Foreign Mining, Labor Welfare and Local Trust: Evidence from Kyrgyzstan Gold Mine

Pengshan Pan*

May 2022

Abstract

There has been controversy over the impact of foreign natural resource investment on worker welfare and host country politics. This paper explores this question by analyzing Kyrgyzstan's dominant foreign invested gold mine, which accounted for 12.5% of Kyrgyzstan's GDP in 2020. A key finding is that the economic growth from foreign-invested mine undermines the trust of the beneficiary mining industry in local communities. Using geolocated data from household panel surveys in Kyrgyzstan from 2010 to 2016, the study shows Kumtor, this largest foreign mine, offers mining workers better incomes and social benefits. However, Kumtor mining investment creates greater inequality and social division. This study also finds that the emergence of Kumtor is associated to economic grievances of the non-mining sector. Higher corporate earnings or gold prices were associated with lower trust in local leaders by mining workers, but higher trust by manufacturing workers.

*PhD Candidate, Graduate School of Public and International Affairs, University of Pittsburgh, Pittsburgh, PA, USA

1 Introduction

The Kyrgyz Republic has large gold reserves, making a significant contribution to the national economy and attracting investment from foreign mining companies. About 10% of the nation's employment is in the extractive industries [1]. Prior to 2017, 8 of the 10 largest mining companies had foreign ownership, and their headquarters are in Canada, China, Russia, and Kazakhstan [2]. Kyrgyzstan's fiscal system is highly centralized. All revenue from the extractive industry goes to the state budget, while local governments collect only property and land taxes. Mining companies in the Kyrgyz Republic operate under the general tax regime. In addition, they also pay certain taxes such as royalties and bonuses and some non-taxes [3]. The largest gold mine, Kumtor, is owned by Canadian company Centerra Gold and accounts for 90% of the country's gold production. In 2020, Kumtor's mining operations constituted 12.5% of Kyrgyzstan's GDP.

The pros and cons of foreign investment, especially in natural resources, have long been debated. It may not improve welfare or economic performance, especially with a poor political or economic institution (Sachs and Warner 2001). This paper suggests that foreign investment may improve welfare but creates social division. Kyrgyzstan's liberal economic policies and low-cost natural resource licenses in the 2000s attracted substantial foreign mining investment. However, there have been multiple protests around Kumtor over the years in support of the nationalisation of the mine, environmental concerns and allegations of corruption. Two nationwide uprisings to overthrow the incumbent president have been linked to Kumtor. And also those corruption charges have been brought due to huge profits from Kumtors. In May 2021, new legislation allows the government to seize and operate Kumtor from its Canadian parent company for up to three months, citing "danger to locals and the environment." [4]

This paper contributes to this debate by examining the local impact of large foreign invested gold mine, focuses on the interlinkages between the foreign ownership, worker welfare and local trust. In Kyrgyzstan, the large foreign mining company, Kumtor, offers employees higher incomes and better social security, but has led to high inequality and local division. Such division plays an essential role in further less political stability and stronger local dissent. Despite the increase in income, unrest such as labor strikes and civilian protests in Kumtor area has become more frequent. The conundrum here is why foreign companies pay higher wages and better social welfare, while still causing these local dissent. My answer is that it would only benefit some workers in mining industry but undermine workers in other sectors, which exacerbates social divisions. Large foreign companies are profitable and create greater labor demand, which allows them to offer better labor benefits. Mining workers are paid better because they can claim mineral wealth directly from company profit and through state ownership. Local communities benefit from mineral wealth only through taxes, payments and regional aid funds, which is less transparent. For this reason, workers in mining who benefit from company and state ownership have lower

[1] 2017 Extractive Industries Transparency Initiative (EITI) Report
[2] 2017 Extractive Industries Transparency Initiative (EITI) Report
[3] 2017 Extractive Industries Transparency Initiative (EITI) Report
[4] https://www.centerragold.com/investor/news-releases

trust to local leaders. On the other hand, other workers in the local community have higher levels of trust in local leaders, as they can only receive mining benefits indirectly through local payments. Under this context, the increase in mining activity has weakened ties between mining workers in local communities and strengthened ties between local leaders and non-mining workers. As the result, foreign investment creates alliances between local communities and non-miners, and isolates mining workers from local communities. This research unifies the debate in the literature on whether foreign natural resource investment is beneficial or harmful to downstream.

My empirical analysis focuses on how presence of Kumtor shapes the socioeconomic well-being of workers, as well as trust in state and local communities. It exploits household mining workers who under the exposure of the mining activities and distance to Kumtor mine pit. The study uses the following datasets: Mining company information from the official website annual report and the "Life in Kyrgyzstan" (LiK) (Brück et al. 2012) household survey (2010-2016). I have been able to conclude that the social dissent caused by foreign mining companies is not due to mistreatment of mining workers. In Kyrgyzstan, mining workers have higher incomes, social securities, stabler contract, particularly those who live closer to Kumtor. I use travel time or distance between households and the mining pit location to measure the extent of mining impact. Additionally, in my robustness checks, I use different measures of mining activity such as firm revenue, production, taxes, gold prices, regional aid funding, etc. as impacts, and compare these impacts to households closer to the pit versus those farther away. Miners who live near the Kumtor deposit have higher incomes, better social welfare, and mining activities have a greater impact on miners who live within a 4-hour drive. Quantile regression analysis shows that Kumtor benefits higher income mining workers group more. If the household has no family members working in the mining industry, the income of those who live in the Kumtor area will be lower. Foreign mining company is crowding out non-mining households. Kumtor mining generally enhances trust between residents and the central government/president. Miner families living near Kumtor have less trust in local leaders. Non-mining households, especially manufacturing workers living near Kumtor, have a higher level of trust in local leaders. Instead of continuous distance to the mine, I also used dummy variables to identify treatment groups, which is if the household lived within the 4-hour drive, and outside. In all these analyses, I got consistent results. The effects decline monotonically with distance to the pit and become insignificant beyond 4 hours drive. Increased mining activity and proximity to mines weakens the trust of mining workers in local leaders and strengthens the trust of non-mining worker households in local leaders. In addition, miners have lower trust in local leaders, probably because their benefits come from gold wealth or they are more likely to be migrants, which requires further research, but it is not contradictory to that miners and non-miners are different alliances.

In Kyrgyzstan, a hybrid regime and weak state, large foreign mining companies have boosted worker benefits, offered higher wages and better insurance, but have been associated to local protests and social disintegration. Many questions can be discussed around this case: What are the pros and cons of foreign investment? Where causes conflict around foreign invested mine? If it is because of economic grievance? Is it because of foreign ownership or the natural

resource it produces? Is weak institution cause or consequence of mining investments? The case is complex and may have multiple explanations, and this article focuses solely on economic benefits and trust in local communities between different social groups. Large foreign firm improves worker welfare economically and pays profit to the state elites, thereby undermining the trust of mining workers and increasing trust of the non-mining sector in local leaders. To answer these questions can help us understand when we should expect an impact, and how to distribute the benefits of large foreign investment to affect the entire country. It provides us with more empirical evidence on the downstream effects of globalization from large firms on small countries.

Scholars have studied the downstream effect of foreign direct investment. Much of the research is based on cross-country analyses and multiple mine sites. Due to the importance of Kumtor and data limitation, only one large site was used for my study. Harrison and Scorse (2010) summarized that foreign firms will pay higher wages (Allcott and Keniston 2018), hire more unemployed workers (Marchand and J. Weber 2018) and spend more on employee training, because higher productivity levels and increased labor demand (Agerton et al. 2017; Jacobsen and Parker 2016). However, Robertson (2011; 2010) argued that FDI produces social tension and protest opportunities because of political competition. The downsides of foreign investment or foreign natural resource investment include conflict (Collier and Hoeffler 2005), mainly because of the possibility to fund dissident political groups (Paine 2016; Parker and Vadheim 2017; Berman et al. 2017; Shim 2020). It also alters the distribution of income and the poverty rate (Agerton et al. 2017; Wegenast et al. 2019), creates corruption (Fields 1980; Ross 2012; Van der Ploeg 2011; Alexeev and Zakharov 2021), has impact on educational attainment (J. G. Weber 2014),land tenure, public goods provision (Aragón and Rud 2013; Loayza, Mier y Teran, and Rigolini 2013; Dell 2010), employment structure (Wegenast et al. 2019), female workers' welfare (Kotsadam and Tolonen 2016; Ross 2008), and long term grievance (Sachs and Warner 2001; Hirschman 1958). Others also argue that the quality of FDI development outcomes depends on the interaction with local institutions (Dell 2010; Ross 2008; Alexeev and Conrad 2009; Dell 2010; Alexeev and Zakharov 2021; Van der Ploeg 2011), and state capacity also pays essential role (Besley and Persson 2009; Mann 2012; Acemoglu 2005). Shenk (2021) argues that in Colombia the relative power balance between private companies and anti-extractive expert allies has the greatest impact on the ability of communities to organize.

Consistent with or contradicting my results, some find that the fiscal windfall of foreign investment provides little to no improvement in living standards. My findings suggest that the effects may be positive for some people and negative for others. Luong and Weinthal (2010) argue that the ownership structure of foreign-invested companies is related to development outcomes and conflicts in developing countries. State and foreign mining company are the main direct claimants of mineral wealth under partially state-owned, but uncontrolled structure. At the same time, the state, local communities and the domestic populace are indirect claimants through taxation. Dual claimant status became important source of the relationship between the state, the mining industry and the general population. Centrra, the Canadian company listed on the Toronto Stock Exchange, owns Kumtor mining deposit. Kyrgyzaltyn, the largest state-owned mining company in Kyrgyzstan, owned about 30% of Centrra stock in the 2010s,

but not as a controlling majority shareholder. The company also regularly pays taxes and regional aid funds to local and state governments. The state has two sources of revenue from mineral wealth: one is through the state-owned company, which is Centrra's largest shareholder. The other is through indirect taxation. Direct profit sharing are far greater than indirect claims taxes. Miners are direct claimants of mining wealth, while non-miners are indirect claimants of mining wealth. For this reason, mining revenue weakens ties between miners and local leaders, but strengthens ties between non-miners and local leaders, because who cannot claim their wealth directly from mining company.

The analysis part of this paper is organized as follows: First, Kumtor, a large foreign mining company, is introduced. Second, it outlines protests, nationalization, tax treaties, finances, and labor conditions from Kumtor's official material. Third, it introduces data and dependent variable questions from household surveys that represent the socioeconomic status of respondents and generates descriptive questions. Fourth, the logic of how Kumtor's the ownership structure is linked to social division and political participation is discussed. Fifth, I use an empirical strategy to compare socioeconomic welfare between miners and non-miners. In the main regression table, I assess the welfare effects of mining projects by measuring the distance between households and deposits. I then analysed the beneficiary and victim groups of the mining industry, and the trust of workers in different industries far from and close to Kumtor in local leaders.

2 Background

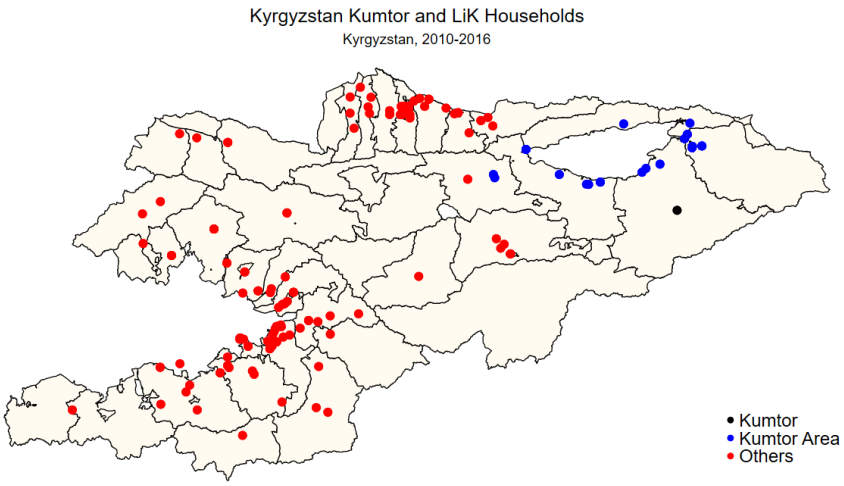
2.1 Kumtor - The Canadian Gold Company

Kumtor is the largest operational mine in Kyrgyzstan, located in Issyk Kul province. It is the one of the largest gold mines in Central Asia owned by a Western-based company, having produced more than 13.2 million ounces of gold between 1997 and the end of 2020. The Kumtor Mine is the largest private sector employer and taxpayer in the Kyrgyz Republic and the largest foreign investment in the country. Mine operations at Kumtor contributed 12.5% of Kyrgyz Gross Domestic Product in 2020, and some 99% of KGC's 2,750 employees are Kyrgyz citizens. Kyrgyzaltyn, the largest state-owned mining company, has shares in Kumtor, Terek-sai, and Altynken. Before the government temporarily confiscated Kumtor in May 2021, Kyrgyzaltyn (a joint stock company wholly owned by the Kyrgyz Republic) held about one-third of the shares of Centerra. Centerra holds a 100% interest in the Kumtor mine. Centerra's new release in May 2021 shows that Kyrgyzaltyn held 32.7% equity interest in Centerra. The map of Kyrgyzstan below shows the exact location of Kumtor, with the dots being the towns covered in the household survey sample. The blue dots are towns that are affected and covered by mining activity, in my robustness check I will adjust this area to see varying degrees of impact. The black dot is the Kumtor mine and the red dots are the unaffected towns.

The timeline table of all events related to Kumtor nationalization, since 1997 is in the appendix. In following subsections, I will mainly introduce the history of protests, tax regimes based on Kumtor's official documentations and financial

reports.

Figure 1: Kumtor Location and Sampled Towns



2.2 Protests

Mining facilities are seen as more likely to spark conflict. There have been multiple protests around Kumtor over the years in support of nationalizing the mine, environmental concerns and keeping the country profitable. Over 30 years, Kumtor has seen two nationwide uprisings that overthrew the current president and later amended three Kumtor profit-sharing agreements. Politicians played an important role in the Kumtor conflict. Why are there more protests at the mine? Common sense suggests that workers are more likely to protest if they are underpaid, unemployed or without social security. However, the study shows that foreign mining companies pay higher wages and offer better insurance, but there is more conflict related to Kumtor.

According to news released from Centerra Gold Inc. (TSX: CG) [5] and Eurasianet. I summarized the major mining protests as follows:

[5] https://www.centerragold.com/investor/news-releases

Table 1: Kumtor's Protests

Date	Description
October 6, 2020	Kumtor Mine continue uninterrupted following the recent political unrest in the Kyrgyz Republic.
May 28, 2013	The road leading to the Kumtor mine has been blocked by community protest, which is interfering with the movement of supplies and personnel to and from the mine.
May 30, 2013	National grid power supply to the Kumtor mine has been disrupted by local protestors. The road leading to the mine also continues to be blocked.
May 31, 2013	Kyrgyz Government has taken steps to remove the roadblock affecting the mine, however the Government has declared a state of emergency.
June 2, 2013	Road access to the mine was re-established and national grid power to the mine site was restored.
February 6, 2012	Unionized employees of its Kumtor operation in the Kyrgyz Republic have begun a strike. The trade union is demanding that Kumtor pay the mandatory employee contribution to the Kyrgyz Republic social fund in addition to the mandatory employer contribution paid by Kumtor.
February 14, 2012	Unionized employees at its Kumtor operation in the Kyrgyz Republic remain on strike. operation is currently suspended.
February 16, 2012	An agreement has been reached with the Kumtor Trade Union. The expected cost of the settlement for 2012 is approximately $4 million.
December 5, 2011	The transfer of diesel fuel and other supplies from the Kumtor yard to the mine has been interrupted due to roadblock.
April 8, 2010	Kumtor mine continue uninterrupted and are currently unaffected by the unrest in the country.
October1,2010	Unionized employees of it s Kumtor Mine in the Kyrgyz Republic commenced strike action.
October 11, 2010	Unionized employees of its Kumtor Mine in the Kyrgyz Republic have ended the illegal work stoppage. A new collective agreement has been ratified.
May 7, 2007	A small group of villagers (50-70 people) is blocking the road to the Kumtor mine demanding the Government and the Company make further compensation payments in relation to the May 1998 cyanide spill.
December 19, 2006	Mine department and some support services personnel have begun an illegal work stoppage at the Kumtor mine site, to the negotiations on the renewal of the current labor contract.
February 23, 2005	Kumtor mine has been unable to move employees and supplies to and from the mine site due to roadblocks on public highways.
March 28, 2005	Kumtor mine remain unaffected by the reported change in leadership in the country.
November 14, 2005	Kumtor mine is currently being restricted by illegal roadblocks. The action is related to the 1998 cyanide incident
November 21, 2005	Unrestricted access to and from its Kumtor mine following the termination of the illegal roadblocks.

2.3 Fiscal System

The fiscal system in Kyrgyzstan is highly centralized. All revenues from extractive industries go to the state budget whilst local governments only collect property tax and land tax. Mining companies in the Kyrgyz Republic operate under a general tax regime. In addition, they pay specific taxes such as royalty, bonuses and regional aid funds. If the company's profit is high, state elites are more motivated to retroactively raise tax rates or impose new taxes to meet their increased spending needs, unilaterally changing the initial terms of contracts with financial institutions. Kumtor's parent company, Centerra, claims political, commercial, economic and competitive uncertainty and unforeseen circumstances. These factors include: resource nationalism, management of external stakeholder expectations, more aggressive enforcement of laws, regulations and government practices in the Kyrgyz Republic, civil or criminal proceedings for Centerra, permits, passports or licenses. This article will not discuss too much the interaction of state with foreign companies, but more about mining workers and their relationship with local communities.

The Kumtor project is governed by an investment agreement and related agreements dated June 6, 2009 (collectively the "Kumtor Project Agreements") which provides for a fixed tax and payments regime for the Kumtor project. The 2009 restated Kumtor project agreements, approved by the Kyrgyz Republic Parliament and Constitutional Court, were reaffirmed by the Government of the Kyrgyz Republic in 2017 [6]. In 2009, the Kyrgyz Government could own up to 33.0% of Centerra. the Canadian parent company of Kumtor.

Under the new tax regime, gross revenue will be taxed at a rate of 14%, which includes a 1% monthly contribution to the Issyk-Kul Oblast Development Fund. The new tax regime replaces income tax (10% of taxable income), mineral resource tax (5% of revenue), emergency fund tax (1.5% of revenue), road tax (0.8% of revenue), withholding taxes (10-30% depending on the nature of the payment), the IssykKul Social Fund tax (2-4% of taxable income), environmental pollution charge of $310,000 per year. The main purpose of the Issyk-Kul Oblast Development Fund is for socio-economic development of the Issyk-Kul region's economy. As a result, only a small fraction of transparent profits benefit the localities, but most of the revenue goes to the central government and the firm.

The detailed items and actual taxes and payments made by Centerra to Kyrgyzstan are noted in Centerra's financial report, I attached 2011-2016 in the appendix.

[6] https://www.centerragold.com/investor/news-releases

Figure 2: The Fraction of Local Development Fund to Revenue

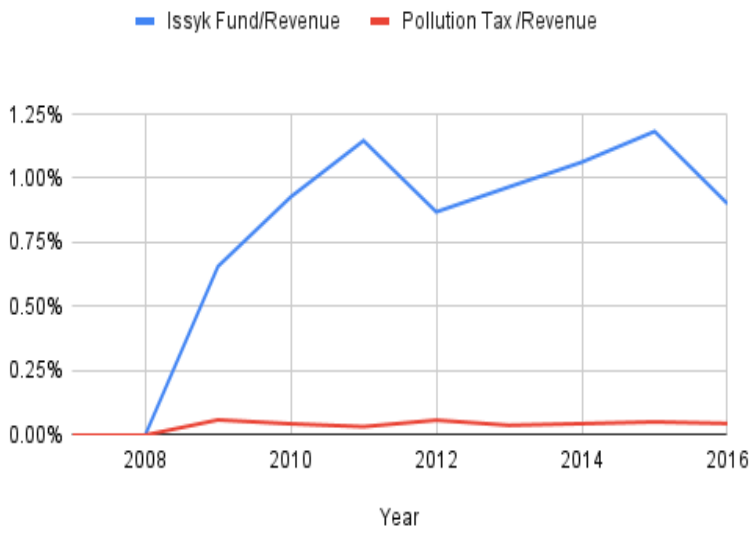
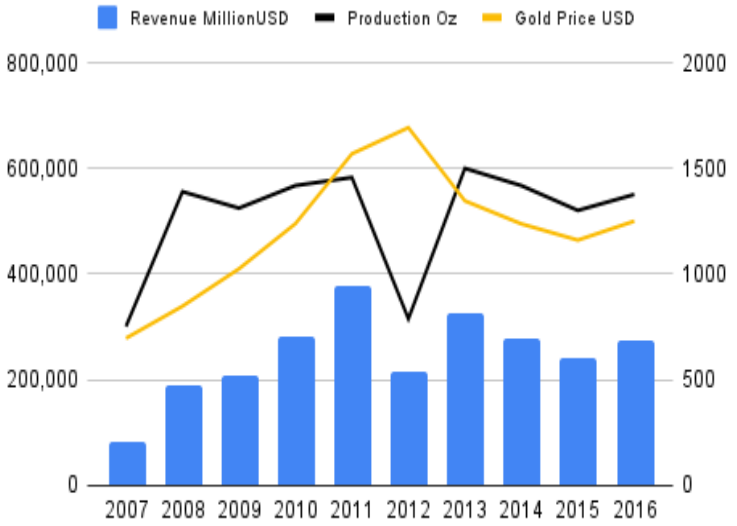


Figure 3: Revenue, Production and Gold Price



3 Analytical Framework

Former Central Asian scholars have been studying Kyrgyzstan's mining industry, according to ethnographic studies, documentation and interviews with gold mining companies and government officials. The relationship between SOEs and local communities, the well-being of mining workers, has been discussed through more observational studies, but there is not much systematic empirical quantitative work. Ocaklı, Krueger, and Niewohner (2020) summarize several possible causes of the mining conflict in Kyrgyzstan through fieldwork interviews. The mining conflict is driven by deep structural factors such as weak governance, lack of institutional trust and limited cooperation among groups of actors (Ocaklı, Krueger, and Niewöhner 2020; Ocaklı, Krueger, Janssen, et al. 2021), as well as constant violations of environmental regulation (Wooden 2013). The low capacity of the state made mining wealth a source of rent for officials, but the state was unable to stop the uprising and act as a mediator between foreign investors and local residents (Doolot and Heathershaw 2015).

This paper focuses only on one reason, which is lack of institutional trust and argues that because of the way Kumtor distributes wealth, even if it improves labor employment conditions, it undermines the initial trust between the mining sector and local communities. The foreign investment company became an enclave, separating the beneficiary mining industry from the local communities.

3.1 Ownership Structure and Wealth Distribution

Centrra, a Canadian company listed on the Toronto Stock Exchange, owns Kumtor mining deposit. Kyrgyzaltyn, the largest state-owned mining company in Kyrgyzstan, owned about a third of Centrra stock share in the 2010s, but not as a controlling majority shareholder. Luong and Weinthal (2010) argue that mineral-rich countries are cursed not by their wealth, but by the ownership structures they choose to manage their mineral wealth. Under "state ownership without control" such as Kumtor, the state and foreign investors are the main direct claimants of mineral wealth. The state also serve as shareholder over Kumtor's parent company through state ownership, and the state elite can directly claim rents on mineral wealth. At the same time, state, local elites and the domestic population are the indirect claimants through taxation. The states has two sources of revenue from mineral wealth, one from the state-owned company, which is Centrra's largest shareholder. Another is the indirect claimant of taxation. Local communities and local leaders only benefit from mineral wealth through tax and development funding. Only small amount of the mineral wealth is turned over to local taxes and claimed by local residents. Miners, the benefits of mineral wealth also are direct and indirect claimants, from corporate profits and taxes, as do the state. The domestic population are the indirect claimants only through taxation and local community.

The more profitable mining companies are, the more miners earn (Harrison and Scorse 2010). Miners have less trust in local leaders because their income comes from the company. However, locals demand benefits from the local community, and if mining wealth is high, the trust of local leaders is higher. Local communities are not happy with mining because payments and taxes to local communities are far lower than mining industry and state profits, and only a

portion of the revenue goes to local residents. As direct claimants wealth far outweigh indirect claimants, this exacerbates social divisions due to high income disparities between mining and non-mining industries and between state and local leaders.

A weak fiscal systems includes unstable and implicit tax system, and expenditure system that undermine budget stability and transparency. Under this ownership structure, state elites and SOE bureaucrats legitimize their privilege to obtain mineral rents by deliberately concealing taxes on the population. Instead, domestic owned companies can promote a strong fiscal system. It legalizes property rights and stable taxation, while foreign owned company always intends to make tax implicit. The stable tax regime under domestic ownership ensures that both domestic private owners and government elites have a predictable source of revenue. It also prevents state elites from engaging in populist-style social spending. Under foreign owned companies, the fiscal regime is partly restrictive. In the initial stage, foreign investors participates in exploration and take the initial development risk. When risk became lower and profit became higher, state elites are not only bargaining for more profit and share, but also arbitrarily increase spending and unilaterally change the original contract. So they are more motivated to retroactively raise tax rates or impose new taxes to meet their increased spending needs, unilaterally changing the initial terms of contracts with financial institutions. Shenk (2021) also argues that the threat of losing potential or real investment from companies, discouraged by community action, can incentives politicians to act in favor of corporate interests.

To sum up, because the above factors are all important, this study takes this foreign-owned natural resource company with a state-owned as the largest shareholder and under a weak institution as an example. Large foreign-invested companies are often seen as "enclaves" that do not have a positive local impact (Hirschman 1958). In this context, it is necessary to understand under what circumstances foreign enclaves like Kumtor can be a booster of regional revenue. The answer is that the wealth distribution systems create different alliances of beneficiaries. Therefore, we can view the activity of the mine as a shock to Kumtor's mineral wealth. A analytical framework is the membership of the mining company and households in the Kumtor surrounding area as treated groups. It analyzes the direct and indirect impacts of mining activities on different groups of sectors. Thus, the effect of this mining shock is to increase wages in the mining sector and in the surrounding areas of Kumtor, relative to the more distant and non-mining sector. As mining revenue and gold prices increase, the mining industry will also be separated from local communities because of its tie with the company.

3.2 Research Questions

The main question is: If foreign mining companies pay higher salaries and are more likely to encounter local resistance, why? Mining protests can have many causes: inequality, environmental degradation, health concerns, political mobilization and xenophobia. In this research, I only focus on inequality and social distrust. People may be dissatisfied because mining investments only benefit the mining industry and hurt others. Also, others around the mining industry earn less. All revenue from the extractive industries goes to the national budget,

while local governments collect small portion of the tax. Mining can only be loyal to the state, not local leaders. So the questions I want to answer in this article are:

- Do foreign investment firms pay higher wages, provide better welfare and hire more workers? Yes, generally, foreign firms pay higher wages and hire more unemployed workers, as foreign firms have higher productivity and generate large demand of labor (Harrison and Scorse 2010).
- Does foreign investment in natural resources trigger local conflicts due to worsening welfare of local workers? No. In this case, foreign natural resource investment raises the wages of mining workers but hurts manufacturing workers.
- Who are the beneficiaries and victims of foreign mining investment? Mining workers benefit if they live close to the large Kumtor deposit. However, income inequality is higher among miners near the Kumtor mine.
- How does the foreign mining industry shape social relationships between workers in different industries, and their attitudes toward local communities? Mining workers, especially high-income workers, have less trust in local leaders. However, other industries that did not benefit much from the company had higher levels of trust in local leaders if mining revenue increased. Those in manufacturing are more likely to develop stronger ties with local leaders.

The mining demand shock will increase the firm revenue as well as income of mining workers. To answer above questions, I have the following testable predictions:

- The closer mining workers live near Kumtor, the higher income and social security coverage they have. The effect is stronger from surrounding areas to further areas of Kumtor.
- If gold production, company revenue and gold prices are higher, miners' income and social security should improve later, and this impact on Kumtor surrounding areas should be greater.
- Kumtor Mining Company's welfare impact only applies to workers in the mining industry. If no one in the family works in the mining industry, the above effects will be reversed.
- When miners live in the surrounding area of Kumtor or when mining activity is stronger, they have stronger trust in the state and less trust in local leaders in later years.
- In the area around Kumtor and when the mining activity is stronger, workers without family members in the mining industry would have lower trust in the state and higher trust in local leaders.

4 Data

This study evaluated the socioeconomic effects of foreign mining company in a small country, which combines household data with information about Kumtor

mining company's activities between 2007 and 2016. The LiK survey (Brück et al. 2014), a country-wide general household survey includes demographic information and socioeconomic questions. I used code "coate" to identify the location of all households, which is "State Classification of Administrative and Territorial Units" and used as post-soviet administrative identification code. The distance between households and mining deposits is scrapped with Python from Google API service. Then, respondents in the household survey were matched with the foreign mining company Kumtor, which allowed me to compare who lived around the mining town or not. To quantify exposure to Kumtor, the center of mine activity, I not only constructed measures of distance and driving time from home to the pit, but also differentiated Kumtor and non-Kumtor areas by 4.5 hours or outside driving time. The dataset also includes respondents' occupations and major economic activities in each community. I determined whether the respondent was a miner, whether the household had at least one miner, and whether the worker was in manufacturing. There are also descriptive statistics on mining family and miners.

To measure mine activity, I collected data of Kumtor, from the parent company Centerra Gold Inc.'s annual report on revenue, average annual gold price, and total production, and the Issyk Fund, a regional aid fund to local residents. The data is annual and covers the period from 2006 to 2016. Issyk Fund is only around 1 percent of total revenue. The sharp decline in production and gold prices in 2012 and a slow recovery could be a good exogenous shock.

4.1 Household Survey - Life in Kyrgyzstan

4.1.1 Basic information

My dependent variables were socio-economic questions in the LiK survey. This is the most comprehensive public attitude survey data and is geo-coded at the village level, which allowed me to link mining companies with individuals. This dataset had 3,000 households and 8,000 individuals in five waves: 2010, 2011, 2012, 2013, and 2016. It included seven Kyrgyz regions (oblasts), the two cities of Bishkek and Osh, 136 towns (villages), and 33 mining towns. The questions concerned household demographics, assets, expenditure, migration, employment, agricultural markets, shocks, social networks, subjective well-being, and many other topics. In my analysis, I used address, occupation, basic demographic information, and questions concerning well-being, income, trust and employment information.

4.1.2 List of Variables

Descriptive table below summarizes questions in my analysis concerning well-being, income, trust and employment. The table summarizes the number, mean value, and standard deviation of each question. I used dummy variables; "0" indicated "no" and "1" indicated "yes" in yes/no questions. The survey also used 0 to 10 to scale the level of health satisfaction.

Descriptive statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
written contract	14,263	0.476	0.499	0	1
working training	14,263	0.564	0.496	0	1
social security	13,475	0.564	0.800	0	1
income	11,869	7,741	6,180	0	170,000
health satisfaction	42,067	7.044	2.460	0	10
distance	41,654	554,121	226,845	9,979	1.089e+06
travel_time	41,654	34,665	16,859	995	64,341
president trust	40,278	2.628	0.960	1	4
local leader trust	40,167	2.650	0.943	1	4
business leader trust	39,238	2.412	0.906	1	4
miner	46,174	0.00790	0.0886	0	1
miner family	46,174	0.0482	0.214	0	1

4.2 Miners and Non-miners

The study separately evaluated foreign-owned firms' treatment effect on miners and non-miners. It also shows the t-test between miners and non-miners by year. In this table, I compare welfare responses between non-miners and miners. The table shows mean (non-miners) – mean (miners) by each year. This analysis provided a brief overview of miners across years. (1) Most of mining workers live close to Kumtor towns. (2) Miners have much higher incomes than non-miners and this gap becomes gradually higher over ten years. (3) Miners' working hours have been gradually longer than other workers over ten years. (4) Miners are working in larger companies. (5) Miners now have improved written contracts, better training, and more job security but in recent years these advantages became less significant. (6) It is easier for miners to find employment and they generally have better health and increased income satisfaction. (7) There are less and less mining workers living around Kumtor.

Table 2: T-Test: mean(nonminers)-mean(miners)

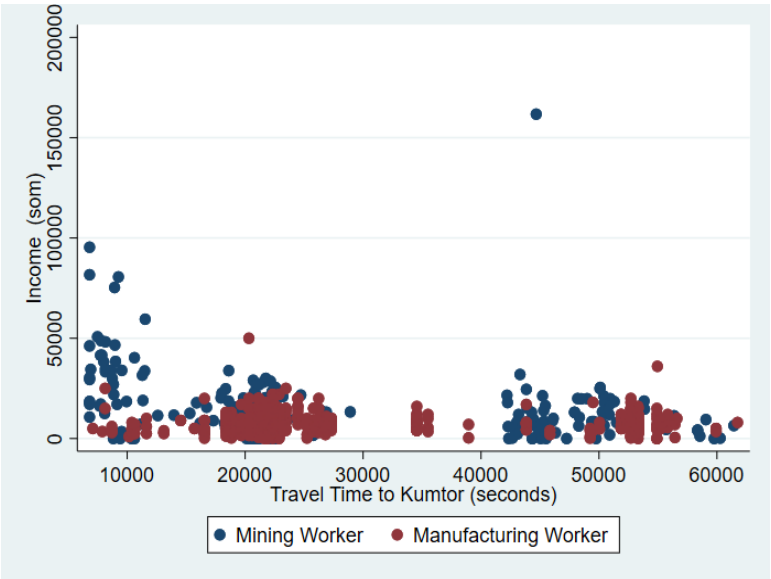
	2010	2011	2012	2013	2016
job permanent	0.0619	-0.195***	0.156**	0.0462	-0.00433
	-1.52	(-5.69)	-3.13	-1.62	(-0.10)
N	8154	8059	8156	8258	8012
working hours	-7.214***	-3.342	-5.485***	-4.241*	-9.570***
	(-3.39)	(-1.95)	(-3.74)	(-2.50)	(-4.66)
N	4130	4523	4810	6086	3929
company size	-100.1***	-83.95**	-85.52***	-179.9***	-128.9**
	(-5.14)	(-2.89)	(-4.05)	(-7.83)	(-3.14)
N	2648	2998	3173	3269	2086
written contract	-0.179**	-0.195**	-0.456***	0.00951	-0.064
	(-2.72)	(-3.03)	(-6.89)	-0.19	(-1.01)
N	2659	3009	3192	3303	2097
work instruction	-0.301***	-0.313***	-0.393***	-0.277***	0.0823
	(-4.61)	(-4.81)	(-5.87)	(-5.82)	-1.37
N	2659	3009	3192	3303	2097
income	-3129.6***	-4111.2***	-4185.9***	-8345.2***	-8343.1***
	(-5.22)	(-5.92)	(-5.81)	(-14.68)	(-7.55)
N	2117	2336	2236	3218	1959
not enough jobs		0.218***	0.211***	0.213***	0.00932
		-4.09	-4.17	-4.19	-0.69
N		8160	8066	8175	7022
health satisfaction	-0.28	0.0261	-1.353***	-1.186***	-0.0596
	(-0.78)	-0.09	(-4.50)	(-5.15)	(-0.24)
N	8154	8047	8175	8817	8046
job satisfaction	-0.59	-0.105	-1.561***	-1.598***	-0.911***
	(-1.68)	(-0.34)	(-5.02)	(-4.89)	(-3.32)
N	4187	5011	5123	5475	6037
alochlic	-0.241***	-0.196***	-0.0135	0.0784*	-0.188***
	(-4.89)	(-4.30)	(-0.30)	-2.3	(-4.66)
N	8160	8066	8175	8817	8045
income satisfaction	-0.197	-0.422	-1.400***	-1.198***	-0.945***
	(-0.57)	(-1.36)	(-4.31)	(-4.24)	(-3.42)
N	4187	6215	6469	6934	7031
president	0.511***	-0.203	-0.216	0.193*	0.0127
	-3.88	(-1.62)	(-1.93)	-2.09	-0.12
N	8114	7735	8995	7752	7682
local leader	-0.0429	0.073	-0.233	0.302***	-0.0653
	(-0.33)	-0.61	(-1.86)	-3.31	(-0.61)
N	8114	7735	8995	7714	7609
business leaders	0.209	-0.0377	-0.0583	0.477***	0.0439
	-1.79	(-0.33)	(-0.53)	-5.08	-0.4
N	8114	7735	8995	7232	7162
distance	96058.4***	65716.8*	109072.6***	124698.8***	547.9
	-3.33	-2.37	-3.86	-5.75	-0.02
N	8215	8258	8311	8789	8081
travel time	7761.4***	5802.2**	8675.5***	10582.4***	1714
	-3.59	-2.79	-4.13	-6.59	-0.79
N	8215	8258	8311	8789	8081

5 Empirical Strategy

5.1 Distance and Welfare

The graph below can give us a simple overview, more miners live closer to the Kumtor mine. Miners living near the Kumtor mine have higher overall income, especially in the area around Kumtor. However, there are also many low-income miners, suggesting a higher level of inequality around Kumtor. Additionally, Kumtor deposits crowd out manufacturing workers. There are fewer manufacturing workers around Kumtor and their incomes are lower. In this case, I use 4.5 hours drive, 16000 seconds, as the threshold for the Kumtor area.

Figure 4: Income of Mining Workers and Manufacturing Workers



5.2 Empirical Specification

Despite that miners overall have better income and social welfare, my preliminary empirical analysis shows that mining workers who live closer to Kumtor have higher income and better social welfare than non surrounding regions. To identify this analysis, I use two methods to measure the variety of effects. I measure distance effects in terms of travel distance and time between households and Kumtor. Using python from Google API service I scrapped the distance between households and the deposit. I then collected firm revenue, gold production, and gold prices to measure the variety of mining activity effects, and I also used 1- and 2-year lag effects.

First, to evaluate the effect of the mine exposure on measures of living standards, I assume that the impact of Kumtor decreases with distance, and I will estimate the following regression:

$$Y_{idt} = \beta_0 + \beta_1 LnDistance_{idt} + \beta_1 Miner_{idt} + \beta_3 LnDistance_{idt} * Miner_{idt} + \theta_d + \gamma t + \epsilon_{idt}$$

where Y_{idt} is the outcome variable for person i in district d at year t. The outcome variable was the logarithm of income, or a measure of social welfare, ie, dummy variables if the individual had a written contract, formal job training, and social security. Also, another outcome variable I use is personal health satisfaction from level 1 to 10. $LnDistance_{idt}$ is the logarithm of the distance (meters) used to measure the distance between household and the Kumtor Gold Mine. If the individual is a miner, $Miner$ is the job identifier. $LnDistance_{idt} * Miner_{idt}$ is interaction term of occupation and distance. All regressions controlled for year and region fixed effects. I use logit regression if the outcome variable is a dummy variable. I'm also switching job identifier from miners to the non-mining sector to see if that makes a difference to other groups. $nonminer_{idt}$ is a dummy variable that I swap $Miner_{idt}$ for in the empirical equation if no one in the individual's household works in mining. Gold mining should have a greater impact on miners, decreases with increasing distance. For non-miners, the effect will be reversed. Empirical tests also assessed effects on other outcome variables, such as written contracts, job training, social security, and health satisfaction.

Second, I still refer to the household distance from the Kumtor as a source of heterogeneous exposure to the gold shock from the mine. However, the sources of heterogeneity come in two ways. I divide distances ranging from 0 to 4.5 hour drive from distance larger than 4.5 hour drive as Kumtor area and non-Kumtor area. In the main specification, the division of the area into two dummy categories, far pit and near pit, 4.5 hour is the threshold. Therefore, the degree of mining activity in the Kumtor area was used as the treatment, and those further away as untreated group. Then I utilize several mining activity measures. It includes the annual production of gold, the annual income of gold, the annual average price of gold and the Issyk-Kul Region Development Fund. As previously mentioned, the increase in gold mining has increased employment opportunities and improved local income and welfare for residents of the Kumtor area. At the same time, residents far from the Kumtor area will not be treated. If absence of mine exposure, results will be similar for areas far and near the pit, so more data are required for pre-trend analysis. To assess the impact of

mines by this method, I estimated the following regressions:

$Y_{idt} = \beta_0 + \beta_1 Kumtor_{id} + \beta_1 Miner_{idt} + \beta_3 Kumtor_{id} * Miner_{idt} + \beta_4 lnM_t * Kumtor_{id} + \beta_5 lnM_t * Kumtor_{id} * Miner_{idt} + \theta_d + \gamma t + \epsilon_{idt}$

where Y_{idt} is the outcome variable for individual i in region d at year t. Outcome variables can be logarithms of income and measures of living standards. M_t is a measure of mine activity, lagged by one or two years to allow the market to adjust. M_t I replace between annual gold production, annual gold income, annual average price of gold and the Issyk-Kul Region Development Fund. $Kumtor_{id}$ is a dummy variable if the individual lives in the Kumtor area approximately 4.5 hours to the pit. $Miner$ is the job identifier if the individual is working in mining industry. All regressions controlled for year and region fixed effects. Then the estimation would be the impact of Kumtor on trust to local communities and the state. The dependent variables are Y_{idt} trust in central government/president and trust in local leaders, ranging from 1 to 4. I also switch job identifiers from miners to non-mining sectors to see if that makes a difference to other groups. $nonminer_{idt}$ is a dummy variable that I replace $Miner_{idt}$ with in the empirical equation if no one in the individual household is engaged in mining. $mfg_{\cdot idt}$ is a dummy variable that if the individual works in manufacturing. I also used quantile regression to show the effect of Kumtor on miner income for each quantile. I only evaluate the 25 50 and 75 quantiles for mining workers, including OLS and year/region dummy controls. However, there may be other unobserved time-varying factors associated with mines and affecting different regions closer and further to the mine, which would invalidate my identification. I will address these more.

Table 3: Welfare effect of Kumtor

VARIABLES	(1) income	(2) income	(3) contract	(4) training	(5) social security	(6) health
ln_dis×miner	-0.766***		-1.209***	-4.232***	-1.408***	-0.435**
	(-4.61)		(-4.12)	(-8.28)	(-4.99)	(-2.67)
ln_distance	0.132**	-0.330*	0.179***	0.568***	0.820***	0.173
	(2.93)	(-1.89)	(2.91)	(9.13)	(10.73)	(0.71)
miner	10.481***		16.577***	56.818***	18.196***	6.133**
	(4.90)		(4.34)	(8.42)	(4.98)	(2.96)
non-miner		-6.261**				
		(-3.10)				
ln_dis×nonminer		0.462**				
		(2.99)				
Year FE	Y	Y	Y	Y	Y	Y
District FE	Y	Y	Y	Y	Y	Y
Observations	11,748	11,748	14,198	14,198	13,426	41,013
R-squared	0.176	0.167				0.025

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Income effect of Kumtor Mining Activity

VARIABLES	(1) income	(2) income	(3) income	(4) income	(5) income	(6) income
miner×ln_M×Kum	-0.153	-0.351*	1.139	0.864***	0.641***	0.025
	(-0.74)	(-1.88)	(1.55)	(4.48)	(3.93)	(0.38)
ln_M×Kum	0.210	0.152	-1.576	-0.288	-0.250	-0.123
	(1.14)	(0.84)	(-1.62)	(-1.35)	(-1.53)	(-1.28)
Kumtor	-2.935	-2.164	20.684	1.870	1.457	0.041
	(-1.17)	(-0.93)	(1.60)	(1.36)	(1.36)	(0.18)
miner	0.390***	0.390***	0.390***	0.390***	0.390***	0.376***
	(5.22)	(5.21)	(5.22)	(5.22)	(5.22)	(5.53)
year_lagged	0	1	2	2	2	2
miner×Kumtor	controlled	controlled	controlled	controlled	controlled	controlled
ln_M	controlled	controlled	controlled	controlled	controlled	controlled
ln_M	production	production	production	goldprice	revenue	IssykFund
Year FE	Y	Y	Y	Y	Y	Y
District FE	Y	Y	Y	Y	Y	Y
Observations	11,749	11,749	11,749	11,749	11,749	9,648
R-squared	0.176	0.176	0.176	0.176	0.177	0.142

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Income effect of Kumtor Mining Activity, non-mining households

VARIABLES	(1) income	(2) income	(3) income	(4) income
nonminer×ln_M×Kum	-2.631	-1.060***	-1.362***	-0.287*
	(-1.77)	(-4.17)	(-4.71)	(-2.21)
ln_M×Kum	1.155	0.807***	1.065***	0.178**
	(1.10)	(4.80)	(5.44)	(2.89)
Kumtor	-14.812	-4.755***	-7.048***	0.247
	(-1.07)	(-4.78)	(-5.49)	(1.26)
nonminer	-0.141**	-0.141**	-0.141**	-0.124**
	(-2.99)	(-2.99)	(-2.99)	(-2.53)
year_lagged	2	2	2	2
miner×Kumtor	controlled	controlled	controlled	controlled
ln_M	controlled	controlled	controlled	controlled
ln_M	production	revenue	goldprice	IssykFund
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Observations	11,749	11,749	11,749	9,648
R-squared	0.166	0.166	0.166	0.131

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Quantile Regression for Income and Distance to Kumtor

OLS Bootstrap

Income	Coefficient	std. err.	t	P>t
q25				
travel time	-0.0853	0.0195	-4.37	0
cons	8810	860	10.3	0
q50				
travel time	-0.107	0.0381	-2.81	0.005
cons	12400	1710	7.27	0
q75				
travel time	-0.286	0.105	-2.73	0.007
cons	25200	3720	6.77	0

Year+District Dummy Controlled

Income	Coefficient	std. err.	t	P>t
q25				
travel_time	-0.07	0.03	-2.7	0.01
_cons	14800	4310	3.42	0
q50				
travel_time	-0.11	0.03	-3.77	0
_cons	24400	4940	4.93	0
q75				
travel_time	-0.16	0.03	-5.92	0
_cons	39600	4620	8.58	0

Figure 5: Quantile Results for Income around Kumtor

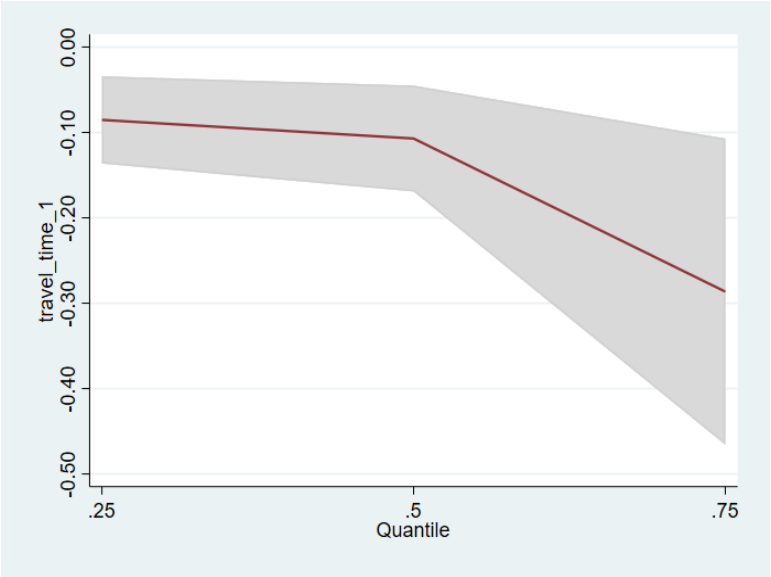


Table 7: Trust Effect of Kumtor

VARIABLES	(1) pres.	(2) local leader	(3) pres.	(4) local leader	(5) pres.	(6) local leader
Kumtor	0.227***	-0.034	0.163	-0.239	0.226***	-0.049
	(5.35)	(-0.26)	(1.70)	(-1.46)	(5.42)	(-0.37)
miner	-0.052	0.007				
	(-0.56)	(0.07)				
Kumtor×miner	-0.119	-0.478***				
	(-1.38)	(-4.14)				
nonminer			-0.021	-0.057		
			(-0.23)	(-0.70)		
Kumtor×nonm.			0.065	0.209*		
			(0.79)	(2.28)		
mfg.					-0.036	-0.284***
					(-0.56)	(-4.52)
Kumtor×mfg.					-0.131	0.288**
					(-1.03)	(2.41)
Year FE	Y	Y	Y	Y	Y	Y
District FE	Y	Y	Y	Y	Y	Y
Observations	39,279	39,164	39,279	39,164	39,279	39,164
R-squared	0.078	0.005	0.078	0.005	0.078	0.008

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Trust Effect of Kumtor Mining Activity

VARIABLES	(1) local leader	(2) local leader	(3) local leader	(4) local leader
Kumtor×miner×c.ln_M	-0.759***		-0.956***	
	(-7.46)		(-8.25)	
Kumtor×mfg.×c.ln_M		0.256**		0.385***
		(2.98)		(3.47)
miner	1.657		2.192	
	(0.95)		(0.97)	
mfg.		-0.568		-0.761
		(-0.54)		(-0.57)
year_lagged	2	2	2	2
1.Kumtor×c.ln_M	controlled	controlled	controlled	controlled
1.sector×c.ln_M	controlled	controlled	controlled	controlled
Kumtor×1.sector	controlled	controlled	controlled	controlled
ln_M	controlled	controlled	controlled	controlled
ln_M	revenue	revenue	goldprice	goldprice
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Observations	39,164	39,164	39,164	39,164
R-squared	0.006	0.008	0.006	0.008

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.3 Results

I can summarize some results from the table. All regressions include year and region fixed effects. The regression tables are: Kumtor's income effect; Kumtor's income effect by mining activities, on mining and non-mining households; Quantile impact on income from Kumtor; Kumtor's trust effect; Kumtor's trust effect of mining activities. The table results are as follows:

- Table of Income Effect of Kumtor: Generally Kumtor only offers higher income for mining sector people. Miners who live closer to Kumtor are paid much higher. Income variance is much higher near Kumtor, and the other sector workers who live closer to kumtor are even lower paid. The explanation may be manufacturing workers switch to Kumtor. Miners living closer to Kumtor are more likely to have formal contract, working training, social security and health satisfaction. If the individual is in a household where no one works in the mining industry, the individual's income will be lower when living closer to Kumtor.
- Table of Income Effect of Kumtor Mining Activity: Miners in the Kumtor mine (4.5 hours drive) earn higher income. At the same time, if the gold price or revenue of Kumtor increases, the income of miners will also increase, with a 2-year lag effect. The wage effect of Kumtor also applies to miners across the country. However, the mining activity effect does not apply to gold production and Issyk funds, which means that production and local aid funds have little effect on mining worker welfare.
- Table of Income Effect of Kumtor Mining Activity for non-mining family: Non-miners at the Kumtor mine (4.5 hours drive) earn less because they are crowded out by the mining industry. At the same time, if Kumtor's gold price or revenue increases, non-miners will also receive less income. If they lived near Kumtor, the income would be lower. At the same time, the 2-year lag effect is significant. Interestingly, the role of local regional funds has only a small impact. Gold production has little impact.
- Quantile regression of income and distance from Kumtor: Mining development only benefits miners, especially those with higher income quantiles. Quantile regression shows that high-income miners (above the 0.5 quantile) have a stronger impact on Kumtor's wealth than low-income miners. The results can explain that mining not only increases income, but also creates inequality. High-income workers benefited from mining wealth, but low-income workers remained poor. Mining distance has a heterogeneous effect on different income levels of mining workers.
- Trust Effect of Kumtor: My analysis shows that foreign mining companies face local community dissatisfaction as it erodes trust between mining industry and local leaders. In general, all households living near Kumtor have higher levels of trust in the central government and the president than other households. Miners living in the Kumtor region have low levels of trust in local leaders. But if the household around Kumtor don't have a member works in mining, their trust in local leaders is higher. Manufacturing workers, who were thought to be displaced by the mining industry, had higher levels of trust in local leaders. Mining development will only

improve the lives of high-income miners, and creates an alliance between local leaders and manufacturing workers against mining industry and the state.

- Trust Effect of Kumtor Mining Activity: With 2-years lag, mining activity had a heterogeneous impact on mining workers and manufacturing workers. In this table, I only focus on trust to local leaders because the impact on state governments and the president is not significant. As mining activity increases, such as higher mining revenue and higher gold prices, miners' trust in local leaders becomes weaker, while trust from manufacturing workers becomes stronger. In this case, mining activities will create more social divisions and isolate mining workers from local communities. I also controlled for the interaction term between the Kumtor dummy, sector dummy and mining activity.

Migrants from outside of Kumtor are also likely to migrate to the Kumtor area, as mining has brought them with higher incomes. I would still look at whether the trust change is coming from locals or from migrants, that's a major concern.

6 Conclusion

This study investigates the impact of foreign natural resource investment on the well-being of workers in Kyrgyzstan. It focuses on mining workers, local communities and Kumtor, the largest mining company. In general, Kyrgyz miners living near foreign deposits have high wages and good benefits. Foreign companies offer them safer jobs, higher wages, and higher health satisfaction. Conflict is also associated with mining towns, as mining deposits alter trust between mining workers and local communities in different sectors. Foreign mines benefit only some miners, not other residents. As mining wealth increased, the beneficiary mining industry was isolated from the local community. My analysis shows that miners living near the Kumtor deposit have higher incomes, better social welfare, and a greater impact on who live within a 4.5-hour drive. Due to the unequal flow of large amounts of gold wealth into state and the mining industry, only a few of the wealth benefit local communities. It creates alliances between non-mining workers and local authorities to oppose mining workers and the state. Local conflict is more likely to occur around mining towns with high levels of mistrust.

The main contribution of this paper is to improve understanding of the conditions under which foreign companies promote local development. Extractive industries in particular can deliver positive development to mining workers, but the unequal distribution of wealth does not satisfy everyone. A major limitation of this article is that I have only observed mine operations for a short time span without conducting an adequate pre-trend analysis. The other is because I only used the National Household Survey, which is more objective but with small sample size of mining workers and without tracking individuals history. A special feature is that this article uses only one very important case. It is not like other studies that focus primarily on cross-country, multi-site studies.

This policy implication is, under weak government, and policies that promote local procurement and employment may needs to be more beneficial to local

residents than increased public spending. And more transparent aid to local residents or higher engagement between the mining industry and local communities would helping easing the conflict. The natural resources of developing countries are often seen as obstacles to economic development. In most cases, institutional failures such as conflict or corruption are main issues of the inability to translate natural wealth into better living standards. This paper argues that the key issue may not be because it is mining, but the way ownership is structured and the distribution of wealth. Domestic control or greater involvement of local communities may benefit more population.

Appendix. A Timeline of Kumtor

Table 9 Timeline of Kumtor

1997	Commercial gold production began.
1998	Cyanide leak, affect 2000 people
2002	Gold production at Kumtor exceeded 100 tonnes
2004.6.22	Project restructuring. Centerra Gold Inc. was formed.
2005.4	Tulip Revolution, President Askar Akayev fled the country
2005.8	Kumtor Protest, road block
2006	95 million USD invested in the Kumtor modernization program.
2006.7	Protests outside of the Kumtor, Demanding compensation for damages from cyanide spill; consensus reached
2007.4.18	Rally on Kumtor gold mine, ask for nationalization
2007.5.4	8 km from Barskoon village Road block
2009	Parliament of the Kyrgyz Republic signed and ratified the Agreement on New Terms for the Kumtor Project.
2010	183 million USD was invested in capital expenditures.
2012	Largest investments in the development of production – 385.2 million USD.
2012.2.7	Workers At Kyrgyzstan's Largest Gold Mine On Strike
2012.6.22	Kyrgyz Parliament May Revoke Gold Mine License.
2012.10.3	Anti-Gold-Mine Protest Turns Violent in Kyrgyzstan, Kyrgyz police clashed with at least 1,000 opposition protesters, some of whom had tried to storm a government building in the center of capital, Bishkek. The protesters were demanding that the government nationalize the Kumtor gold mine. Protesters Demand Release Of Kyrgyz Opposition Leaders
2012.11.12	Dozens Picket Kyrgyz Parliament, Demand Release Of Opposition Leaders
2012	After the Kumtor protest, the Kyrgyz Parliament conducted an environmental investigation of the nationalization of mines and required a larger share of stock to state-owned Kyrgyzstan Companies.

Table 10 Timeline of Kumtor

2013.2.1	Special working group to review the contract for its Canadian-owned Kumtor gold mine.
2013.3.29	Three Kyrgyz Opposition Leaders Jailed On Plot Charges. The demonstrators had demanded the nationalization of the country's Kumtor gold mine
2013.5.31	Questioning The Environmental Cost Of Kyrgyzstan's Kumtor Gold Mine
2013.6.3	Kyrgyz President Almazbek Atambaev has lifted a state of emergency
2013.6.27	Kyrgyz Protesters Again Demand Nationalization Of Major Gold Mine and cut off power to the Kumtor mine
2013.10.8	Protesters used a truck, trees, and later, burning tires to block access to the area
2013.10.31	More Kyrgyz Officials Face Corruption Charges Over Kumtor. ministers have already been charged with corruption in connection to Kumtor in recent
2013.10.11	Ten Charged In Kyrgyz Mine Protest
2014.1.7	Kyrgyz Cabinet In Urgent Debate On Kumtor Gold Mine. The Environmental Cost Of Kyrgyzstan's Kumtor Gold Mine The original deal signed in.
2014.3.25	Kyrgyzstan's Acting Prime Minister Resigns. Satybaldiev was also blamed for not resolving the problems surrounding the foreign-run Kumtor gold mine, which the Kyrgyz government is seeking to gain a greater stake in.
2014.5.29	Head Of Kyrgyz Gold Firm Faces Court Hearing On Fraud Charges
2014.4.17	Newly appointed Kyrgyz Prime Minister Joomart Otorbaev. Just two weeks after his appointment, he spoke controversial issues of Kumtor mine
2014	Transfer of operations activities from Kumtor Operating Company to Kumtor Gold Company.
2014.9.30	Avalanche In Kyrgyzstan Kills Gold Mine Worker
2015.4.24	Kyrgyz President Accepts Government's Resignation. Kyrgyz President Almazbek Atambaev has accepted the resignation of Prime Minister Joomart Otorbaev and his government.
2015.4.23	Otorbaev submitted his resignation amid renewed controversy over the operations of Kumtor.
2014.8.28	Kyrgyz government attempts to acquire more shares of the Kumtor gold mine

Table 11 Timeline of Kumtor

2016.5.2	Foreign Managers Of Kumtor Gold Leave Kyrgyzstan After Raid
2016.6.7	Kyrgyzstan Launches Legal Proceedings Against Kumtor to secure the pollution fee claim.
2017	Strategic Agreement on Environmental Protection and Investment Promotion among the Government of the Kyrgyz Republic and Kumtor
2017.8.2	Ex-Kyrgyz Lawmaker Japarov Jailed On Hostage-Taking Charge, who played critical role in 2013 protests around the Kumtor gold mine by demonstrators demanding that the mine.
2017	The government adopted new amendments to its water code, which, in effect, legalised mine production at two glaciers, Davydov and Lysy.
2018	different protests brought seven mining concessions to a halt, at least temporarily, including the Shambesai gold project in Maidan under the new investor.
2020.3.2	Dozens Detained As Police Disperse Protest In Support Of Jailed Kyrgyz Politician Japarov
2020.10.7	Thousands Back In Bishkek Streets Demanding 'Clean' Politicians For New Government. Protestors freed Atambayev from prison. Recently, he was imprisoned, facing charges of corruption and manslaughter.
2020.10.10	After a failed assassination attempt, however, he was imprisoned again on 10 October. The Kyrgyz government also claims Kumtor owes $170 million in unpaid taxes.
2021.5.8	the Oktyabr district court in Bishkek ordered the Kumtor Gold Company to pay about $3.2 million for environmental damage.
2021.5.14	Kyrgyz President Signs Law Allowing External Management Of Kumtor Gold Mine
2021.5.17	Kyrgyz Parliament Supports Seizure Of Canadian-Run Gold Mine. Centerra Gold's mining concession agreement was being revoked over what he called "corruption" and "violations of safety and environmental regulations."
2021.5.31	Former Kyrgyz PM Detained In Gold-Mine
2021.8.2	Kyrgyz Ex-President Akaev Returns For Questioning Over Gold Mine Kyrgyz Ex-PM Babanov Released From Custody of corruption in the case related to the Kumtor gold mine.Since June 3 The stock has fallen 30 per cent this year.
2021.8.3	Another Kyrgyz Ex-PM Detained Amid Growing Kumtor Mine Investigation into alleged corruption.

Appendix. B Nationalization

To sum up, before the government temporarily confiscated Kumtor in May 2021, Kyrgyzaltyn (a joint stock company wholly owned by the Kyrgyz Republic) held about one-third of the shares of Centerra, and the specific share varies from year to year. Centerra holds a 100% interest in the Kumtor mine. Centerra's new release in May 2021 shows that Kyrgyzaltyn held 32.7% equity interest in Centerra.

In 1992, Cameco and the Government of the Kyrgyz Republic entered into an agreement to evaluate and develop the Kumtor gold deposit. Cameco acquired a one-third interest in Kumtor Gold Company (KGC) from the Government of the Kyrgyz Republic, with Kyrgyzaltyn (a joint-stock company wholly owned by the Kyrgyz Republic) holding the remaining two-thirds interest. That same year, the Cameco Corporation became the full owner of Kumtor.

But following a restructuring in 2003, Cameco's and part of the state's share went to a Cameco subsidiary, Centerra, diluting the state's hold to 33%. Kyrgyzaltyn and Cameco Gold sold all of their shares in KGC (and KOC) effective June 22, 2004 in exchange for common shares in Centerra. Centerra holds a 100% interest in the Kumtor Mine. According to the agreement on October 31, 2007, Kyrgyz Government will own 29.3% of Centerra, Cameco will own 40.5% and the balance, 30.2%, will be held by the remaining shareholders.

On April 24, 2009, Centerra negotiated a New Terms Agreement between Centerra, the government of the Krygyz Republic and Cameco Corporation. Upon completion of closing the public offering and share transfer to Kyrgyzaltyn JSC, Cameco disposed of its entire interest in Centerra. In 2009, the Kyrgyz Government could own up to 33.0% of Centerra, Cameco 37.8% and the balance, 29.2%, would be held by the remaining shareholders.

In 2012, advocates called for the nationalization of the mine due to accusations against Centerra Gold's environmental violations and corruption. In 2013, Centerra Gold announces that it has entered into a non-binding Heads of Agreement (the "HOA") Kyrgyzaltyn would exchange its 32.7% equity interest in Centerra for a 50% interest in a joint venture company that would own the Kumtor Project, however, rejected by Parliament.

The government temporarily seized Kumtor in May 2021, as it was believed that mining deposits were harming local residents and the environment. Local activists protested and claimed that the companies should compensate for environmental issues.

August 30, 2007 Company and Cameco Corporation have reached binding agreements with the Government of the Kyrgyz Republic.The Company and the Government have agreed to replace Kumtor's current tax regime with a simplified new tax rate for the Kumtor Project applied to gross revenue at the rate of 11% in 2008, 12% in 2009 and 13% thereafter. At current gold prices the revised tax regime is slightly beneficial to the Kumtor Project. Below is the tax code applied on April 24, 2009;

The history of shareholding changes is summarized as follows[7]:

[7]https://www.centerragold.com/investor/news-releases

• January 3, **2022**: Centerra Gold Inc. in negotiations with representatives of the Kyrgyz Republic to resolve their disputes related to Centerra's Kumtor Mine and the seizure of control of the mine by the Kyrgyz government in May 2021. Resolution would involve the following principal terms
  – Centerra receiving the approximately 26.1% in Centerra common shares held by Kyrgyzaltyn JSC (an instrumentality of the Kyrgyz Republic). Upon receipt, Centerra would cancel the shares surrendered by Kyrgyzaltyn JSC.
  – The Kyrgyz Republic receiving, and assuming all responsibility for, the Company's two Kyrgyz subsidiaries and the Kumtor Mine.
  – Payment by Centerra of a cash amount equal to the net amount of the three dividends paid by Centerra in 2021 that Kyrgyzaltyn JSC did not receive as a result of the seizure of the mine and certain other financial consideration associated with the settlement of intercompany balances between Centerra and its two Kyrgyz subsidiaries.
  – The resignation from Centerra's Board of Directors of Kyrgyzaltyn JSC's two nominees.
- May 17, **2021** Centerra Gold Inc. announced today that, as a result of the recent events in the Kyrgyz Republic, Kyrgyzaltyn JSC, together with its affiliates, are prohibited from transferring or encumbering any common shares of the Company ("Centerra shares") or exercising any voting rights attached to Centerra shares. In addition, dividends or distributions on Centerra shares that would otherwise be payable to Kyrgyzaltyn or its affiliates will be donated to the Company to the extent such dividends or distributions can be attributed reasonably to Kumtor Gold Company ("KGC") (or its assets or operations) or distributions from KGC.
- These prohibitions and restrictions are provided for under the 2009 Shareholders Agreement between Centerra and Kyrgyzaltyn JSC, the state-owned entity through which the Kyrgyz Republic owns approximately 26% of the Centerra shares, and their duration cannot currently be determined.
- The Company has accepted the resignation of Tengiz Bolturuk as a director of Centerra with immediate effect on the basis that Mr. Bolturuk is unable to discharge his fiduciary and similar duties and obligations to the Company. Mr. Bolturuk joined the Centerra Board of Directors in December 2020 as a nominee of Kyrgyzaltyn JSC. The Company is conducting an investigation into recent statements by Mr. Bolturuk regarding his involvement in, and support for, the events ongoing in the Kyrgyz Republic, as well as the involvement of, and coordination with, others.
- December 24, **2013** non-binding Heads of Agreement (the "HOA") with the Government of the Kyrgyz Republic and Kyrgyzaltyn JSC ("Kyrgyzaltyn"):
- Kyrgyzaltyn would exchange its 32.7% equity interest in Cen-

terra for a 50% interest in a joint venture company that would own the Kumtor Project.

- February 6, 2014 Parliament of the Kyrgyz Republic has adopted a resolution today after completing a review of the previously announced non-binding Heads of Agreement (the "HOA").
- December 22, 2015, the Company had received notice from the Kyrgyz Republic Prime Minister notifying Centerra of the Kyrgyz Republic Government's intention to withdraw from further negotiations.
- June 11, **2009** Centerra Gold Inc. (TSX: CG) announced today the closing of all transactions under the Agreement on New Terms between Centerra,
- Centerra has agreed to issue to the Government 18,232,615 common shares from its treasury and Cameco has agreed to transfer to the Government up to 25,300,000 common shares of Centerra, which are to be released to the Government upon the satisfaction of certain conditions, including, among other things, if Cameco's interest in Centerra falls below 10,800,000 common shares of Centerra and until that time Cameco retains voting control over approximately 52.7% of the issued and outstanding shares of Centerra. Annual payment of 4% of gross revenue against which all capital and exploration expenditures in the Kyrgyz Republic are fully credited.
- After closing of the transactions and upon the satisfaction of all conditions to the transfer of shares by Cameco, the Kyrgyz Government could own up to 33.0% of Centerra, Cameco 37.8% and the balance, 29.2%, would be held by the remaining shareholders.
- April 4, **2007** - Prime Minister of the Kyrgyz Republic, Mr. Almazbeck Atambaev, stated today that the top leadership of the country would not nationalize gold mines. October 22, 2007 – President of the Kyrgyz Republic has issued a decree dismissing the Kyrgyz Parliament
- August 30, 2007 Company and Cameco Corporation have reached binding agreements with the Government of the Kyrgyz Republic.
  - After final agreements are signed, Cameco will transfer 32.3 million shares of Centerra to the Kyrgyz Government; 17.3 million of such shares will be held in escrow to be released within four years subject to conditions described in Cameco's press release today. Centerra has agreed in its negotiations with the Government, that Centerra will issue 10 million treasury shares to Cameco after final agreements are signed. The issuance of treasury shares will result in a 4.6% dilution to Centerra's shareholders.
  - After completion of the transactions, the Kyrgyz Government will own 29.3% of Centerra, Cameco will own 40.5% and the balance, 30.2%, will be held by the remaining shareholders.

Appendix. C Kumtor Taxation Code

- a tax on gross revenue of 13%, payable monthly (the "Gross Proceeds Tax");
- customs administration fees at generally applicable rates, which are not to exceed those rates in effect on April 24, 2009;
- a contribution of 1% of gross revenue to the Issyk-Kul Oblast Development Fund (the "Issyk-Kul Contribution");
- an annual payment of 4% of gross revenue against which all capital and exploration expenditures in the Kyrgyz Republic are fully credited, with expenditures not required for credit in any particular year carried forward for credit in future years;
- an environmental pollution charge of $310,000 per year;
- a land use and access fee of $1,250,000 per quarter, against which the Gross Proceeds Tax and Issyk-Kul Contribution are credited in full;
- sales tax at generally applicable rates on goods and services purchased in relation to the Kumtor Mine;
- value added tax at generally applicable rates on goods and services purchased by KGC and KOC, except for goods and services imported in relation to the Kumtor Mine;
- generally applicable fees for licenses, registrations, travel visas and other fees for discrete government services, provided that such fees shall not exceed those in effect on April 24, 2009;
- payroll deductions for all employees subject to Kyrgyz Republic income tax and contributions to the Social Fund of the Kyrgyz Republic in respect of employees who are Kyrgyz Republic citizens, in each case at generally applicable rates; and
- excise taxes at generally applicable rates except on goods imported in relation to the Kumtor Mine Effective June 6, 2009, a management fee fixed at $1 per ounce of gold sold, inclusive of any taxes, is payable by Centerra to Kyrgyzaltyn.

Table 12: Kumtor's taxes and payments to Kyrgyz

In USD millions	2011	2012	2013	2014	2015	2016
Taxes, customs & other mandatory payments	138.394	103.194	79.875	92.59	98.708	86.949
Social Insurance Fund	24.269	19.886	20.609	19.87	17.049	17.906
Issyk-Kul Development Fund	10.79	4.638	7.838	7.384	7.149	6.16
Licenses & permits	0.28	0.259	0.3	0.208	0.269	0.458
Pollution tax and payments to the Environment Protection Agency	0.31	0.31	0.31	0.31	0.31	0.31
Payments to Kyrgyzaltyn	0.607		0.254	0.384	0.298	0.472
Refinery	2.947	1.884	4.372	3.313	3.31	3.825
Revenue from the sale of Centerra shares			-	-	-	-
Dividends	30.167	5.836	11.902	11.164	9.616	7.097
Purchases in the Kyrgyz Republic:	-					
– supplies & services	79.953	54.178	50.801	59.873	42.519	37.052
– foods	4.949	5.278	5.307	4.924	4.472	4.049
Kyrgyz-infrastructure-related payments:						
– electricity	12.429	10.941	11.253	10.413	12.633	12.962
– roads outside the mine site	1.559	1.53	2.186	1.763	1.867	1.596
KGC employees' net wage	64.793	66.575	69.358	65.919	56.026	59.244
Sanatoria treatment	0.12	0.136	-	-	-	-
Sponsorships	0.109	0.074	0.072	0.738	0.504	0.664
sustainable development projects	1.211	2.921	5.935	4.482	2.008	0.706
Government contributions	10	21	-	Missing		
Settlements				.		
Contribution to Nature Development Fund	0.286			.	-	-
Payments to communities	-		-		-	-
Total	383.172	298.641	270.372	.	256.728	238.45

Appendix. D Gold Price and ESG Reports

Gold prices play an important role in mining activities, and the sharp decline in 2012-2013 may have been a essential contributor to mining conflicts. Social divisions will widen as falling gold prices reduce mining revenue and earnings. ESG (Environmental, Social and Governance) reports show the company's worker benefits at the time. Generally, Kumtor workers have higher wages and benefits, but a higher chance of injury.

Figure 6: Gold Price - U.S dollar

Table 13: Kumtor workers' welfare

Year	2019	2018	2017	2016	2015	2014	2013
Annual medicals	1960	2633	2870	2485	2440	2398	2201
Lost time injuries (LTI's)	2	4	1	9	3	4	5
First aid	4	9	13	17	16	16	24
Kyrgyz minimum wage per hour	10.58	10.06	7.14	6.33	5.8	5.4	5.18
Kumtor entry-level wage per hour	109.18	99.35	94.62	86.2	78.2	73.34	65.86
Kyrgyz national (Total)	2591	2596	2627	2488	2470	2550	2597
Expat a (Total)	40	45	66	71	80	99	103
-women	293	305	321	323	328	358	354
Total Employee Training Hours	102882	104258	127999	94334	71628	NA	NA
Entitled to parental Leave	7	12	7	8	22	27	22

Table 14: Centerra Cash Flows, million US$

	2009	2010	2011	2012	2013	2009-2013
Revenue	685	850	1 020	661	944	4 160
Costs	625	528	649	805	786	3 393
Cost of sales	296	342	382	383	559	1 962
Revenue-based tax in Kyrgyz Republic	60	99	132	75	114	480
Administrative costs	56	73	66	48	54	297
Other costs	213	14	69	299	59	654
Net earnings	60	322	371	-144	158	767
Other cash provided by operations	186	-41	64	317	326	852
Depreciation	104	76	99	153	309	741
Revenue-based taxes applied (advanced)				-30	20	-10
Other items	82	-117	-35	194	-3	121
Cash provided by operations	246	281	435	173	484	1 619
Investment activities	-220	-120	-474	-87	-441	-1 342
Additions to property, plant and equipment	-92	-208	-175	-405	-309	-1 189
Net redemption (+)/purchase (-) of short-term investments	-128	64	-290	325	-110	-139
Other investments	0	24	-9	-7	-22	-14
Financing ac vi es	2	-8	-97	52	-34	-85
Dividends paid	0	-14	-99	-22	-31	-166
Other financing items	2	6	2	74	-3	81
Increase in cash during the year	27	154	-135	139	9	194

References

Acemoglu, Daron (2005). "Politics and economics in weak and strong states". In: *Journal of monetary Economics* 52.7, pp. 1199–1226.

Agerton, Mark et al. (2017). "Employment impacts of upstream oil and gas investment in the United States". In: *Energy Economics* 62, pp. 171–180.

Alexeev, Michael and Robert Conrad (2009). "The elusive curse of oil". In: *The review of Economics and Statistics* 91.3, pp. 586–598.

Alexeev, Michael and Nikita Zakharov (2021). "Who Profits from Windfalls in Oil Tax Revenue? Inequality, Protests, and the Role of Corruption". In.

Allcott, Hunt and Daniel Keniston (2018). "Dutch disease or agglomeration? The local economic effects of natural resource booms in modern America". In: *The Review of Economic Studies* 85.2, pp. 695–731.

Aragón, Fernando M and Juan Pablo Rud (2013). "Natural resources and local communities: evidence from a Peruvian gold mine". In: *American Economic Journal: Economic Policy* 5.2, pp. 1–25.

Berman, Nicolas et al. (June 2017). "This Mine Is Mine! How Minerals Fuel Conflicts in Africa". In: *American Economic Review* 107.6, pp. 1564–1610. DOI: 10.1257/aer.20150774. URL: https://www.aeaweb.org/articles?id=10.1257/aer.20150774.

Besley, Timothy and Torsten Persson (2009). "The origins of state capacity: Property rights, taxation, and politics". In: *American economic review* 99.4, pp. 1218–44.

Brück, Tilman et al. (2012). *Household Survey Data for Research on Well-Being and Behavior in Central Asia*. IZA Discussion Papers 7055. Institute of Labor Economics (IZA). URL: https://EconPapers.repec.org/RePEc:iza:izadps:dp7055.

– (2014). "Household survey data for research on well-being and behavior in Central Asia". In: *Journal of Comparative Economics* 42.3, pp. 819–835.

Collier, Paul and Anke Hoeffler (2005). "Resource rents, governance, and conflict". In: *Journal of conflict resolution* 49.4, pp. 625–633.

Dell, Melissa (2010). "The persistent effects of Peru's mining mita". In: *Econometrica* 78.6, pp. 1863–1903.

Doolot, Asel and John Heathershaw (2015). "State as resource, mediator and performer: understanding the local and global politics of gold mining in Kyrgyzstan". In: *Central Asian Survey* 34.1, pp. 93–109.

Fields, Gary S (1980). *Poverty, inequality, and development*. CUP Archive.

Harrison, Ann and Jason Scorse (2010). "Multinationals and Anti-Sweatshop Activism". en. In: *THE AMERICAN ECONOMIC REVIEW* 100.1, p. 32.

Hirschman, Albert O (1958). *The strategy of economic development*. Tech. rep.

Jacobsen, Grant D and Dominic P Parker (2016). "The economic aftermath of resource booms: evidence from boomtowns in the American West". In: *The Economic Journal* 126.593, pp. 1092–1128.

Kotsadam, Andreas and Anja Tolonen (2016). "African Mining, Gender, and Local Employment". In: *World Development* 83.C, pp. 325–339. URL: https://EconPapers.repec.org/RePEc:eee:wdevel:v:83:y:2016:i:c:p:325-339.

Loayza, Norman, Alfredo Mier y Teran, and Jamele Rigolini (2013). "Poverty, inequality, and the local natural resource curse". In: *World Bank Policy Research Working Paper* 6366.

Luong, Pauline Jones and Erika Weinthal (2010). *Oil is not a curse: Ownership structure and institutions in Soviet successor states*. Cambridge University Press.

Mann, Michael (2012). *The sources of social power: volume 1, a history of power from the beginning to AD 1760*. Vol. 1. Cambridge university press.

Marchand, Joseph and Jeremy Weber (2018). "Local labor markets and natural resources: A synthesis of the literature". In: *Journal of Economic Surveys* 32.2, pp. 469–490.

Ocaklı, Beril, Tobias Krueger, Marco A Janssen, et al. (2021). "Taking the discourse seriously: Rational self-interest and resistance to mining in Kyrgyzstan". In: *Ecological Economics* 189, p. 107177.

Ocaklı, Beril, Tobias Krueger, and Jörg Niewöhner (2020). "Shades of Conflict in Kyrgyzstan: National Actor Perceptions and Behaviour in Mining". In: *International Journal of the Commons* 14.1.

Paine, Jack (2016). "Rethinking the conflict "Resource Curse": How oil wealth prevents center-seeking civil wars". In: *International Organization* 70.4, pp. 727–761.

Parker, Dominic P and Bryan Vadheim (2017). "Resource cursed or policy cursed? US regulation of conflict minerals and violence in the Congo". In: *Journal of the Association of Environmental and Resource Economists* 4.1, pp. 1–49.

Robertson, Graeme B. (2010). *The Politics of Protest in Hybrid Regimes: Managing Dissent in Post-Communist Russia*. en. DOI: 10.1017/CBO9780511921209. Cambridge: Cambridge University Press. ISBN: 978-0-511-92120-9. URL: http://ebooks.cambridge.org/ref/id/CBO9780511921209.

Robertson, Graeme B. and Emmanuel Teitelbaum (July 2011). "Foreign Direct Investment, Regime Type, and Labor Protest in Developing Countries: FDI, REGIME TYPE, AND STRIKES". en. In: *American Journal of Political Science* 55.3, pp. 665–677. ISSN: 00925853. DOI: 10.1111/j.1540-5907.2011.00510.x.

Ross, Michael L. (Feb. 2008). "Oil, Islam, and Women". en. In: *American Political Science Review* 102.1, pp. 107–123. ISSN: 0003-0554, 1537-5943. DOI: 10.1017/S0003055408080040.

– (2012). *The Oil Curse*. STU - Student edition. DOI: 10.2307/j.ctt7s3wz. Princeton University Press. ISBN: 978-0-691-15963-8. URL: www.jstor.org/stable/j.ctt7s3wz.

Sachs, Jeffrey D and Andrew M Warner (2001). "The curse of natural resources". In: *European economic review* 45.4-6, pp. 827–838.

Shenk, Jamie L (2021). "Consultations and Competing Claims: Implementing Participatory Institutions in Colombia's Extractives Industries". In: *Comparative Politics*.

Shim, Gyu Sang (2020). "The Location of Extractive FDI and Armed Conflicts". In.

Van der Ploeg, Frederick (2011). "Natural resources: curse or blessing?" In: *Journal of Economic literature* 49.2, pp. 366–420.

Weber, Jeremy G (2014). "A decade of natural gas development: The makings of a resource curse?" In: *Resource and Energy Economics* 37, pp. 168–183.

Wegenast, Tim et al. (June 2019). "At Africa's expense? Disaggregating the employment effects of Chinese mining operations in sub-Saharan Africa". en.

In: *World Development* 118, pp. 39–51. ISSN: 0305750X. DOI: 10.1016/j.worlddev.2019.02.007.

Wooden, Amanda E (2013). "Another way of saying enough: environmental concern and popular mobilization in Kyrgyzstan". In: *Post-Soviet Affairs* 29.4, pp. 314–353.