature in development economics on group inequality that mostly focuses on large groups (ethnicity, race, etc.) and inter-group inequality. Here, we are able to go at the finer level of sub-ethnic groups (tribes and clans). This refinement is important, because in a society where people strongly identify with tribes, clans, and other sub-ethnic groups, the emergence and rise of inter-clan inequality in economic outcomes potentially creates fertile ground for internal rivalry and conflicts, including the instrumentalization of such identities by political parties. Such instrumentalization clearly is a major factor that can destabilize the society. We hope that our study opens new avenues for analyzing these and related phenomena.

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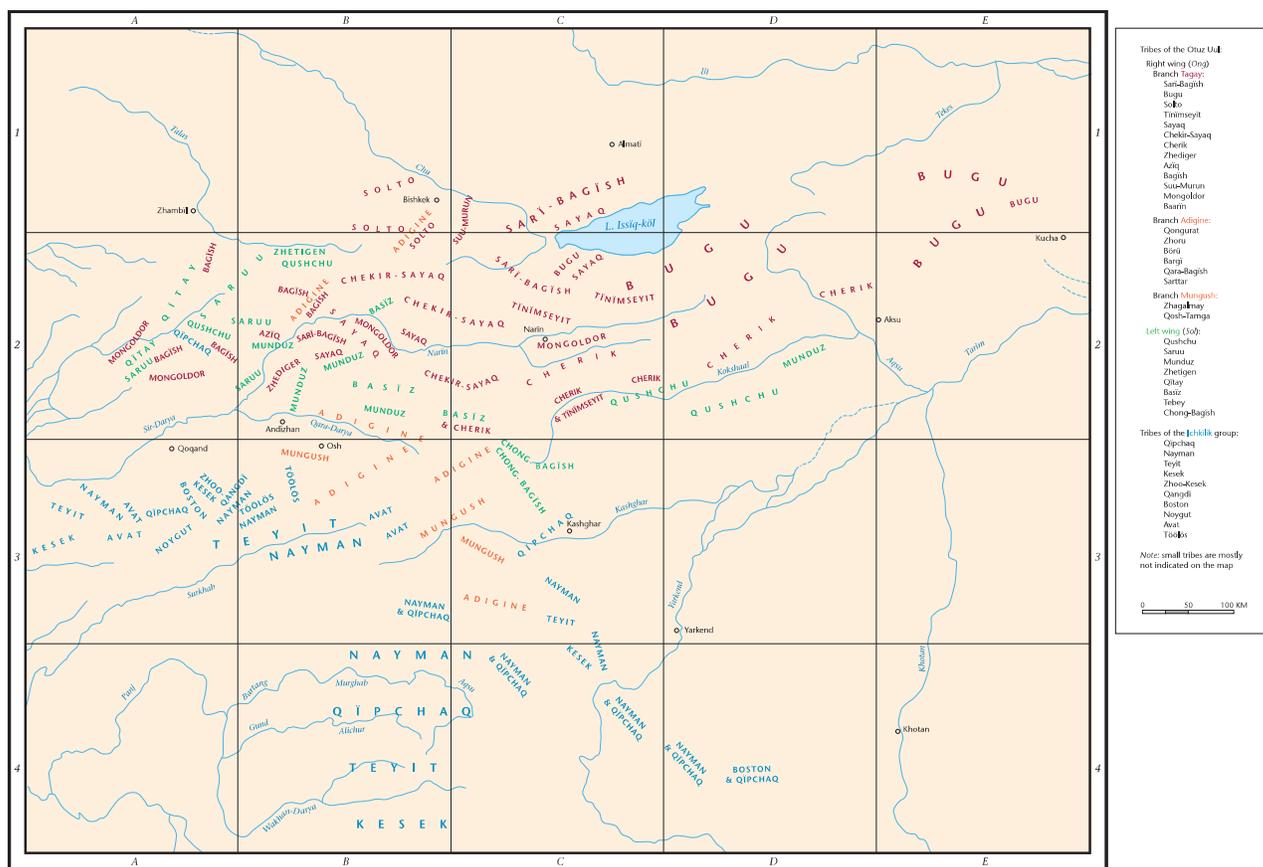
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Figures and Tables

Figure 1: Map of tribes' location



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39. THE QIRGHIZ TRIBES IN THE 20TH CENTURY

Figure 2: Distribution of cultivated area per capita by tribe in 1910 (kernel density)

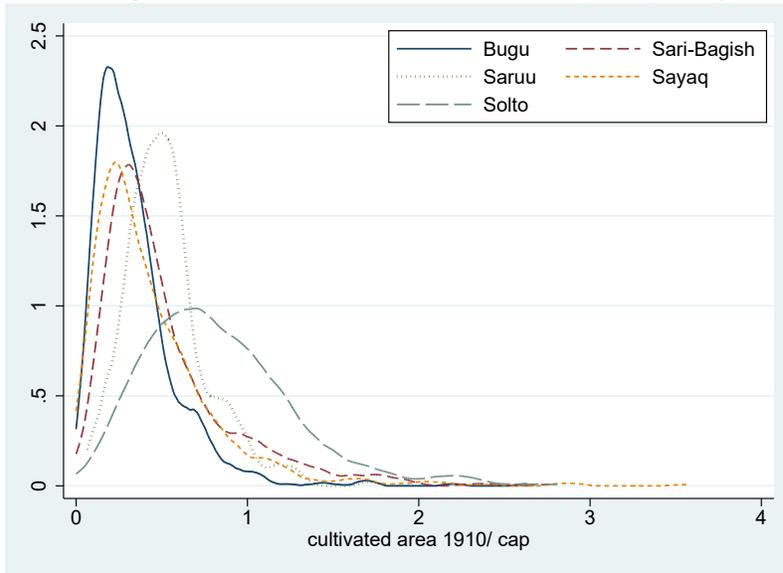


Figure 3: Distribution of livestock per capita by tribe in 1910 (kernel density)

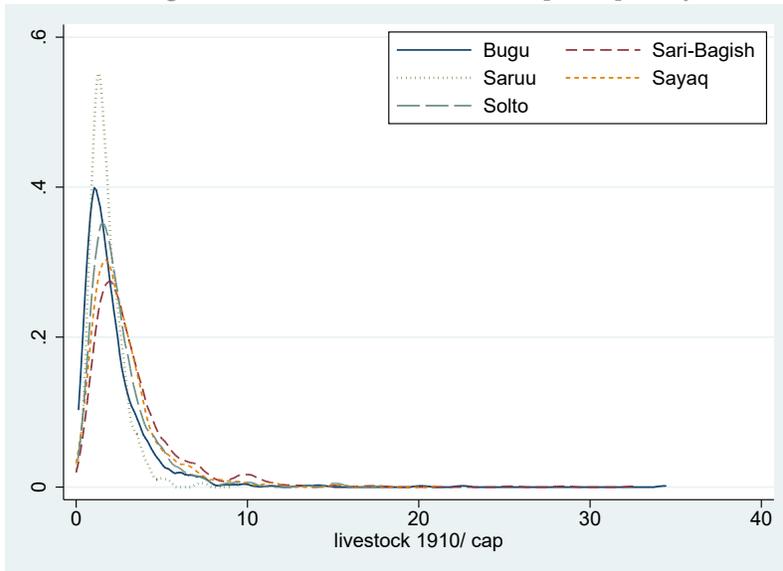


Figure 4: Distribution of total expenditures per capita by tribe in 2011-13 (kernel density)

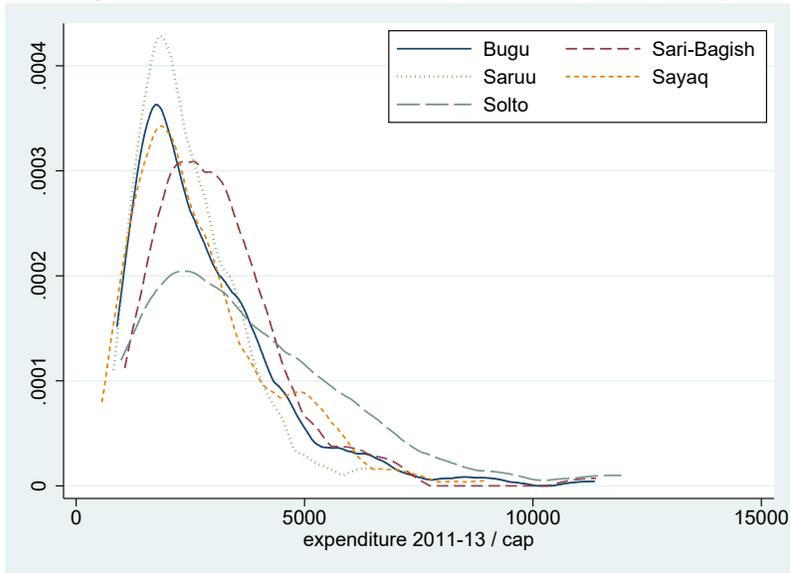


Figure 5: Distribution of income per capita by tribe in 2011-13 (kernel density)

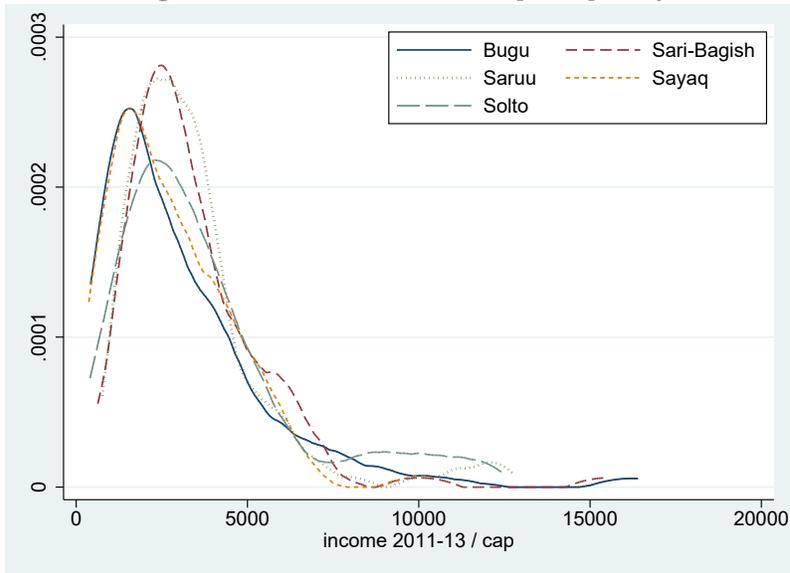


Figure 6: Pseudo-Kuznets ratios for expenditures 2011-13 and for livestock in 1910 (dot proportional to tribe size)

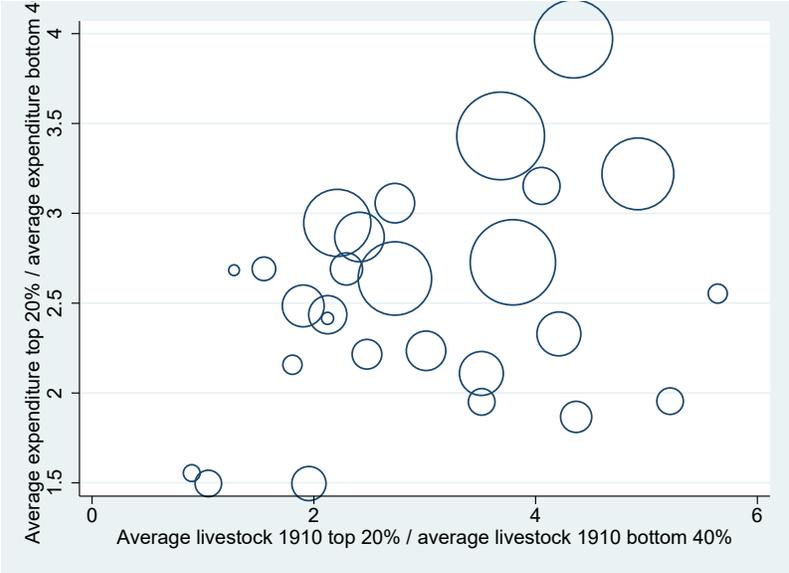


Figure 7: Plot of pseudo-Kuznets ratios for expenditure 2011-13 and for cultivated area in 1910 (dot proportional to tribe size)

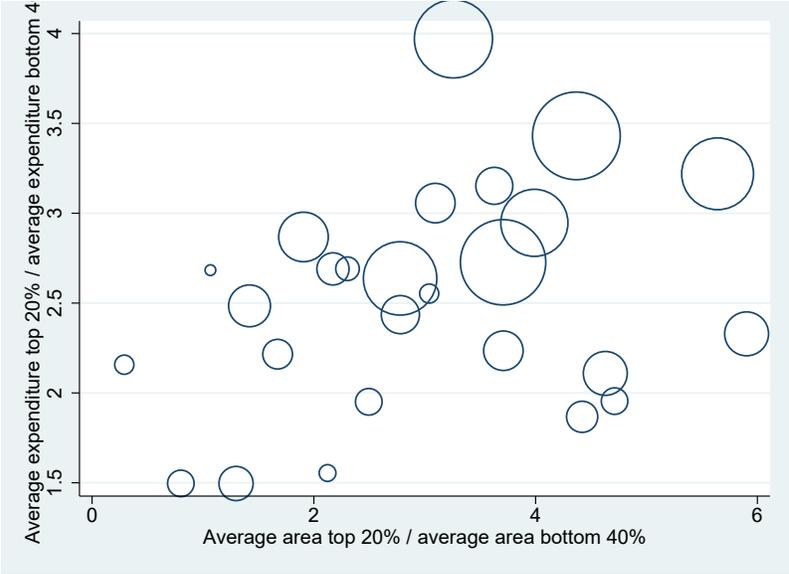


Figure 8: Plot of pseudo-Kuznets ratios for income 2011-13 and for livestock in 1910 (dot proportional to tribe size)

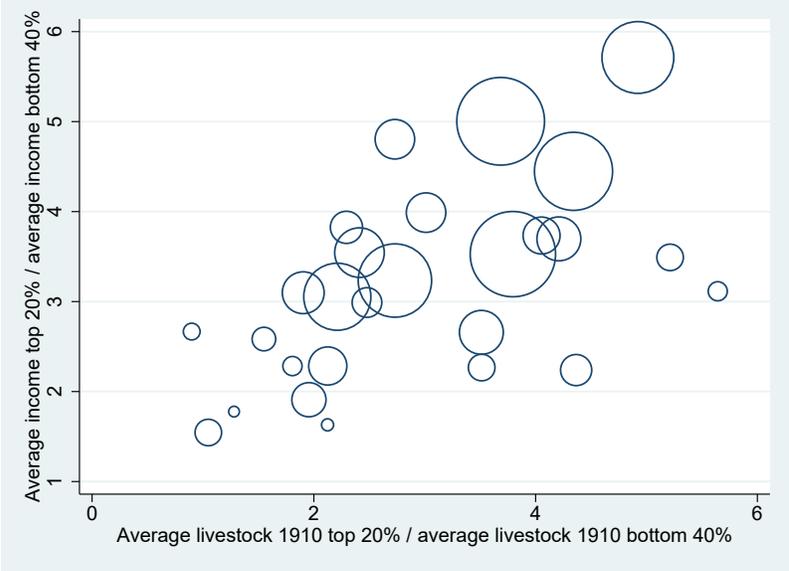


Figure 9: Plot of pseudo-Kuznets ratios for income 2011-13 and for area in 1910 (dot proportional to tribe size)

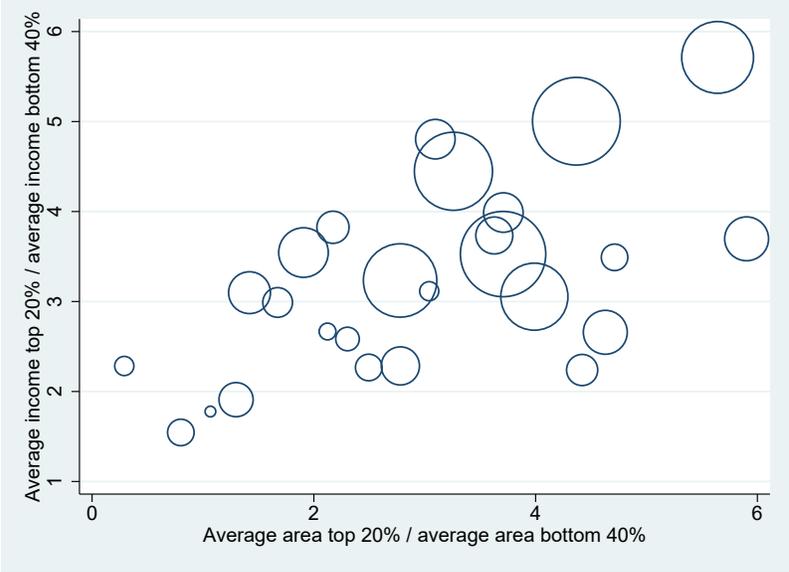


Figure 10: Differences across tribes in prevalence of bride capture: predicted tribe average with 95% confidence interval (controlling for neighborhood)

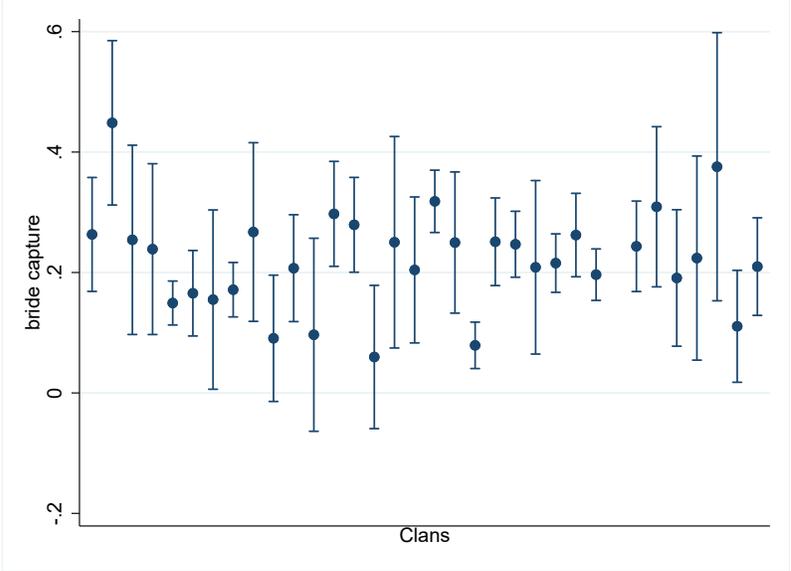


Figure 11: Differences across tribes in openness to accepting a daughter-in-law or a son-in-law from another ethnic group: predicted tribe average with 95% confidence interval (controlling for neighborhood)

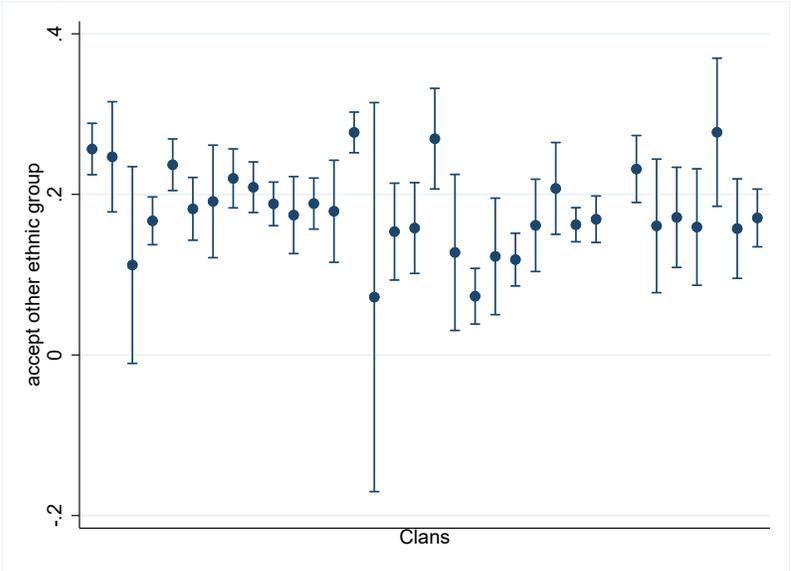


Figure 12: Differences across tribes in co-residence between parents and married children: predicted tribe average with 95% confidence interval (controlling for neighborhood)

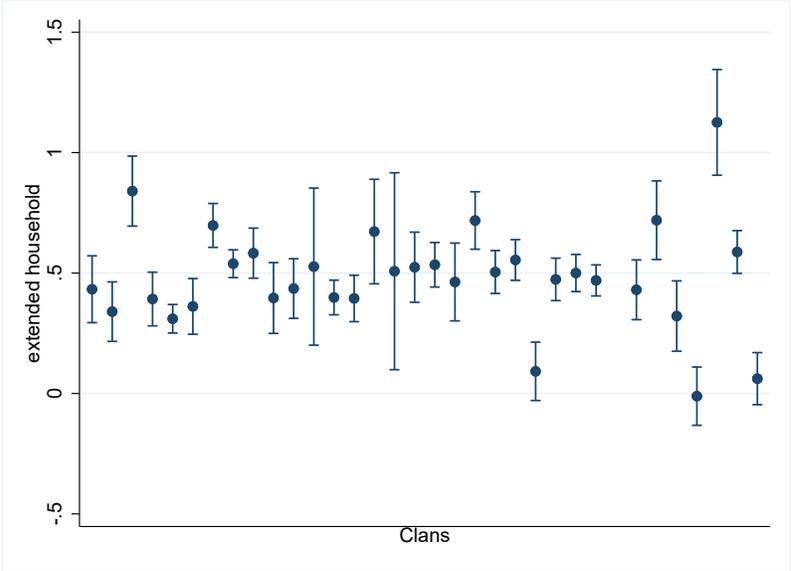


Table 1: Descriptive statistics

	count	mean	s.d.	min	max
Historical data (1910)					
tribe wealth (z_score)	34	0.019	0.30	-0.46	0.99
tribe land / cap (z_score)	34	0.11	0.63	-1.11	2.68
tribe livestock / cap (z_score)	34	-0.072	0.48	-0.76	1.57
tribe land / cap (desyatinas)	34	0.54	0.23	0.067	1.50
tribe livestock / cap (horse equivalent)	34	2.28	0.95	1.13	5.35
number of extended families in tribe	34	143	214	1	745
size of tribe (# members)	34	11436	13483	91	48757
share of tribe in population	34	0.03	0.03	0.00	0.12
Deputy data (1972 and 1976)					
share of tribe in elected deputies	33	0.03	0.03	0.00	0.14
Household level data (2012)					
income / cap (2011-13)*	1324	3152.9	2472.0	316.8	47318.5
expenditure / cap (2011-13)*	1344	2665.4	1520.4	248.0	14012.4
asset index	1343	-0.061	2.34	-5.00	12.5
any land owned	1344	0.79	0.41	0	1
land area / cap	1344	0.21	0.46	0	8.20
irrigated land area / cap	1344	0.18	0.39	0	5.80
age hh head	1344	51.7	13.7	18	94
Individual level data (2012)					
years of education (men>23)	1590	11.1	2.24	0	17
height (men>23)	1555	172.2	6.05	149	192
body mass index (bmi) (>23)	3253	24.6	3.13	11.7	44.1
1st born birthweight (women>23)	1459	3.14	0.42	1.40	5.20
fertility (# birth) (women>40)	1013	3.75	2.07	0	10
Fathers of men past outcomes					
father's education (years)	1143	8.31	4.42	0	16.7
father in unskilled occupation	1079	0.53	0.50	0	1
father in agriculture	1106	0.68	0.47	0	1
father had a good position	1079	0.12	0.33	0	1

* Expenditure and income are in per capita term and expressed in 2010 Soms (adjusting for inflation using local consumer price indexes)

Table 2: Average household income and expenditure (per capita) in 2011-13 as a function of past tribe wealth

	(1)	(2)	(3)	(4)
	z-score inc	z-score exp	income	expenditure
	2011-13	2011-13	2011-13	2011-13
tribe wealth 1910 (z_score)	0.291**	0.563*	705.100**	893.636*
	(0.137)	(0.309)	(330.582)	(490.433)
<i>N</i>	1324	1343	1324	1343
tribe land / cap 1910 (z_score)	0.246***	0.296	594.337***	469.985
	(0.057)	(0.209)	(139.121)	(331.041)
tribe livestock / cap 1910 (z_score)	-0.086	0.247	-209.165	392.603
	(0.147)	(0.184)	(355.030)	(292.670)
<i>N</i>	1324	1343	1324	1343
tribe land / cap 1910 (desyatinas)	0.694***	0.772*	1679.961***	1224.683*
	(0.185)	(0.456)	(446.923)	(723.149)
tribe livestock / cap 1910 (horses)	-0.066	0.259***	-159.528	410.489***
	(0.079)	(0.092)	(191.313)	(146.432)
<i>N</i>	1324	1343	1324	1343

Each horizontal panel (and column) reports separate linear regressions.

Weights = # extended families in 1910.

Clustered robust standard errors in parentheses (at tribe level).

Controls include the household head age and its square.

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

Table 3: Average household income and expenditure (per capita) in 2011-13 as a function of past tribe wealth, with neighborhood fixed effects

	(1)	(2)	(3)	(4)
	z-score inc	z-score exp	income	expenditure
	2011-13	2011-13	2011-13	2011-13
tribe wealth 1910 (z_score)	0.195**	0.171***	472.277**	271.062***
	(0.076)	(0.049)	(184.157)	(78.103)
<i>N</i>	1324	1343	1324	1343
tribe land / cap 1910 (z_score)	0.105**	0.127***	253.914**	200.978***
	(0.040)	(0.026)	(97.030)	(41.722)
tribe livestock / cap 1910 (z_score)	0.078	-0.025	189.301	-39.259
	(0.128)	(0.108)	(310.340)	(171.669)
<i>N</i>	1324	1343	1324	1343
tribe land / cap 1910 (desyatinas)	0.316***	0.324***	764.137***	513.542***
	(0.114)	(0.078)	(276.457)	(124.096)
tribe livestock / cap 1910 (horses)	0.014	-0.007	34.765	-10.676
	(0.065)	(0.044)	(158.400)	(69.877)
<i>N</i>	1324	1343	1324	1343

Each horizontal panel (and column) reports separate linear regressions.

Weights = # extended families in 1910.

Clustered robust standard errors in parentheses (at tribe level).

Fixed effects at the neighborhood level (2010 sampling unit).

Controls include the household head age and its square.

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

Table 4: Household assets in 2012 as a function of past tribe wealth, with neighbourhood fixed effects

	(1)	(2)	(3)	(4)
	asset index	any land owned	land area per capita	irrig. land area per capita
tribe wealth 1910 (z_score)	0.348*	-0.028	-0.090**	-0.095**
	(0.193)	(0.051)	(0.042)	(0.038)
<i>N</i>	1343	1343	1343	1343
tribe land / cap 1910 (z_score)	0.200	0.017	-0.047*	-0.053**
	(0.160)	(0.015)	(0.024)	(0.022)
tribe livestock / cap 1910 (z_score)	0.104	-0.096**	-0.040	-0.032
	(0.210)	(0.043)	(0.030)	(0.029)
<i>N</i>	1343	1343	1343	1343
tribe land / cap 1910 (desyatinas)	0.648	0.037	-0.117*	-0.140**
	(0.469)	(0.061)	(0.069)	(0.065)
tribe livestock / cap 1910 (horses)	-0.011	-0.045	-0.041**	-0.028
	(0.149)	(0.029)	(0.019)	(0.020)
<i>N</i>	1343	1343	1343	1343

Each horizontal panel (and column) reports separate linear regressions.

Weights = # extended families in 1910.

Clustered robust standard errors in parentheses (at tribe level).

Fixed effects at the 2010 sampling unit level.

Controls include the household head age and its square.

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

Table 5: Human capital and fertility as a function of past tribe wealth, with neighborhood fixed effects

	(1)	(2)	(3)	(4)
	education	height	BMI	1st born
	(years)			birthweight
	men>23	men>23	women & men>23	women>25
tribe wealth 1910 (z_score)	0.070	0.739	0.930***	0.118***
	(0.449)	(1.231)	(0.256)	(0.036)
<i>N</i>	1595	1560	3253	1459
tribe land / cap 1910 (z_score)	-0.065	1.131**	0.515***	0.049***
	(0.205)	(0.497)	(0.147)	(0.015)
tribe livestock / cap 1910 (z_score)	0.438	-2.405**	0.321	0.090***
	(0.379)	(1.024)	(0.306)	(0.028)
<i>N</i>	1590	1555	3253	1459
tribe land / cap 1910 (desyatinas)	0.013	3.092**	1.323***	0.136**
	(0.502)	(1.477)	(0.396)	(0.061)
tribe livestock / cap 1910 (horses)	0.154	-0.882	0.005	0.026
	(0.265)	(0.537)	(0.199)	(0.025)
<i>N</i>	1590	1555	3253	1459

Each horizontal panel (and column) reports separate linear regressions.

Weights = # extended families in 1910. Clustered robust standard errors in parentheses (at tribe level).

Fixed effects at the 2010 sampling unit level. Controls include individual age and its square.

Each observation is an individual.

We focus on men for education and height because they are determined by investments made by parents (due to the exogamy rule, only the tribe of men's parents can be inferred).

Fertility questions were answered by women. To focus on completed fertility, we consider women above 40.

For birthweight of first-born we include women above 26. At 26, 80% of women respondents report to have at least one child.

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

Table 6: Correlation between measures of tribe inequality in the past and in the present

	Pseudo-Kuznets ratios (average for top 20% / average for bottom 40%)			
	expenditure 2011-13	income 2011-13	land 1910	livestock 1910
expenditure 2011-13	1.00			
income 2011-13	0.79***	1.00		
land 1910	0.34	0.55**	1.00	
livestock 1910	0.52**	0.63***	0.74***	1.00

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Tribes are weighted by their size in 1910.

Table 7: Father's education and occupation as a function of past tribe wealth, with neighborhood fixed effects

	(1)	(2)	(3)	(4)
	men's father's education (years)	men's father's in unskilled occupation	men's father's in agriculture	men's father's held a good position
tribe wealth 1910 (z_score)	-0.16 (0.44)	-0.11* (0.06)	-0.18* (0.10)	0.10 (0.08)
<i>N</i>	1143	1079	1106	1079
tribe land / cap 1910 (z_score)	0.09 (0.20)	-0.04 (0.03)	-0.08 (0.05)	0.09* (0.05)
tribe livestock / cap 1910 (z_score)	-0.54 (0.64)	-0.10 (0.06)	-0.10 (0.10)	-0.04 (0.07)
<i>N</i>	1143	1079	1106	1079
tribe land / cap 1910 (desyatinas)	-0.07 (0.39)	-0.07 (0.05)	-0.10** (0.04)	0.03 (0.04)
tribe livestock / cap 1910 (horses)	0.19 (0.54)	-0.09 (0.08)	-0.15 (0.14)	0.20 (0.12)
<i>N</i>	1143	1079	1106	1079

Each horizontal panel (and column) reports separate linear regressions.

Weights = # extended families in 1910.

Clustered robust standard errors in parentheses (at tribe level).

Fixed effects at the 2010 sampling unit level. Controls include the age the father would have and its square.

Each observation is an individual.

We focus on men's fathers because due to exogamy, only tribe of men's father can be inferred.

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

Table 8: Father's education and occupation as a function of past tribe wealth (men born before 1965), with neighborhood fixed effects

	(1)	(2)	(3)	(4)
	men's father's education (years)	men's father's in unskilled occupation	men's father's in agriculture	men's father's held a good position
tribe wealth 1910 (z_score)	0.95 (1.07)	-0.21* (0.11)	-0.56** (0.24)	0.07 (0.07)
<i>N</i>	556	528	539	528
tribe land / cap 1910 (z_score)	-0.01 (0.39)	-0.05 (0.08)	-0.33*** (0.10)	0.01 (0.04)
tribe livestock / cap 1910 (z_score)	1.89 (1.33)	-0.22*** (0.07)	-0.15 (0.20)	0.11 (0.09)
<i>N</i>	556	528	539	528
tribe land / cap 1910 (desyatinas)	0.82 (0.72)	-0.15** (0.07)	-0.11 (0.10)	0.11** (0.04)
tribe livestock / cap 1910 (horses)	-0.22 (1.30)	-0.03 (0.24)	-0.73** (0.28)	-0.03 (0.11)
<i>N</i>	556	528	539	528

Each horizontal panel (and column) reports separate linear regressions.

Weights = # extended families in 1910.

Clustered robust standard errors in parentheses (at tribe level).

Fixed effects at the 2010 sampling unit level. Controls include the age the father would have and its square.

Each observation is an individual.

We focus on men's fathers because due to exogamy, only tribe of men's father can be inferred.

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

Table 9: Correlation between the relative representation of the tribes among the political elite and measures of wealth in 1910

	(1)	(2)	(3)
	sh elite from tribe	sh elite from tribe	sh elite from tribe
share tribe in pop 1910	0.850*** (0.099)	0.848*** (0.105)	0.802*** (0.095)
tribe wealth 1910 (z_score)	0.037* (0.019)		
tribe land / cap 1910 (z_score)		0.018 (0.011)	
tribe livestock / cap 1910 (z_score)		0.019 (0.015)	
tribe land / cap 1910 (desyatenas)			0.063** (0.026)
tribe livestock / cap 1910 (horses)			0.018** (0.007)
constant	0.005 (0.008)	0.005 (0.009)	-0.066*** (0.023)
<i>N</i>	33	33	33

Standard errors in parentheses

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

Appendix

Deriving the optimal allocations

The Lagrangian of the optimization program in the absence of government policy is

$$L = \ln c_t^i + \gamma \ln \left(f(s_t^i) + (1 - \delta)s_t^i + h \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right) \right) + \lambda [f(k_t^i) + (1 - \delta)k_t^i + w_t^i - c_t^i - s_t^i - e_t^i - g_t^i].$$

The corresponding first-order conditions are

$$\begin{aligned} \frac{\partial L}{\partial c_t^i} &= \frac{1}{c_t^i} - \lambda = 0 \\ \frac{\partial L}{\partial s_t^i} &= \frac{\gamma[f'(s_t^i) + 1 - \delta]}{f(s_t^i) + (1 - \delta)s_t^i + h \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right)} - \lambda = 0 \\ \frac{\partial L}{\partial e_t^i} &= \frac{\gamma h_1 \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right)}{f(s_t^i) + (1 - \delta)s_t^i + h \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right)} - \lambda = 0 \\ \frac{\partial L}{\partial g_t^i} &= \frac{\gamma h_2 \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right)}{f(s_t^i) + (1 - \delta)s_t^i + h \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right)} - \lambda = 0 \\ \frac{\partial L}{\partial \lambda} &= f(k_t^i) + (1 - \delta)k_t^i + w_t^i - c_t^i - s_t^i - e_t^i - g_t^i = 0 \end{aligned}$$

Combining the first two conditions, we get the standard consumption-saving tradeoff:

$$\frac{1}{c_t^i} = \frac{\gamma[f'(s_t^i) + 1 - \delta]}{f(s_t^i) + (1 - \delta)s_t^i + h \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right)}.$$

At the optimum, the marginal benefit of consuming a unit equals to its marginal cost (one unit less of capital transferred to the offspring implies the net loss of $(f'(s_t^i) + 1 - \delta)$ times the forgone utility of the offspring, weighted by γ).

Combining the second, third, and fourth conditions, we obtain the no-arbitrage condition between the three types of investment (in physical, human, and social capital):

$$f'(s_t^i) + 1 - \delta = h_1 \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right) = h_2 \left(e_t^i, g_t^i + \sum_{j \neq i} g_t^j \right).$$

The Lagrangian of the optimization program in the presence of the expropriative government policy is

$$\begin{aligned} L = & \ln c_{t+1}^i + \gamma \ln \left((1 - \phi) h \left(e_{t+1}^i, g_{t+1}^i + \sum_{j \neq i} g_{t+1}^j \right) \right) + \\ & + \lambda [(1 - \phi) w_{t+1}^i + \theta K_{t+1} - c_{t+1}^i - s_{t+1}^i - e_{t+1}^i - g_{t+1}^i]. \end{aligned}$$

Obviously, $s_{t+1}^i = 0$ (no investment in physical capital). Similar to the above, the resulting optimality conditions are thus:

$$\frac{1}{c_{t+1}^i} = \frac{\gamma h_1 \left(e_{t+1}^i, g_{t+1}^i + \sum_{j \neq i} g_{t+1}^j \right)}{h \left(e_{t+1}^i, g_{t+1}^i + \sum_{j \neq i} g_{t+1}^j \right)} = \frac{\gamma h_2 \left(e_{t+1}^i, g_{t+1}^i + \sum_{j \neq i} g_{t+1}^j \right)}{h \left(e_{t+1}^i, g_{t+1}^i + \sum_{j \neq i} g_{t+1}^j \right)}.$$

Matching procedure for historical data

A minor share of historical clan names could not have been automatically matched to a tribe. One of the reasons was that the administrative units in Central Asia during the Russian colonization did not separate regions by ethnicity and hence several administrative units (volosts) did not necessarily contain Kyrgyz clans. Based on the materials of 1953-55 expeditions, we could identify several volosts which were not populated by Kyrgyzs (but by Kazakhs) and exclude them from matching. Some of the volosts' borders contain some territory of both the current-day Kyrgyzstan and Kazakhstan. In those volosts the clan names that we could not match to a tribe are most likely Kazakh clans.

Second, there was a problem of spelling which posed difficulties for matching some clans. In 1907 the clan names were recorded by Russian geographers based on oral responses of the Kyrgyzs. The Kyrgyzs responded to the interview through an interpreter. These interpreters were usually Tatars (or Kazakhs who came under the Russian protectorate earlier than Kyrgyzs); therefore, recorded clan names could correspond to the Tatar or Kazakh phonetic rules rather than Kyrgyz ones: for example, Даулет (Daulet, Kazakh spelling) instead of Дөөлөт (Döölöt, Kyrgyz spelling). In some cases, possibly, the Russian geographers who recorded the responses misspelled the names because the Kyrgyz names

sounded phonetically unfamiliar to Russians. When we could not find the direct match of recorded clan name, we checked for the possibility of another clan name which could sound very similar. If the close match was found, we used the matched clan name. If no close match was found, clan remains unidentified. Example: Бop (Bor, misspelled name) and Boop (Boor, correct Kyrgyz spelling). In such cases the match was considered as sufficiently close. Given that clan names usually reflect the name of a historic person from whom the clan or extended family stems, it is not uncommon to have the same sub-clan names belonging to different clans. This is the difficult case where the name does not uniquely identify a clan. In these cases, we looked at the uezd (region) in which the clan resided in the distant past (the expeditions of 1907/13) and compared it with the region in which the clan resided in the 1950s. If the regions of residence in 1907/13 and 1950s overlapped, we considered the clan to be matched. Example: Белек (Belek). The clan with this name exists within the Solto tribe and within the Sarybagysh tribe. The clan Belek in the 1907 survey lived in Vostochno-Sokulukskaya volost (currently Sokulukski raion near Bishkek). According to the materials of the expedition in the 1950s Belek as part of Sarybagysh tribe lived in At-Bashy raion (in Naryn oblast). However, Belek as part of Solto tribe lived in Sokulukski raion. Hence, we decided that the clan Belek in 1907 data is more likely to be part of Solto tribe.