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Oil rents shocks and corruption in Iran

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Abstract

We investigate the response of the news-based corruption reflection index to positive shocks in oil rents in Iran. Using annual data spanning from 1962 to 2019, we employ the vector autoregressive model and analyze generalized impulse responses. Our findings reveal a statistically significant and positive (increasing) response of corruption to positive oil rent shocks. The primary mechanisms through which this relationship operates encompass inflation, increased military expenditures, and the erosion of democratic institutions. Our results demonstrate robustness when subjected to alternative corruption measurements, and when considering the role of internal conflict. The outcomes remain consistent regardless of the variable order in the estimation process. Additionally, we offer context from Iran and expound on clientelism in public investment projects, providing insight into how oil rents may contribute to corruption.

KEYWORDS

corruption, Iran, oil rents, resource curse, vector autoregressive (VAR) model

JEL CLASSIFICATION

D72, D73, Q32, Q33, Q38

Reza Zamani conducted part of this research as a visiting researcher at CNMS.

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1 | INTRODUCTION

How does corruption respond to positive shocks in oil rents? We aim to answer this question for the case of Iran. Additionally, we endeavor to examine the mechanisms through which oil rent shocks influence corruption within Iranian society. Understanding the nexus between corruption and oil rents will provide insights into the resource curse phenomenon in Iran, thereby shedding light on potential policies to mitigate its impact.¹

Oil rents have been a crucial source of foreign exchange revenues in Iran since 1960. According to OPEC (2023) data, the share of oil in Iran's total export revenues was approximately 92% before the Islamic revolution (1960–1978). Although this ratio declined after the revolution, it remains high, averaging around 71% from 1979 to 2021.

Corruption has emerged as a growing institutional challenge in Iran. The estimated control of corruption score for Iran, which reflects perceptions of both petty and grand corruption, has been consistently negative since 1996 (the earliest available data from the World Bank, 2023). In recent years, corruption levels have increased, which leads to the frequently asked question: What is the contribution of oil rents to corruption in Iran? Surprisingly, a long-term analysis examining the dynamic relationship between oil rents and corruption in a resource-rich country like Iran is missing. Given the significant role of high levels of corruption coupled with a young demographic structure as a driver of political instability (Farzanegan & Witthuhn, 2017), the urgency to investigate this relationship becomes more evident.

Generally, scholars argue that in countries lacking natural resources, governments need to tax economic agents and individuals, thereby increasing pressure for accountability and transparency (Ross, 2012). This heightened risk of corruption detection arises due to the reliance on taxation and its associated accountability. However, in natural resource-rich countries, governments can finance their expenditures through the rents generated from natural resources. Consequently, this reduces the need for taxation and the urgency to improve formal institutions. Moreover, research has shown that in natural resource-rich countries, individuals tend to exhibit rent-seeking behavior, while governments support their clients through redistributive policies such as public employment, subsidies, and public investment projects (Torvik, 2002).

To the best of our knowledge, our study is the first empirical investigation of the dynamic relationship between different types of corruption (news-based corruption reflection and country expert judgment-based corruption indexes) and oil rent shocks for Iran. We acknowledge that higher levels of oil rents can increase the risk of corruption through the weakening of democratic institutions or the strengthening of autocracy, among other factors. Higher public corruption can incentivize the maximization of resource extraction for personal gain, thus resulting in the neglect of necessary economic and political reforms and economic diversification efforts. We address the simultaneous relationship between corruption and oil rents by using a vector autoregressive (VAR) model, treating all variables as endogenous. In addition, we investigate and provide empirical evidence for the various channels through which oil rents may influence corruption. By examining these channels, we aim to gain a better understanding of the mechanisms at play. Finally, we also provide a brief review of clientelism in public investment projects in Iran.

Our results demonstrate a positive and statistically significant response of corruption to a positive shock in oil rents, even after controlling for factors such as economic growth rate, inflation rate, military spending, and democracy. Additionally, our findings reveal that several key channels connect oil rents to corruption, including economic growth, inflation, government budget, and political institutions. In sensitivity checks, we demonstrate that our main results,

based on the reflection of corruption in news, are robust to alternative measures of corruption. Alternative measures of corruption, derived from assessments by country experts as part of the V-Dem (Varieties of Democracy) project, also lead to similar conclusions.

The remainder of the paper is organized as follows: In the second section, we provide the theoretical background on the resource curse and its connection to corruption, along with a comprehensive literature review. Within this section, we also explore the case study of Iran, analyzing and comparing the effects of oil price shocks in the 1970s and 2000s on corruption levels, as well as the economic and political responses of the government. Furthermore, we discuss the opportunity cost of white elephant projects in Iran during the 2000s, serving as illustrative examples of clientelism in a resource-rich country. In the third section, we present the methodology and data employed in our study. We provide details on the analytical approach utilized to explore the relationship between oil rents and corruption. In the fourth section, we present and interpret our results and sensitivity checks. Finally, we conclude the paper in the fifth section, summarizing the main insights derived from our study.

2 | THEORETICAL LITERATURE AND BACKGROUND FOR THE CASE OF IRAN

2.1 | Natural resources and corruption

Initial studies on the resource curse focus on the effects of natural resources on the economic growth rate, showing that resource-rich countries, on average and in the long term, grow slower than resource-poor economies (Sachs & Warner, 2001). Since then, a growing number of studies have focused on the transmission channels of the curse, such as the lower prominence of education both in quantity and quality (Farzanegan & Thum, 2020; Gylfason, 2001), the quality of governance (Abman & Longbrake, 2023; Bhattacharyya & Hodler, 2010), higher risk of conflict and violence especially in ethnically and politically fractionalized countries as well as in centralized administrations (Bjorvatn et al., 2012; Bjorvatn & Farzanegan, 2015; Farzanegan et al., 2018; Fearon, 2005), Dutch disease, unemployment, inflation and distortion of the currency market (van Wijnbergen, 1984), and rising inequality (Farzanegan & Krieger, 2019).

Our focus in this study is to examine the corruption-oil rents nexus in Iran. The question, “Does oil corrupt?” has also captured the attention of scholars examining various case studies. In a recent study, James and Rivera (2022) use a news-based corruption index at the US state level over 40 years. Their findings indicated a higher prevalence of corruption in states rich in oil resources within the United States. Utilizing a natural occurrence, namely the discovery of oil in Sao Tome and Principe, a West African island nation with low income, and a standard difference-in-difference estimator, Vicente (2010) shows notable rises in the perception of corruption across various public services and resource allocations following the oil discovery. This increase is most pronounced in areas such as vote buying, education, and customs.

There are various theoretical arguments that suggest higher levels of corruption can be expected following an increase in oil rents. We summarize these theoretical arguments and relevant empirical evidence below:

1. *Repression effect*: Scholars argue that in resource-rich countries, governments tend to suppress democracy and transparency. Additionally, due to the revenue generated from natural resources, the government discourages the demand for political system reforms (Ross, 2001).

Increased repression and restricted access to information reduce the risk of engaging in corruption. An example of the repression effect can be observed in Iran during the pre-revolutionary period when the Iranian government established a single-party system (known as The Party of Resurrection of the Iranian Nation) and encouraged all citizens to join this political party (Farzanegan, 2022). Through this political suppression, the government aimed to suppress democratic demands (Pesaran, 1982; Skocpol, 1982).

2. *Militarization effect*: During periods of repression, governments often prioritize bolstering military forces to maintain control over the political system. However, militarization tends to increase corruption (Ali & Solarin, 2020; Gupta et al., 2001), creating barriers to the reporting or supervising of corrupt activities.
3. *Clientelism effect*: According to Robinson and Verdier (2013), politicians employ redistributive policies to address the political commitment problem and signal to voters that they are acting in their best interests. This form of distributive politics is known as “patronage” or “clientelism” wherein patrons (i.e., politicians) provide support to their clients. Examples of clientelism include the distribution of public jobs or positions. However, patronage policies tend to result in lower efficiency, as politicians distribute rents to secure or prolong their power rather than to better the lives of their constituency. In this context, ideology often outweighs economic efficiency and inequality increases the likelihood of clientelism (Robinson & Verdier, 2013). Moreover, scholars argue that the likelihood of clientelism is particularly high in oil-rich countries. Titeca and Edmond (2019) found that oil resources can serve as a significant source of patronage and rent extraction. With rent extraction from oil production and redistributive policies supported by oil revenues, the government can exert control over the process of wealth creation and political influence (Titeca & Edmond, 2019). A higher level of clientelism in the public sector increases the probability of the resource curse (Robinson et al., 2006) and corruption. Another example of clientelism is the “white elephant” problem, which refers to public investments that lack social benefits (Robinson & Torvik, 2005). The main characteristic of white elephant projects is the lack of cost-benefit analyses. Many of these projects commence without proper feasibility studies or transparent tendering processes. Some public investment projects are politically driven and economically detrimental. Additionally, the choice of land and location for public projects often depends on the influence of politicians. The white elephant problem also exacerbates corruption by promoting the misallocation of public resources.
4. *Research and development (R&D) and diversification effect*: Resource dependence hampers the potential of the industrial sector, leading to a decrease in R&D levels in resource-dependent countries (Wen & Jia, 2022). This is because governments can rely on international companies, using the revenues generated from natural resources to fulfill their technological needs. Additionally, governments often focus solely on industries related to natural resources, resulting in limited exports of natural resources and related commodities. Consequently, there is a low level of diversification in the export of goods and services. Achieving a diversified economy requires companies to operate within a competitive economic structure, which necessitates robust regulations and low corruption. Consequently, resource-dependent countries, with their low levels of R&D and diversification, face less pressure to be competitive and transparent. This further emphasizes the barrier to diversification caused by higher oil rents in MENA countries (Matallah, 2022).
5. *Rentier effect*: Mahdavy (1970) conducted a study on the patterns and challenges of economic development in Iran as a rentier state. Since then, several scholars have shed light on the rentier effect on economic performance in resource-rich countries. Ross (2001) identifies

- various channels through which the rentier state negatively impacts the quality of institutions, including corruption. Torvik (2002) argues that natural resources amplify rent-seeking behavior, while Caselli and Cunningham (2009) contend that substantial oil revenues support rent-seeking activities. Furthermore, some researchers have focused on the role of larger oil companies and their involvement in rent-seeking activities (Amuzegar & Fekrat, 1971; Mahdavy, 1970; Pesaran, 1982), which can include corruption (Mauro, 1995).
6. *Political instability and conflict effect*: The effect of political instability and conflict is closely tied to the wealth generated by natural resources such as ore and oil (Ishak & Farzanegan, 2022). Studies by Collier and Hoeffler (2004) indicate that the abundance of natural resources can provide financial support to rebel groups, thereby increasing the likelihood of violent conflicts (Collier & Hoeffler, 2005; Farzanegan & Zamani 2024). Additionally, Serra (2006) points out that corruption tends to be more prevalent in regions where political instability is a major concern. Moreover, the revenue derived from natural resources has the potential to exacerbate the fragmentation of national interests, leading to internal conflicts and political instability (Bjorvatn & Farzanegan, 2015; Shaxson, 2007).
 7. *Competition effect*: According to Ades and Di Tella (1999), there is a correlation between higher competition and lower levels of corruption. Additionally, they find that political rights, which serve as a proxy for political competition, have a negative impact on corruption. However, their research reveals that countries rich in natural resources hinder both political and economic competition, resulting in higher levels of corruption. To examine competition in economic markets, they use market dominance as a measure and propose the hypothesis that “natural rents, such as those derived from oil, and rents resulting from the absence of production market competition, contribute to the prevalence of corruption.”

2.2 | Oil rents and corruption: Background from Iran

Figure 1 demonstrates a sharp increase in corruption levels from 1974 to 1977 in Iran. This period coincided with an oil price shock that began in 1973 and continued until 1977, resulting in a significant rise in oil revenue per capita (refer to Figure 2). This positive correlation aligns with the existing literature on natural resources and corruption. A similar pattern occurred in the 2000s, with a sharp increase in oil prices from 2006 to 2010. During this period, both the corruption reflection index (CRI) and oil export income per capita experienced significant growth (Figures 1 and 2).

The second phase of a substantial increase in CRI can be observed during the years 1992–1995, reaching its highest point since 1962. Figure 4 illustrates a significant rise in inflation during this period, soaring from approximately 20% in 1992 to about 50% in 1995. Notably, the 50% inflation rate in 1995 represents the highest level of inflation between 1962 and 2020. This positive correlation between inflation and corruption suggests that inflation serves as one of the channels through which corruption may increase in Iran.

Furthermore, Figure 6 shows a gradual and positive change in the level of the liberal democracy index from 1963 to 1972. However, this positive trend reversed in 1973 and persisted until 1978 due to the oil price shock of the 1970s. Consequently, a negative correlation emerged between the quality of institutions and oil revenues (as well as corruption), which is in line with the theoretical background. In the following sections, we will examine these issues in detail. For now, we will focus on two specific aspects to shed light on the effect of oil revenues on corruption in Iran.

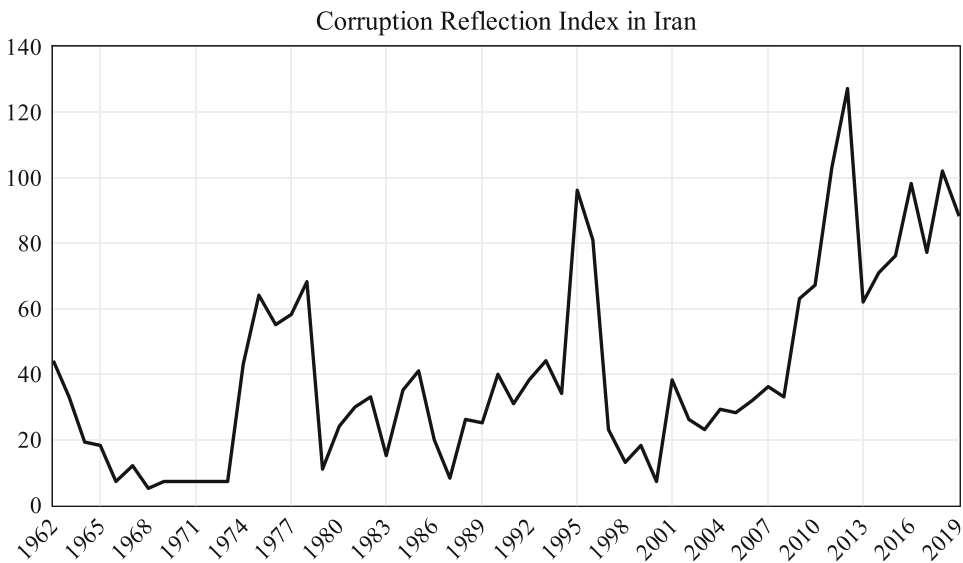


FIGURE 1 Corruption reflection index (CRI) in Iran.

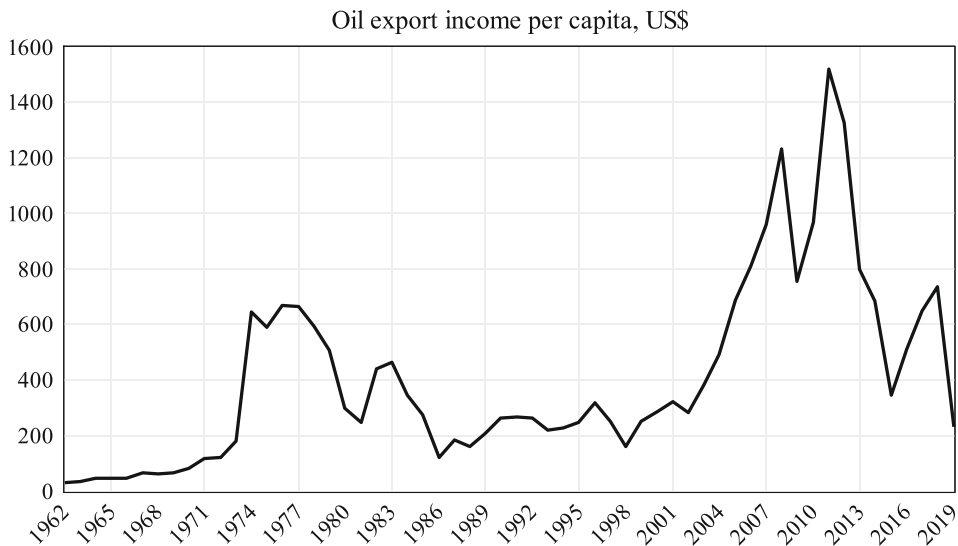


FIGURE 2 Oil export income per capita in Iran.

First, we emphasize the diverse of corruption within the resource curse, which can persist even with a change in the political system. To illustrate this point, we compare the economic and political conditions in Iran during the 1970s and the 2000s, two periods marked by significant oil shocks and distinct political systems. Second, we analyze the drivers and costs of white elephant projects in Iran during the 2000s, drawing insights from national budget bills. This analysis aims to demonstrate that the cost of white elephant projects, which is a form of clientelism, is high and squanders oil revenues, leading to more corruption.

Following the oil price shock in 1973, which resulted in a significant increase in the average annual OPEC crude oil price from \$1.82 per barrel in 1972 to \$2.7 in 1973 and \$11 in 1974, the Iranian government responded by establishing a new political party called the Rastakhiz party. This party was created with the intention of consolidating power and loyalty to the government.² Meanwhile, the influx of oil dollars had adverse effects on the crucial institutions necessary for development. The sharp increase in oil revenues led to a surge in the number of public investment projects. However, the Organization of Budgeting and Planning, responsible for allocating funds to these projects, became an obstacle for the Shah to finance them. The organization had implemented criteria, including feasibility studies, to assess the eligibility of public project financing. These conditions slowed the rapid allocation of oil revenues. Consequently, the Shah took measures to limit the power of this organization in the process of financing public investments to bypass hindrances and expedite the allocation of oil revenues into the projects.

Since its establishment in 1948, the agency played a crucial role in enhancing the decision-making process in Iran. It took on the responsibility of medium-term planning, contributing to the improvement of economic policies. Additionally, its collaboration with other newly created organizations, including the Central Bank established in 1959, further strengthened the level of economic policymaking in the country. These efforts resulted in higher levels of economic growth and lower inflation rates during the 1960s, suggesting that Iran had achieved a stable macroeconomic environment. However, the oil price shock disrupted the progress that was made over the course of two decades. The institutions that had been painstakingly built were dismantled, posing significant challenges to the economic stability and policymaking capabilities of the country.

Within 2–3 years following the oil shock, inflation levels soared to 12%, a significant increase compared to the previous levels of 5%; even lower prior to the oil price shock. This sudden surge in inflation was accompanied by the dismantling of economic institutions, the rise of authoritarianism, and a worsening of civil conflicts within the country.

As opposition to the government grew, certain political groups initiated armed struggles, resulting in an increasing number of people opposing the government. Political instability was evident even in the tenure of prime ministers. Amir-Abbas Hoveyda, Iran's longest-serving prime minister, held the position from 1965 until 1977. However, the succeeding prime ministers had significantly shorter tenures, with the next prime minister serving only 1 year and 20 days, and each subsequent prime minister lasting approximately 2 months. The final prime minister before the revolution in 1979 held the position for merely a month. This rapid turnover in prime ministers indicated the anticipation of a complete political regime change, leading governors to exploit public resources for personal gain (Campante et al., 2009). Consequently, corruption levels sharply increased, as depicted in Figure 1. Moreover, the heightened level of corruption demonstrated a direct correlation with increased internal conflicts (Farzanegan & Zamani, 2024).

Another oil price shock occurred in the 2000s, with average annual OPEC crude oil prices rising from \$28.1 per barrel in 2003 to \$50.59 in 2005 and \$94.1 in 2008. Although it experienced a decline in 2009 to \$60, prices sharply increased again, reaching around \$100 or more from 2011 to 2014. Similar to the oil price shock in the 1970s, this had detrimental effects on the quality of economic and political institutions in Iran.

Once again, the Organization of Budgeting and Planning was entrusted with the task of financing public investment projects. However, during Ahmadinejad's presidency (2005–2013), the administration was dissatisfied with the decision-making process of the organization,

particularly regarding the assessments of the feasibility studies for these projects. As a result, they restructured the organization, appointing one of Ahmadinejad's deputies to exert complete control to bypass the rules and procedures that were perceived as barriers to the government's allocation of oil rents.

Consequently, there was a significant increase in public investment projects, some of which remain unfinished. One notable example is the *Maskan Mehr* project, initiated during Ahmadinejad's government with the goal of providing housing for various segments of society. However, being a mega project, it was unable to be completed within his tenure. The subsequent president, Rohani, and his team did not prioritize the project for 8 years. Only in 2021 did the new government resume funding for the project, which still requires a significant amount of time to reach the operational phase. The *Maskan Mehr* project was launched in major cities across Iran, consuming a significant portion of oil revenues, and serves as a prime example of a white elephant project. It is important to note that projects like *Maskan Mehr* were designed to cater to the government's clients and support their interests, highlighting the clientelistic nature of such initiatives.

Similar to the oil price shock in the 1970s, the level of political stability declined once again. This instability even affected the longevity of ministers. For instance, Ahmadinejad dismissed his foreign affairs minister while the minister was in an official meeting in another country.³ He also openly challenged the Supreme Leader by refusing to accept the individual recommended by the supreme leader to be the minister of intelligence.⁴ It is worth noting that previous presidents, such as Khatami and Rafsanjani, did not possess the same capacity.

From a clientelism perspective, Ahmadinejad implemented a redistributive policy that involved providing monthly financial support to approximately 90% of the Iranian population.⁵ This policy continues to this day and proves challenging for subsequent presidents to dismantle. Additionally, he introduced *Saham Edalat* (Justice Shares), which involved distributing shares of state-owned companies to the public. However, due to the lack of transparency in the selection of board members for *Saham Edalat*, those appointed to the boards were often Ahmadinejad's political clients.⁶

As discussed in the previous section, the similarities between the phases of the Dutch disease and the situation in Iran are apparent. Inflation levels were increased, political instability was heightened, and there was a significant threat to political rights. Additionally, the decline in institutional quality and the erosion of democracy further contributed to the rise in corruption. Figure 1 illustrates that the highest level of corruption in our sample, spanning over half a century, occurred in 2012 during Ahmadinejad's presidency.

The response of both Ahmadinejad in the post-revolutionary period and the Shah in the pre-revolutionary period is strikingly similar (see Table 1). Both periods in Iran were characterized by the Dutch disease, high inflation, deindustrialization, institutional degradation, dependent capitalism, authoritarianism, nepotism, clientelism, and political instability. These factors collectively contributed to the increase in corruption. Although both pre- and post-revolution regimes are authoritarian, one was a dictatorship led by the Shah at the helm, while the other is a totalitarian regime with the Supreme Leader in power. Notably, in the Shah's era, the prime minister occupied the position of the head of government, while in the Islamic Republic, the president assumes the role. Neither the Pahlavi nor Islamic Republic paid sufficient attention to the long-term consequences of the oil price shocks. Instead, they prioritized short-term gains and attempted to compensate for Iran's historical backward development. However, in their pursuit of immediate benefits, they inadvertently undermined the sound economic institutions that are crucial for sustainable long-term economic development.

TABLE 1 Similar economic and political conditions of Iran in the 1970s and 2000s when it faced oil price shocks.

Indicators	Period		Notes
	1970s	2000s	
Oil price shock	✓	✓	<ul style="list-style-type: none"> Average annual OPEC crude oil prices increased from \$1.82 per barrel in 1972 to \$2.70 in 1973 and \$11.00 in 1974. Average annual OPEC crude oil prices increased from \$28.10 per barrel in 2003 to \$50.59 in 2005 and \$94.10 in 2008.
Suppression of main economic institutions	✓	✓	<ul style="list-style-type: none"> Both the Shah and Ahmadinejad undermined the accumulated experience of governance in major economic institutions, including the Organization of Budgeting and Management and the Central Bank.
Authoritarianism	✓	✓	<ul style="list-style-type: none"> Both the Shah and Ahmadinejad removed independent experts from senior-level management positions. Subsequently, ministers and their top managers endorsed the decisions of political power, despite being aware of their flawed nature. While both political regimes share authoritarian traits, one operated as a dictatorship under the leadership of the Shah, and the other operates as a totalitarian regime with the Supreme Leader in power. Moreover, in the Shah's era, the head of government was held by prime ministers, whereas in the Islamic Republic, the president takes on this role.
Clientelism in public sector	✓	✓	<ul style="list-style-type: none"> In both periods, the number of public employees increased.
Clientelism in public investment (white elephant)	✓	✓	<ul style="list-style-type: none"> The cost of white elephant projects in the 2000s amounted to approximately \$60 billion (see the next section). The national project of <i>Maskan Mehr</i> started during Ahmadinejad's tenure and is still not completed. Similarly, in the 1970s, numerous white elephant projects existed as all ministries undertook various public projects that could not be completed due to financing issues and difficulties in importing technology.
Clientelism in imports	✓	✓	<ul style="list-style-type: none"> In both periods, the government granted import privileges to individuals who were supporters of the government.
Militarism	✓	✓	<ul style="list-style-type: none"> Due to increasing political instability and a growing number of opponents, both governments relied more heavily on militias. In the 1970s, a senior militia member, General Gholam Reza Azhari, even became the prime minister. During Ahmadinejad's presidency, we observed an increasing influence of the revolutionary guard in political system.
Suppression of opponents	✓	✓	<ul style="list-style-type: none"> In the 1970s, a one-party system was established, and the government gave people two options: either join the party or leave the country. Similarly, in the 2000s, Ahmadinejad referred to opponents during the 2009 presidential election as "dust and trash."

(Continues)

TABLE 1 (Continued)

Indicators	Period		Notes
	1970s	2000s	
Political instability	✓	✓	• Political instability in the 1970s eventually culminated in the revolution of 1979. Similarly, in the 2000s, the level of political instability also increased.
Inflation	✓	✓	• Inflation increased in both periods: from 6.4% in 1971 to 27.3% in 1976, and from 10% in 2006 to 25.4% in 2008.
Direct distributive policy	✓	✓	• Ahmadinejad introduced <i>Saham Edalat</i> , which aimed to allocate shares of state-owned enterprises to the public, this policy continues today. In the 1970s, the government also implemented a food subsidy program in schools.
Procyclicality of fiscal policy	✓	✓	• In both periods (the 1970s and the 2000s), government expenditures increased during economic booms and decreased during stagnation.
Procyclicality of monetary policy	✓	✓	• In both periods (the 1970s and the 2000s), the money supply increased during economic booms.
Dutch disease	✓	✓	• In both periods, Iran experienced the Dutch disease and its consequences.
Sharp increase in corruption	✓	✓	• The highest levels of corruption in both the pre- and post-revolutionary periods occurred in the 1970s and 2000s.

The literature review reveals that countries facing the resource curse often exhibit short-term horizons. This characteristic was particularly evident during Ahmadinejad's lengthy presidency. While Khatami implemented measures such as the establishment of a stabilization fund for oil revenues as part of the Fourth Five-Year Development Plan, Ahmadinejad and his administration disregarded these rules following the shock in oil prices. This highlights the challenge of implementing international solutions to address the issues posed by the resource curse in resource-rich countries. Online Appendix A presents clientelism in public investment projects in Iran.

3 | METHODOLOGY AND DATA

3.1 | Methodology

To examine how the CRI responds to a positive shock in oil rents, we employ a vector autoregressive (VAR) model. Lütkepohl (2011) and Sims (1980, 1986) explain the advantages of the VAR approach in policymaking when the variables are endogenous.

We utilize the ordinary least squares (OLS) method to estimate the reduced form:

$$Y_t = g_0 + G_1 Y_{t-1} + G_2 Y_{t-2} + \dots + G_p Y_{t-p} + e_t, \quad (1)$$

where Y_t , which is a vector of endogenous variables, depends on its own lags and the lags of other endogenous variables. Given that the variable ordering can impact post-VAR estimations for the impulse response analysis (IRF), we adopt the generalized IRF (GIRF) approach

introduced by Pesaran and Shin (1998). This allows us to present generalized IRFs that remain unaffected by the variable ordering within the VAR model.

Below, we explain the endogenous variables included in the VAR estimation. Our primary variables of interest are the CRI and oil rents. However, we also account for other potential channels through which the impact of an oil rents shock can be transmitted to corruption in Iran.

Our key hypothesis suggests that, *ceteris paribus*, the response of corruption to a positive shock in oil rents per capita is expected to be positive and statistically significant.

3.2 | Data

Corruption reflection index (CRI): The CRI is a news-based index introduced by Farzanegan and Zamani (2024) to measure the reflection of corruption in Iran. Drawing inspiration from the methodologies of Dincer and Johnston (2017) and Dincer and Teoman (2019), we faced the challenge of creating a comprehensive CRI for Iran spanning an extended time frame. To address this need, we carefully selected Ettelā'āt newspaper, renowned as one of the oldest daily newspapers in Iran since its establishment in 1926.⁷ Covering a spectrum of economic, social, and political topics, Ettelā'āt was deemed ideal for capturing both pre- and post-revolutionary periods. Accessing data from Ettelā'āt's archive is a meticulous process. The archive, which is stored in compact discs (CDs), organizes data monthly, with each CD dedicated to a specific month. For instance, a single year may comprise 12 CDs, each covering a respective month. Navigating this extensive archive involved scrutinizing each CD individually. The digitization process converted scanned pages into portable document formats, making it challenging to employ text analysis software for efficient data extraction from images of newspaper pages. Instead, we resorted to a labor-intensive method, inspecting each CD page by page to identify corruption-related news.

To carry out this task, we initiated the process by selecting the first day of each month (if the newspaper was printed) within a CD. Each page for the chosen day was carefully examined for corruption-related news content. This iterative process entailed going through each page, scrutinizing the entirety of the CD. The procedure was then repeated for subsequent days, with us conducting a thorough review for each CD to analyze the newspaper's coverage of corruption or related terms.

Despite the time-consuming nature of this methodology, it was the sole viable approach for extracting the required data. Prior to commencing this process, we engaged with the Ettelā'āt office in Tehran, confirming the necessity of navigating the archive manually.

Following the methodologies outlined by Dincer and Johnston (2017) and Dincer and Teoman (2019), Farzanegan and Zamani (2024) conducted an in-depth search for Persian news content related to corruption, including “سالتخا”, “موشر”, “داسف”, and “یرادرب‌هالک” (Persian equivalents for the words “corruption,” “bribe,” “embezzlement,” and “fraud”).

To establish criteria for the inclusion of news cases for the CRI, Farzanegan and Zamani (2024) implemented the following guidelines:

1. They focused exclusively on the public sector, excluding coverage of corruption in the private sector.
2. Corruption cases related to non-profit organizations in Iran were included due to their direct and indirect connections with the government.

3. Unverified references to corruption in political slogans and statements of political rival groups were not considered.
4. Corruption not linked to economic or financial issues (such as references to moral corruption in society) was excluded.

Table B1 in the online Appendix B provides a breakdown of the components of the CRI for Iran. For each year, the number of stories related to “corruption,” “bribe,” “embezzlement,” and “fraud” is detailed. Notably, the data in this appendix reveals that from 1962 to 1990, both “bribe” and “fraud” related news were the most featured ones in Ettelā’āt newspaper. However, post-1990, “corruption” and “embezzlement” garnered more extensive coverage in this media outlet. Additionally, Table B2 in the online Appendix B displays the deflated CRI, which has been adjusted for the number of relevant pages covering political and economic issues.

Figure 1 illustrates the development of the CRI in Iran from 1962 to 2019. Examining the graph reveals three distinct spikes in the CRI. The first surge traces back to the last 5 years preceding the revolution (1979). During this period, oil revenues experienced a sharp increase from 1974, coupled with a simultaneous rise in political instability from 1976.

The second notable increase in the CRI coincides with the first term of Hashemi’s presidency (1989–1997), a period characterized by economic adjustment policies. The third significant upturn in the CRI begins in 2009 during Ahmadinejad government.

In a historical context, as depicted in Figure 1, corruption levels were initially high in the early 1960s. However, a marked decline ensued, extending through the mid-1970s, aligning with a phase of robust economic growth in Iran. Following the revolution, corruption levels decreased for a decade but resurged during Hashemi’s presidency. Subsequently, during Khatami’s presidency, corruption decreased again, only to rise once more during the presidencies of Ahmadinejad and Rouhani.

We also examine our estimations using alternative corruption indicators from the V-Dem (Varieties of Democracy) database published by the V-Dem Institute at the University of Gothenburg. V-Dem has developed innovative methods for aggregating expert judgments in a way that produces valid and reliable estimates of difficult-to-observe concepts such as corruption. As indicated on the project’s website,⁸ the experts are typically academics or professionals with specialized and well-substantiated expertise in one or more specific fields. Approximately two-thirds are either citizens or residents of the country for which they provide information. V-Dem employs a Bayesian item-response theory estimation strategy to convert the ordinal responses provided by experts into continuous estimates of the concepts being measured.⁹ Within the V-Dem dataset, there are several variables related to corruption: regime corruption (v2xnp_regcorr), political corruption index (v2x_corr), executive corruption index (v2x_execorr), and public sector corruption index (v2x_pubcorr). All of the variables fall within a range of 0 to 1, with higher values indicating a higher level of corruption. For further details, refer to (Coppedge et al., 2023).

There is a statistically significant correlation between the CRI (news-based) and the aforementioned V-Dem corruption variables. The correlation coefficients are presented in Table 2. While both corruption indexes are useful for illustrating the development of corruption in Iran over time, they also have their own drawbacks. The news-based corruption index may be susceptible to the degree of government influence on the coverage of corruption cases and the absence of a free press, both under the monarchy and Islamic Republic regimes. The V-Dem corruption index, relying on expert assessment, may be biased due to its inherent subjectivity (see, e.g., Olken, 2009; Gutmann et al., 2020; Pittaluga et al., 2023). Hence, these caveats should be taken into consideration when interpreting the results.

Oil revenues per capita: This variable represents the value of petroleum exports divided by the total population and is measured in US dollars. The data for this variable is sourced from the Organization of the Petroleum Exporting Countries Annual Statistical Bulletin (OPEC, 2023). Figure 2 shows the development of this variable in our period of analysis.

GDP growth rate: This variable represents the real GDP growth rates based on purchasing power parity (PPP) weights and is expressed as a percentage. The data for this variable is sourced from OPEC (2023). The aggregates are compiled by OPEC using GDP weights from 2017 and purchasing power parities from 2017. Figure 3 depicts the trend of this variable since 1962.

Inflation rate (%): Inflation, as measured by the consumer price index (CPI), represents the annual percentage change in the cost of a basket of goods and services typically purchased by

TABLE 2 Correlation between CRI and V-Dem corruption variables (1962–2019) in Iran.

	Corruption reflection (CRI)	v2x_corr	v2x_execorr	v2x_pubcorr	v2xnp_regcorr
Corruption reflection	1				
v2x_corr	0.55 (4.88)	1			
v2x_execorr	0.51 (4.40)	0.74 (8.32)	1		
v2x_pubcorr	0.54 (4.79)	0.98 (42.43)	0.68 (7.01)	1	
v2xnp_regcorr	0.56 (5.10)	0.95 (21.89)	0.92 (17.22)	0.90 (15.80)	1

Note: *t* statistics are in parentheses.

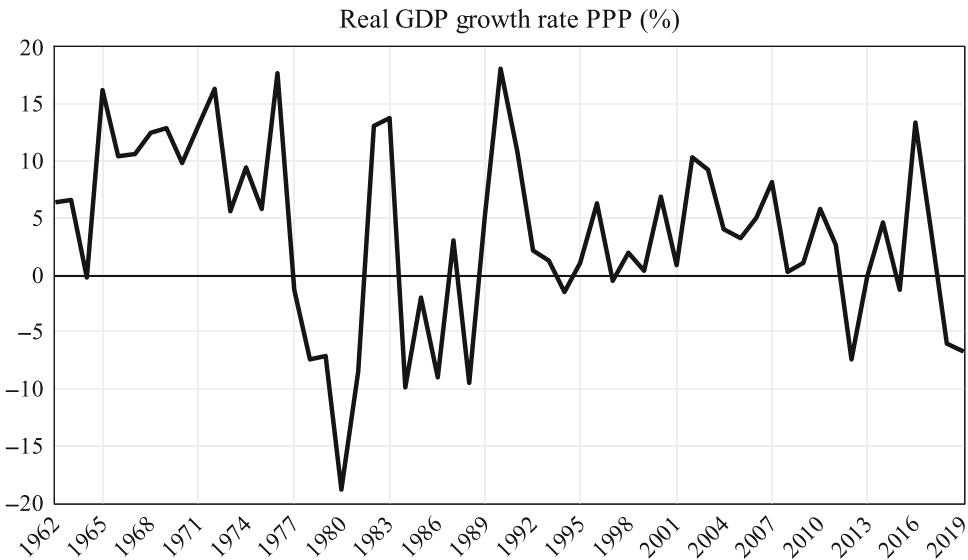


FIGURE 3 Real GDP growth rate in Iran.

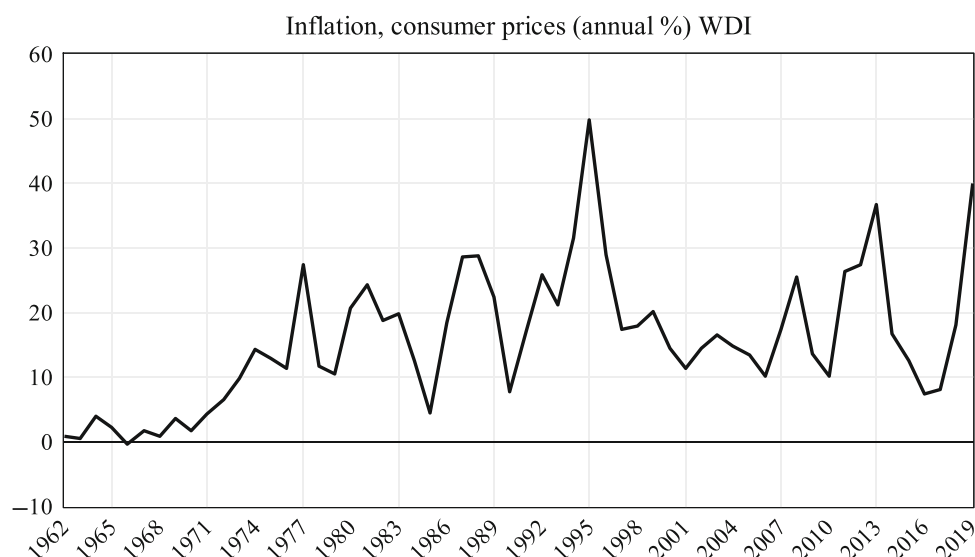


FIGURE 4 Inflation in Iran.

the average consumer. This basket may contain both fixed and variable items, with specified intervals for revision, such as annually. The data for this variable is sourced from the World Bank (2023). Figure 4 shows its development.

Military spending (as % of GDP): Military expenditure data from the Stockholm International Peace Research Institute (SIPRI) is obtained based on the definition provided by the North Atlantic Treaty Organization (NATO). This definition encompasses current and capital expenditures on armed forces, including peacekeeping forces, defense ministries, government agencies involved in defense projects, paramilitary forces if they are deemed trained and equipped for military operations, and military space activities. The data for this variable is sourced from the World Bank (2023). Figure 5 illustrates its evolution since 1962.

Political institutions: We utilize a measure of democratic institutions obtained from the V-Dem Dataset. The dataset also encompasses various indicators reflecting the quality of democratic institutions. In our main estimation, we focus on the liberal democracy index. According to V-Dem, this index emphasizes the importance of safeguarding individual and minority rights against both state and majority tyranny. The liberal model adopts a “negative” perspective on political power by evaluating the quality of democracy based on the constraints imposed on the government. This is achieved through constitutionally protected civil liberties, a robust rule of law, an independent judiciary, and effective checks and balances that limit executive authority. To capture the measure of liberal democracy, the index also considers the level of electoral democracy. For more detailed information, please refer to Coppedge et al. (2023). Figure 6 illustrates the development of this index in Iran.

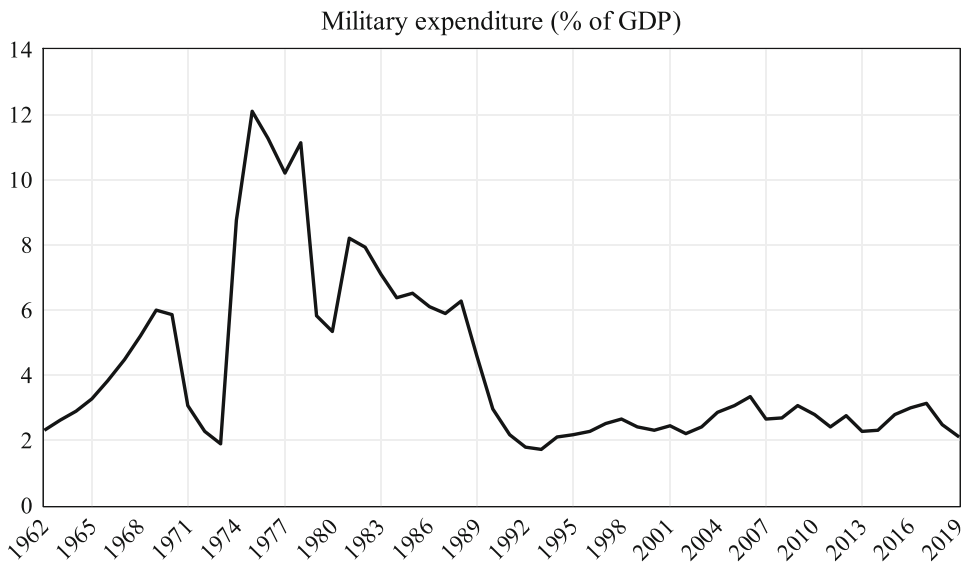


FIGURE 5 Military expenditure (percent of GDP) in Iran.

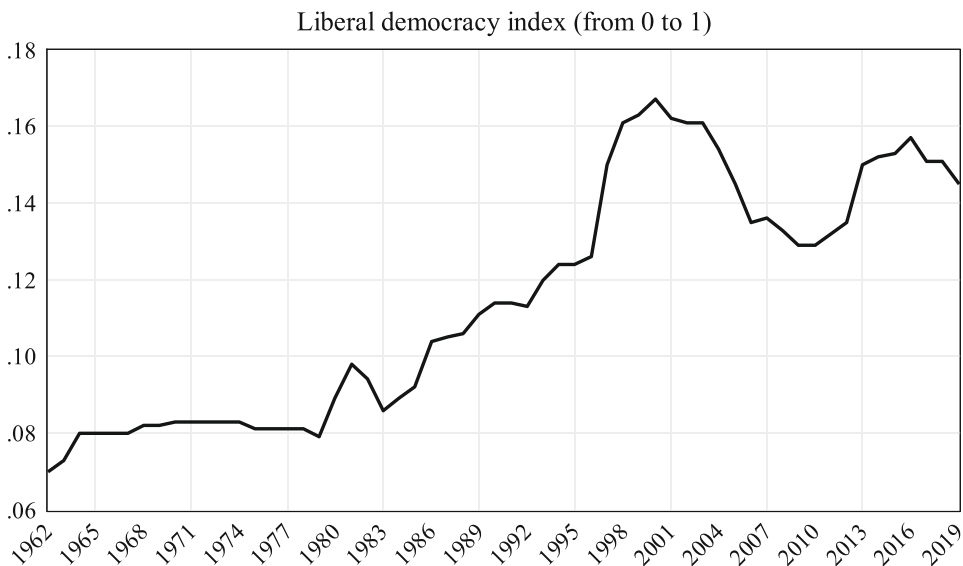


FIGURE 6 Liberal democracy index in Iran and its summary statistics.

4 | RESULTS

4.1 | Response of corruption to oil rent shocks

In order to estimate the VAR model, several steps need to be taken. First, the optimal lag length must be determined. Next, the stationarity of the estimated VAR model needs to be checked and must confirm that the estimated VAR model does not exhibit residual autocorrelation at the chosen lag lengths. The results of the lag length selection are presented in Table C1 in the

online Appendix C. Based on different statistical criteria, a lag length of 1 is selected to estimate the VAR model.

Ensuring the stability (stationarity) of the estimated VAR model is crucial, as it determines the validity of critical results, such as the estimated confidence intervals for impulse responses (IHS Markit, 2020). According to Lütkepohl (2007), the overall stationarity condition of a VAR model holds greater significance than the stationarity of the individual series.¹⁰ Consistent with prior research, we estimate our VAR model using the levels of variables, as the stability condition confirms the stationarity and stability of the entire model (see Figure C1 in the online Appendix C, showing that no roots lie outside of circle). Previous studies also employ variable levels, particularly when the emphasis is on interpreting impulse responses (Dizaji et al., 2016; Farzanegan & Markwardt, 2009; Farzanegan & Zamani 2024; Sims, 1992; Sims et al., 1990).

Furthermore, the estimated VAR model exhibits no residual correlation at the chosen lag length of one. This is confirmed by the Lagrange Multiplier (LM) test for autocorrelation, as shown in Table C2 in the online Appendix C. The p-value of 0.12 suggests that we cannot reject the null hypothesis of no residual autocorrelation at the lag of one.

Since there are no concerns regarding the stability and specification of the estimated VAR model, we proceed to calculate the generalized impulse response functions. The shock variable in our analysis is the logarithm of oil rents per capita, while our primary response variable is the logarithm of the CRI (while controlling for other relevant variables).¹¹

The outcome of the IRF analysis can be affected by the ordering of variables within the VAR system. To mitigate this concern, we employ the Generalized IRF (GIRFs) solution proposed by Pesaran and Shin (1998) which is not influenced by the specific variable ordering. In accordance with Sims and Zha (1999) and Stock and Watson (2001), we provide confidence interval bands at the 68% level for the estimated impulses. These error bands are constructed using Kilian's unbiased bootstrap method. Kilian's unbiased confidence interval, as introduced Kilian (1998), is a bootstrap interval approach that corrects for bias and skewness in the impulse response estimator. This correction is particularly relevant when dealing with smaller sample sizes.

Figure 7 demonstrates that the CRI displays a positive response to a positive shock in oil rents in Iran. An unexpected increase in oil rents, such as through positive oil price shocks or increased oil exports following the lifting of sanctions, leads to elevated levels of corruption, as reflected in one of Iran's main media outlets. The peak of corruption responses is observed during the second and third year following the oil shock. The positive and statistically significant impact of oil shocks on corruption persists for up to 7 years after the initial shock. Oil booms serve as a conducive environment for corruption to thrive in Iran. We further scrutinize this response by adjusting the CRI through various metrics, including normalization by the total number of daily Ettela'at Newspaper pages, the number of relevant pages (specifically political and economic pages) within the daily Ettela'at Newspaper, and the number of relevant pages for each year (refer to Table B2 in the online Appendix B). The deflated CRI's reaction to a positive shock in oil rents is visualized in Figure B1. Notably, the primary observation from Figure 7 remains consistent even after these adjustments.

4.2 | Potential mechanisms: What are the possible mechanisms for increasing corruption following oil booms?

4.2.1 | Inflation

One potential mechanism through which positive oil income shocks can contribute to an increase in corruption is through the inflation rate. The concept of the Dutch disease hypothesis

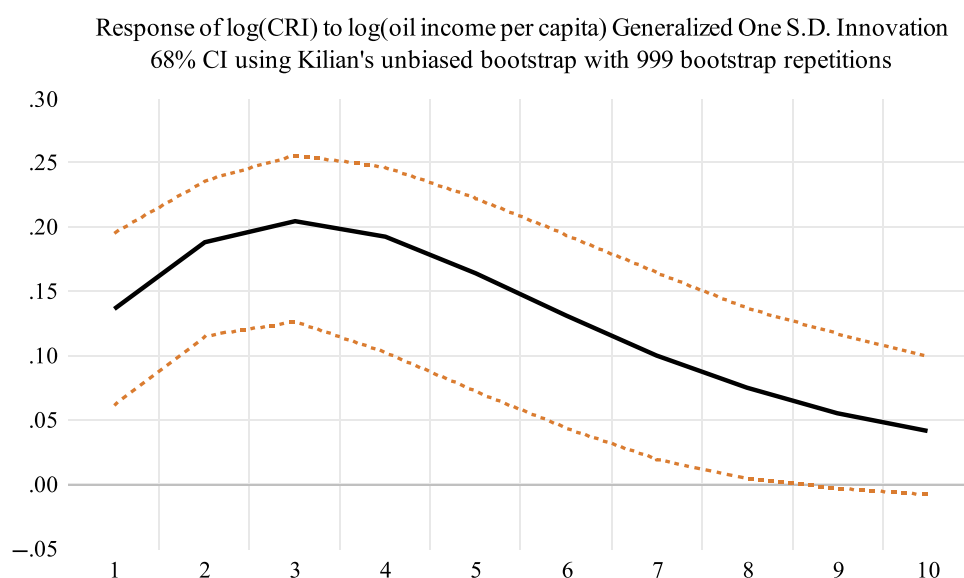


FIGURE 7 Response of log(CRI) to log(oil income per capita) shock. [Colour figure can be viewed at wileyonlinelibrary.com]

helps to explain the inflationary environment that arises because of unexpected positive changes in oil rents. As oil rents increase, the government tends to allocate more spending toward both tradable and non-tradable goods. However, due to supply constraints, this leads to higher prices in the non-tradable sector. Is there evidence for a positive response of inflation to positive oil shocks in Iran, based on history of the data from 1962 to 2019?

In Figure 8, we observe a positive response of the inflation rate to a positive shock in oil income per capita. The response reaches its peak in approximately the fourth year after the shock. Additionally, the positive response remains statistically significant between the fourth and seventh years after the shock.

How does corruption respond to a positive change in inflation following oil booms?

The response of corruption to a positive shock in the inflation rate, as depicted in Figure 9, is positive and statistically significant in the second year following the shock. This implies that an inflationary environment resulting from a potential oil boom leads to an increase in reported cases of corruption, even when controlling for other variables in the estimation. Inflation can distort transparency in the pricing of goods and services and may incentivize the manipulation of invoices to generate higher profits in trade (Farzanegan, 2009). Additionally, higher inflation diminishes individual purchasing power, increasing the incentives for engaging in corrupt practices, such as accepting bribes in business interactions. The inflationary environment may also reduce the time horizon of individuals and policymakers, thereby diminishing incentives to consider the long-term detrimental consequences of corruption on development.

4.2.2 | Military spending

In autocratic countries, government spending tends to prioritize sectors that can protect the ruling establishment during crises. The military sector often benefits from increased oil export

Response of Inflation rate (%) to log(oil income per capita) Generalized One S.D. Innovation
68% CI using Kilian's unbiased bootstrap with 999 bootstrap repetitions

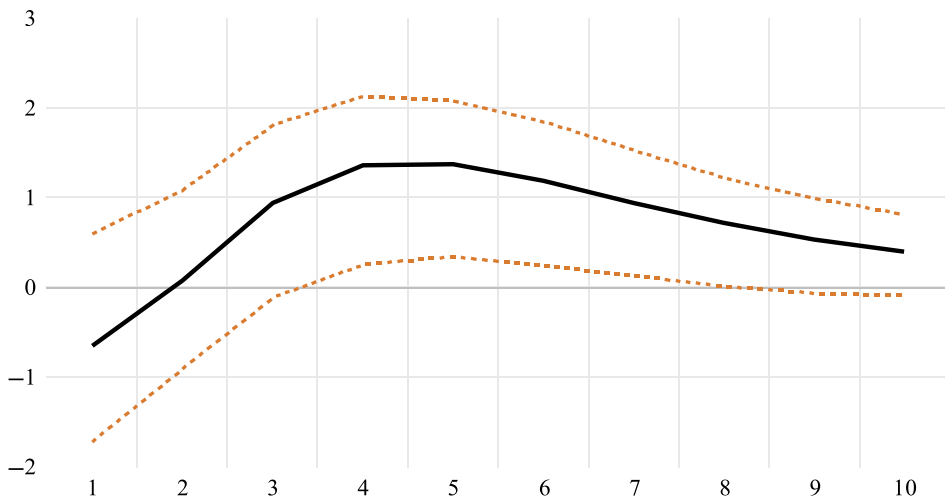


FIGURE 8 Response of inflation to log (oil income per capita) shock. [Colour figure can be viewed at wileyonlinelibrary.com]

Response of log(CRI) to Inflation rate Generalized One S.D. Innovation
68% CI using Kilian's unbiased bootstrap with 999 bootstrap repetitions

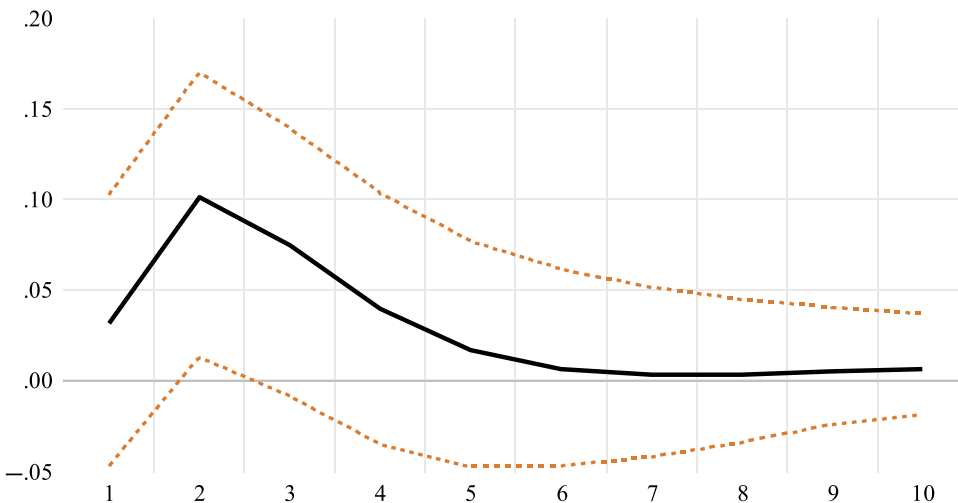


FIGURE 9 Response of log (CRI) to inflation rate shock. [Colour figure can be viewed at wileyonlinelibrary.com]

revenues, sometimes at the expense of the public education and health sectors, which have a greater impact on the population. However, in autocratic systems where the role of elections is weaker, the interests of the broader population become less significant. Instead, the interests of the military elite may take precedence over those of the rest of society (see Dizaji et al., 2016).

How does military spending in Iran respond to a positive shock in oil rents?

Response of military spending (% GDP) to log(oil income per capita) Generalized One S.D. Innovation
68% CI using Kilian's unbiased bootstrap with 999 bootstrap repetitions

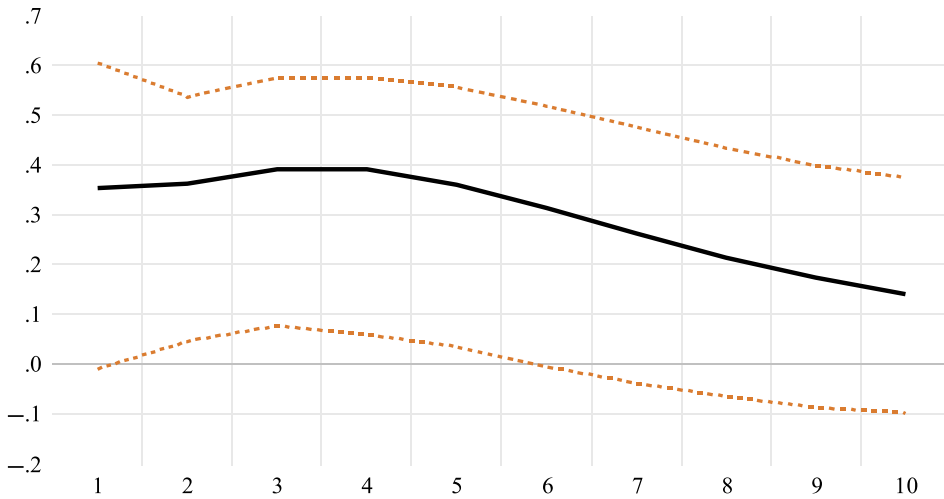


FIGURE 10 Response of military spending (% of GDP) to log (oil income per capita) shock. [Colour figure can be viewed at wileyonlinelibrary.com]

Figure 10 illustrates that in response to an oil boom, military spending exhibits a positive and significant trend for the initial 5 years after the shock. How does corruption respond to a positive shock in military pending? The military sector and its associated transactions are often characterized by a lack of transparency, creating a setting conducive to corrupt activities. There is a low risk of detection and the public has limited access to the contracts and agreements within the military sector. Additionally, the likelihood of misinvoicing trade documents is high, particularly for technologically-advanced and capital-intensive equipment. These factors contribute to an environment where corruption can thrive within the military sector.

As anticipated, the response of the CRI to a positive shock in military spending is positive and statistically significant within the first year after the shock (see Figure 11). However, the response tends to approach zero after the second year. It is possible that there are limitations in reporting corruption cases through the public media in Iran following a surge in militarization, which could contribute to the insignificant response of corruption reflection beyond the second year.

4.2.3 | Economic growth

The resource curse hypothesis pertains to the long-term adverse effects of resource dependency, particularly of point resources like oil, on the economic development of countries. In the short term, an oil boom may lead to increased investment and production. However, the management of oil rent distribution within the government budget, particularly in ethnically fractionalized countries, can exacerbate inequality (Farzanegan & Krieger, 2019), amplify corruption, and raise the risk of internal and external conflicts (Farzanegan et al., 2018). In our analysis, we initially explore the response of the real GDP growth rate to a positive shock in oil rents, considering history of data spanning approximately 60 years. By examining the dynamic relationship between our variables, we aim to gain insights into the impact of oil rents on economic growth.

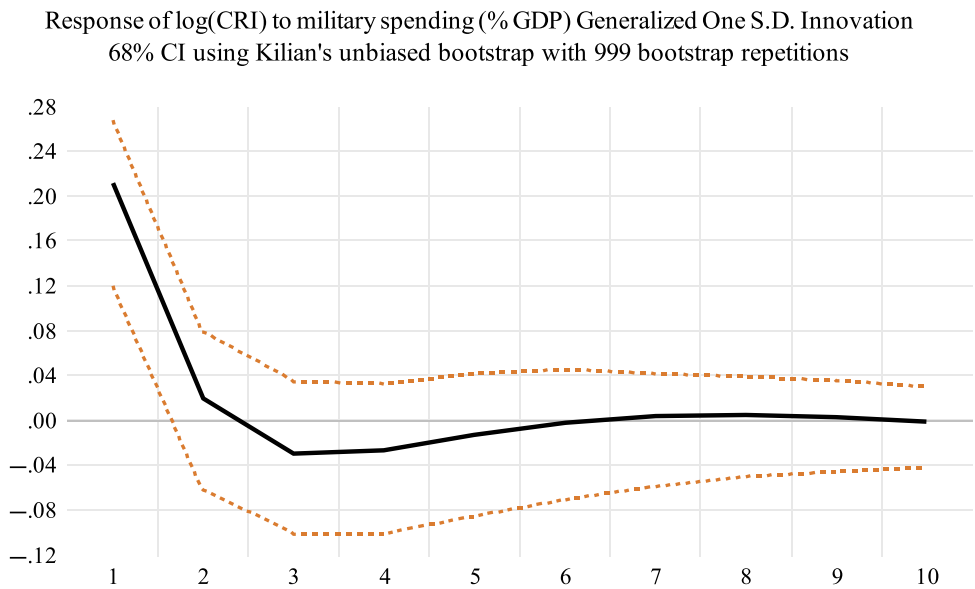


FIGURE 11 Response of log (CRI) to military spending (% of GDP) shock. [Colour figure can be viewed at wileyonlinelibrary.com]

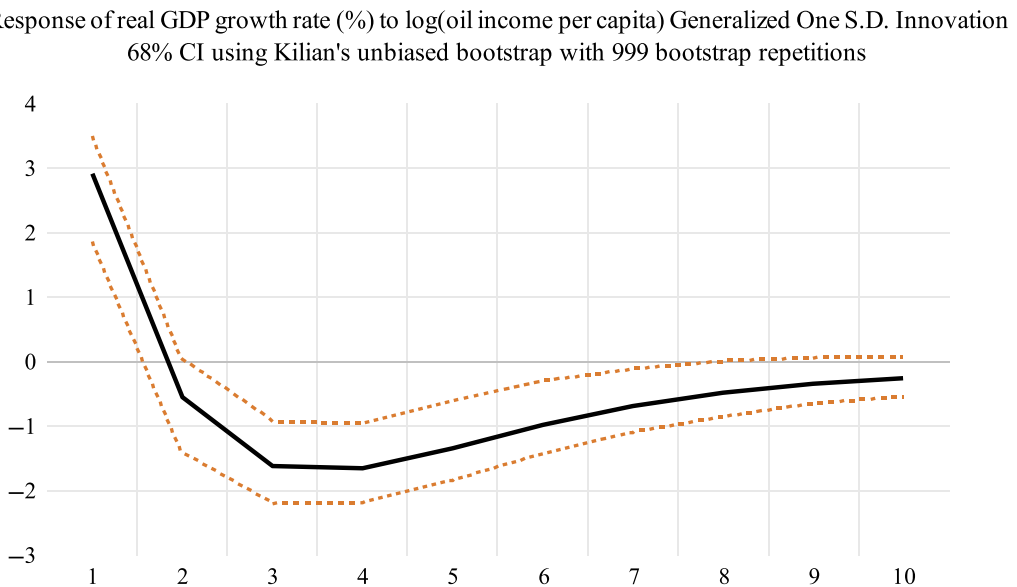


FIGURE 12 Response of real GDP growth rate (%) to log (oil income per capita) shock. [Colour figure can be viewed at wileyonlinelibrary.com]

According to Figure 12, we observe an immediate positive response in the real GDP growth rate following a positive shock in oil export revenues in Iran. This initial response is statistically significant. However, the positive response gradually declines and becomes negative and statistically significant between the second and seventh years after the initial shock. This negative

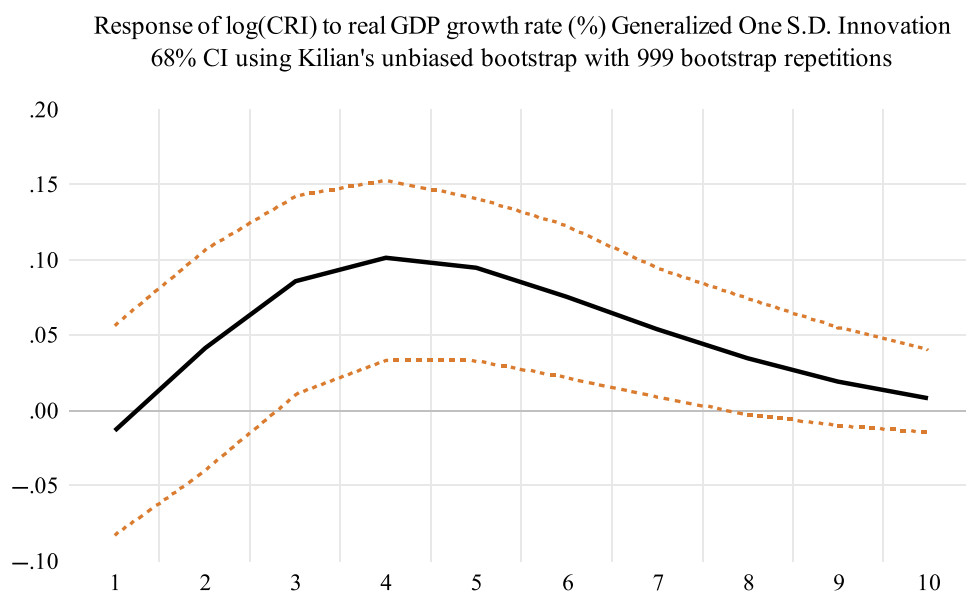


FIGURE 13 Response of log (CRI) to real GDP growth rate (%) shock. [Colour figure can be viewed at wileyonlinelibrary.com]

development in the real economy following an oil boom can be partly explained by the distortions outlined in the Dutch disease hypothesis, posing the following questions. What is the relationship between real economic growth and corruption in Iran? How does corruption respond to a positive shock in real economic growth? Do we see an improvement in the control of corruption because of higher state capacity in a growing economy and higher opportunity costs to engage in corruption? Or does a booming economy in an oil-based country open new rent-seeking opportunities, thus amplifying corruption in the presence of weak quality of institutions?

Based on Figure 13, we can observe that the response of our news-based CRI to a positive shock in real GDP growth is initially negative, although statistically insignificant. This weak evidence suggests that in an oil-based economy like Iran, a booming economy may lead to lower instances of corruption. This can be attributed to factors such as higher opportunity costs for economic agents to engage in corruption and an increased state capacity to control corruption.

However, in contrast to the initial negative response, we observe a subsequent positive response in corruption reflection in the media. This positive response becomes statistically significant between the third and seventh years after the positive shock in real GDP growth rate. This finding aligns with arguments suggesting that in countries with low-quality institutions, economic growth may create new opportunities for rent-seekers and consequently lead to an increase in corruption cases.

Part of the overall positive response of corruption to a positive shock in oil rents can be attributed to the short-term booming effect of oil rents on economic growth in Iran, which has been shown to be positively associated with corruption cases. This finding is in line with the research conducted by Farzanegan and Krieger (2019), who also demonstrate that oil booms, along with short-term economic growth, lead to higher income inequality in Iran. Based on their findings, we can argue that the opportunity cost of engaging in corrupt transactions

decreases, and ethical considerations regarding involvement in fraud, bribery, and embezzlement diminish as the gap between the rich and the poor widens. This can contribute to the observed increase in corruption following an oil boom.

4.2.4 | Quality of institutions

Increasing oil rents and an economic system's dependence on them can have detrimental effects on the financial independence of the state from the contributions of its citizens, such as taxes. This can potentially weaken democratic institutions. Strong democratic institutions play a crucial role in controlling corruption, as they promote a free media, the active participation of the people in the political process, and access to information and transparency. In the absence of robust democratic institutions, the risk of detecting corruption is low.

Oil booms may also contribute to the expansion of the middle class, as demonstrated by Farzanegan et al. (2021). The growth of the middle class is often associated with increased demand for political openness and reforms. However, as argued by Farzanegan et al. (2021), the middle class in Iran is financially dependent on the transfer of oil rents in various forms, such as through subsidies and public employment. Therefore, even with an expanded middle class, the likelihood of significant democratic openness and reforms may be limited. We examine the response of the quality of democratic institutions to a positive shock in oil rents.

As shown in Figure 14, the response of the liberal democracy index to a positive shock in oil rents is negative and statistically significant for the first 4 years after the shock. This finding aligns with our previous argument regarding the potential negative impact of increasing oil rents on democratic institutions.

How does the CRI respond to a positive shock in the quality of democratic institutions?

There is clear evidence of a negative response of corruption to a positive shock in the quality of democratic institutions, as shown in Figure 15. This negative response is statistically

Response of log(liberal democracy index) to log(oil income per capita) Generalized One S.D. Innovation
68% CI using Kilian's unbiased bootstrap with 999 bootstrap repetitions

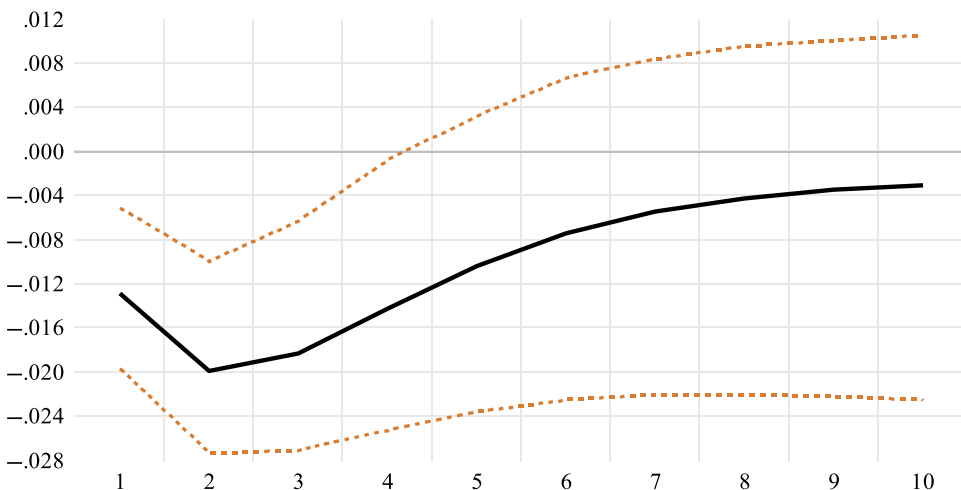


FIGURE 14 Response of log (liberal democracy) to log (oil income per capita) shock. [Colour figure can be viewed at wileyonlinelibrary.com]

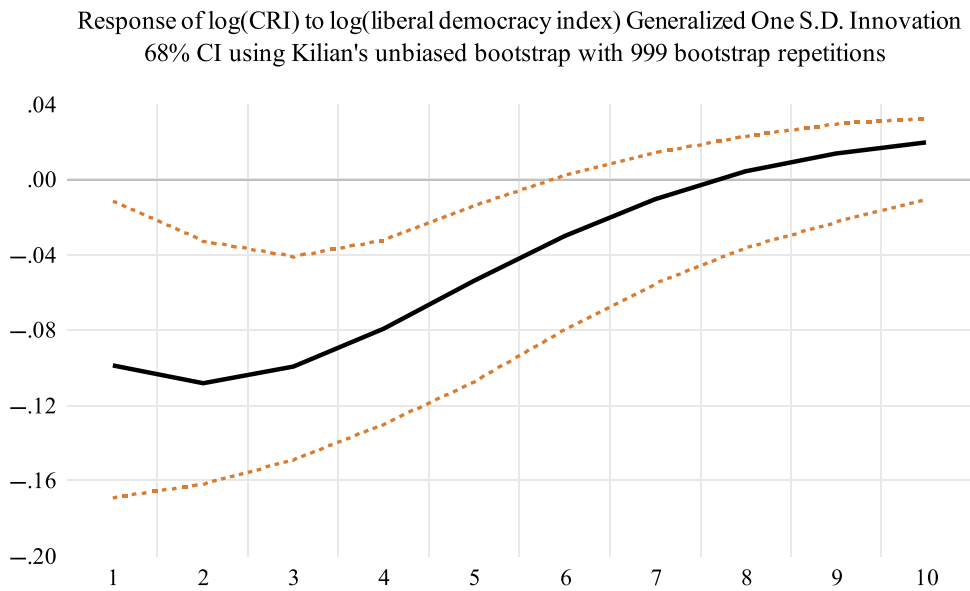


FIGURE 15 Response of log (CRI) to log (liberal democracy) shock. [Colour figure can be viewed at wileyonlinelibrary.com]

significant for the first 5 years after the shock. In particular, the decrease in corruption is most significant in the initial years after democratic openness in Iran.

Based on the results obtained, it can be concluded that oil booms negatively impact the quality of democratic institutions. Additionally, we demonstrate that the quality of democratic institutions is an important factor in reducing corruption. Therefore, one important transmission channel for the overall effect of an oil boom on corruption in Iran is through the quality of democratic institutions.

4.3 | Sensitivity checks

Do we observe a positive response of corruption to a positive shock in oil rents if we employ alternative measures of corruption? In this section, we replace the news-based index of corruption reflection, which was introduced in Farzanegan and Zamani (2024), with corruption indicators based on expert judgments introduced and estimated in the V-Dem project. We control for the same variables as we employed in the main analysis. Our overall results show that the response of the alternative indicators of corruption to a positive shock in oil rents in Iran is positive and statistically significant. Thus, our conclusion is not driven by a specific measure of corruption. The size of the effect obviously differs because of the various range of variables in the CRI and V-Dem based indicators. The CRI varies from 5 to 125 with a mean of 40 and a standard deviation of 29.6, while the corruption indicators in V-Dem range from 0 to 1.

4.3.1 | Political corruption index (v2x_corr)

This index covers a general question “How pervasive is political corruption?” The index is estimated by taking the average of the (a) public sector corruption index; (b) executive corruption

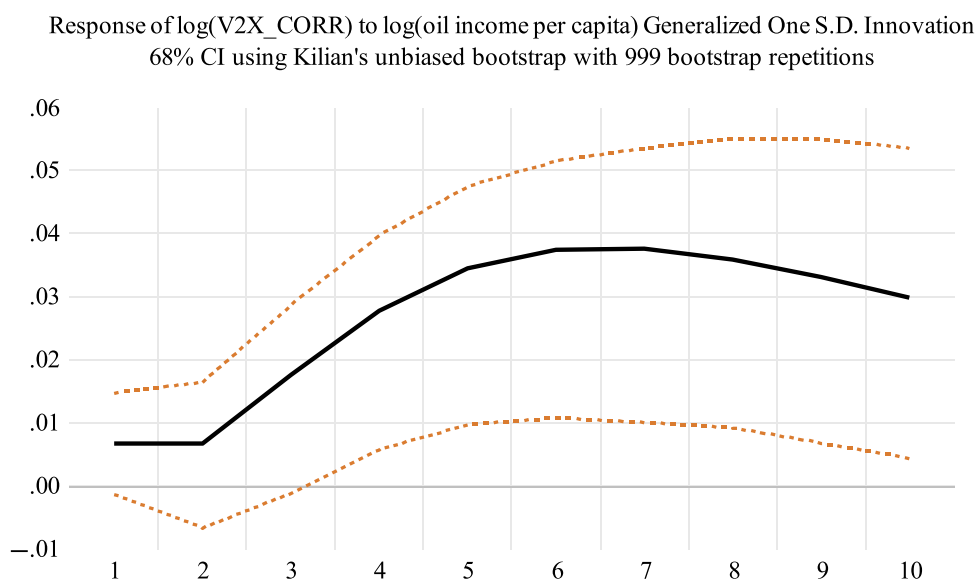


FIGURE 16 Response of $\log(\text{political corruption})$ to $\log(\text{oil rents per capita})$ shock. [Colour figure can be viewed at wileyonlinelibrary.com]

index; (c) the indicator for legislative corruption; and (d) the indicator for judicial corruption. In other words, these four different government spheres are weighted equally in the resulting index. V-Dem replaces missing values for countries with no legislature by only taking the average of a, b, and d.

We estimate the VAR model including $v2x_corr$ with optimum 1 year lag. The estimated VAR model satisfies the stability condition and has no residual serial correlation at the selected lag length. Therefore, we can safely proceed to the generalized impulse response analysis. The response of the political corruption index to a positive shock in oil rents per capita is shown in Figure 16. The response is positive and statistically significant from the 3rd to 10th years after the initial shock.

4.3.2 | Executive corruption index ($v2x_execorr$)

The executive corruption index aims to address the question “How routinely do members of the executive, or their agents grant favors in exchange for bribes, kickbacks, or other material inducements, and how often do they steal, embezzle, or misappropriate public funds or other state resources for personal or family use?” We re-estimate the VAR model including executive corruption instead of the political corruption index, keeping other variables in the system. Following the previous procedure results in a stable VAR estimation without any concern regarding residual serial correlation. The generalized impulse response is shown in Figure 17. We observe a statically significant and positive response of the executive corruption index to a positive shock in oil rents per capita for the entire 10 year period after the initial shock. The peak of the response is approximately 5 years after initial positive oil shock.

Response of $\log(V2X_EXECORR)$ to $\log(\text{oil income per capita})$ Generalized One S.D. Innovation
68% CI using Kilian's unbiased bootstrap with 999 bootstrap repetitions

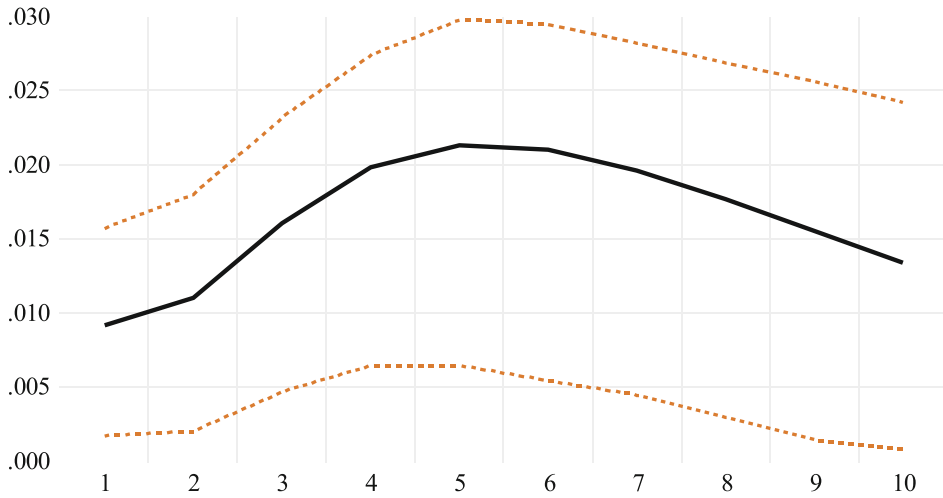


FIGURE 17 Response of $\log(\text{executive corruption})$ to $\log(\text{oil rents per capita})$ shock. [Colour figure can be viewed at wileyonlinelibrary.com]

Response of $\log(V2X_PUBCORR)$ to $\log(\text{oil income per capita})$ Generalized One S.D. Innovation
68% CI using Kilian's unbiased bootstrap with 999 bootstrap repetitions

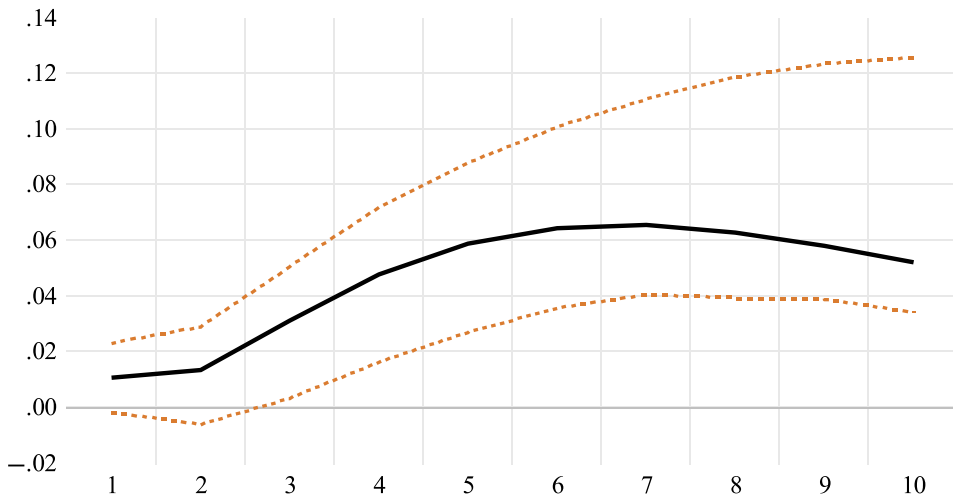


FIGURE 18 Response of $\log(\text{public sector corruption})$ to $\log(\text{oil rents per capita})$ shock. [Colour figure can be viewed at wileyonlinelibrary.com]

4.3.3 | Public sector corruption index ($v2x_pubcorr$)

Public corruption index aims to examine the expert judgments for the following question “To what extent do public sector employees grant favors in exchange for bribes, kickbacks, or other

Response of $\log(\text{V2XNP_REGCORR})$ to $\log(\text{oil income per capita})$ Generalized One S.D. Innovation
68% CI using Kilian's unbiased bootstrap with 999 bootstrap repetitions

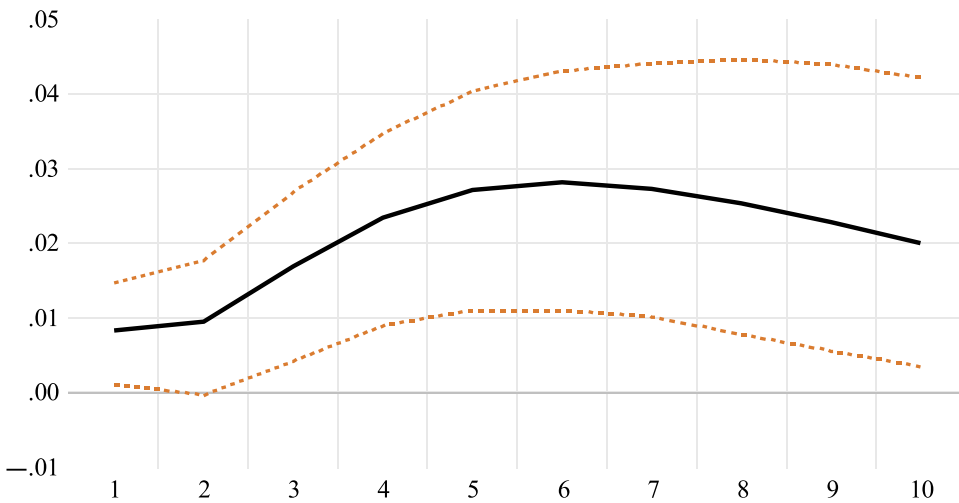


FIGURE 19 Response of $\log(\text{regime corruption})$ to $\log(\text{oil rents per capita})$ shock. [Colour figure can be viewed at wileyonlinelibrary.com]

material inducements, and how often do they steal, embezzle, or misappropriate public funds or other state resources for personal or family use?” Re-estimating the VAR model using this index with similar lag lengths as in the earlier cases and post-estimation satisfactory tests generate similar outcomes regarding the impulse response. The public sector corruption index responds positively and significantly to a positive oil rents shock. The generalized impulse response is shown in Figure 18.

4.3.4 | Regime corruption index (v2xnp_regcorr)

Under this category, answers regarding the following question are collected and an index for regime corruption is estimated: “To what extent do political actors use political office for private or political gain?” The index is formed by taking the reversed point estimates (i.e., higher scores = more regime corruption) from a Bayesian factor analysis model of the indicators for executive embezzlement, executive bribes, legislative corruption, and judicial corruption. The generalized impulse response shows a similar outcome with reference to a positive response of the regime corruption index to a positive shock in oil rents per capita. The results are shown in Figure 19.

We also propose replacing the measurement of the quality of democratic institutions with the internal conflict index, examining how corruption-oil rents nexus get affected by this sensitivity check. The discussion and results are presented in the online Appendix E.

5 | CONCLUSION

Our study examines the dynamic interactions between oil rents and corruption in Iran. Through the utilization of data spanning over the last 50 years, we explore the co-movement of

these two variables and examine the channels through which oil rent shocks may influence corruption. To accomplish this, we employ a news-based CRI introduced by Farzanegan and Zamani (2024) and apply a VAR model that treats all included variables as endogenous. We use a generalized impulse response function that is insensitive to the ordering of variables in the VAR model.

Our key finding reveals a positive and significant response of the CRI to a positive shock in oil income per capita in the years following the initial shock. We observe a consistent result when employing alternative measures of corruption, which are based on the subjective judgments of experts from the V-Dem project. This suggests that an oil boom exacerbates corruption in Iran. Furthermore, we explore the mechanisms through which the oil boom may contribute to increased corruption. Our analysis reveals that an oil boom in Iran can potentially lead to increased corruption levels through several channels. These channels include higher military spending, the degradation of democratic institutions, elevated inflation rates, and a temporary economic boom. In conclusion, our study sheds light on the intricate relationship between oil rents and corruption in Iran. The evidence demonstrates that an oil boom not only fuels corruption but also highlights the various pathways through which this influence is exerted.

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CONFLICT OF INTEREST STATEMENT

The authors report no interests, which may be perceived as posing a conflict or bias to the results reported in this paper.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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ENDNOTES

¹ For recent reviews of resource curse literature see De Soysa et al. (2022) and Alsharif and Bhattacharyya (2024).

² <https://www.nytimes.com/1975/03/03/archives/shah-decrees-iran-a-oneparty-nation.html>

³ <https://www.nytimes.com/2010/12/14/world/middleeast/14iran.html>

⁴ <https://www.reuters.com/article/us-iran-ahmadinejad-parliament-idUSBRE82D0NK20120314>

⁵ For an analysis of effects of such cash payments on inequality and poverty measures in Iran see Farzanegan and Habibpour (2017).

⁶ For a review of *Saham Edalat* see Farzanegan and Alaedini (2016).

⁷ <https://www.iranicaonline.org/articles/ettelaat>

⁸ <https://v-dem.net/about/v-dem-project/>

⁹ For more details on the methodology see <https://v-dem.net/about/v-dem-project/methodology/>

¹⁰ We also conducted standard unit root tests, specifically the Augmented Dickey–Fuller test, for the variables in our main specification. The results indicate that the natural logarithm of oil rents per capita, military spending

as a percentage of GDP, and the natural logarithm of the liberal democracy index are integrated of order 1 ($I(1)$), while other variables, such as the natural logarithm of the corruption reflection index, GDP per capita growth rate, and inflation, are integrated of order 0 ($I(0)$). To examine the cointegration relationship among the $I(1)$ variables, we conducted various tests, which confirmed the presence of one cointegrating relation (based on some of the tests types). To ensure the robustness of our analysis, we took the first difference of the $I(1)$ variables from our main specification and re-estimated the VAR model using an optimal lag of 1 year. This re-estimation passed both the stability condition and the post-estimation tests for residual autocorrelation. The impulse response analysis, which employs the first difference of the natural logarithm of oil exports per capita as the shock variable, yielded similar findings to our analysis using all variables at their original levels. Specifically, we observed a positive response of corruption to a positive shock in the growth rate of oil rents per capita. The unit root and cointegration tests are available upon request. Online Appendix D shows the results.

¹¹ In the sensitivity analysis, we also use V-DEM corruption variables instead of CRI.

REFERENCES

- Abman, R., & Longbrake, G. (2023). Resource development and governance declines: The case of the Chad–Cameroon petroleum pipeline. *Energy Economics*, 117, 106477. <https://doi.org/10.1016/j.eneco.2022.106477>
- Ades, A., & Di Tella, R. (1999). Rents, competition, and corruption. *American Economic Review*, 89(4), 982–993. <https://doi.org/10.1257/aer.89.4.982>
- Ali, H. E., & Solarin, S. A. (2020). Military spending, corruption, and the welfare consequences. *Defence and Peace Economics*, 31(6), 677–691. <https://doi.org/10.1080/10242694.2019.1567181>
- Alsharif, N., & Bhattacharyya, S. (2024). Oil discovery, boom-bust cycle and manufacturing slowdown: Evidence from a large industry level dataset. *Review of Development Economics*, 28(2), 406–431. <https://doi.org/10.1111/rode.13063>
- Amuzegar, L., & Fekrat, M. A. (1971). *Iran: Economic development under dualistic conditions*. The University of Chicago Press. <https://www.cabdirect.org/cabdirect/abstract/19721891510>
- Bhattacharyya, S., & Hodler, R. (2010). Natural resources, democracy and corruption. *European Economic Review*, 54(4), 608–621. <https://doi.org/10.1016/j.eurocorev.2009.10.004>
- Bjorvatn, K., & Farzanegan, M. R. (2015). Resource rents, balance of power, and political stability. *Journal of Peace Research*, 52(6), 758–773.
- Bjorvatn, K., Farzanegan, M. R., & Schneider, F. (2012). Resource curse and power balance: Evidence from oil-rich countries. *World Development*, 40(7), 1308–1316. <https://doi.org/10.1016/j.worlddev.2012.03.003>
- Campante, F. R., Chor, D., & Do, Q.-A. (2009). Instability and the incentives for corruption. *Economics and Politics*, 21(1), 42–92. <https://doi.org/10.1111/j.1468-0343.2008.00335.x>
- Caselli, F., & Cunningham, T. (2009). Leader behaviour and the natural resource curse. *Oxford Economic Papers*, 61(4), 628–650. <https://doi.org/10.1093/oep/gpp023>
- Collier, P., & Hoeffler, A. (2004). Greed and grievance in civil war. *Oxford Economic Papers*, 56(4), 563–595. <https://doi.org/10.1093/oep/gpf064>
- Collier, P., & Hoeffler, A. (2005). Resource rents, governance, and conflict. *Journal of Conflict Resolution*, 49(4), 625–633. <https://doi.org/10.1177/0022002705277551>
- Coppedge, M., Gerring, J., Knutsen, C., Lindberg, S., Teorell, J., Alizada, N., Altman, D., Angiolillo, F., Bernhard, M., Borella, C., Cornell, A., Fish, M. S., Fox, L., Gastaldi, L., Gjerløw, H., Glynn, A., God, A. G., Grahn, S., Hicken, A., ... Ziblatt, D. (2023). V-Dem [country-year/country-date] dataset v13 varieties of democracy (V-Dem) project [dataset]. V-Dem Institute. <https://doi.org/10.23696/vdemds23>
- De Soysa, I., Krieger, T., & Meierrieks, D. (2022). Oil and property rights. *Resources Policy*, 79, 103069. <https://doi.org/10.1016/j.resourpol.2022.103069>
- Dincer, O., & Johnston, M. (2017). Political culture and corruption issues in state politics: A new measure of corruption issues and a test of relationships to political culture. *Publius: The Journal of Federalism*, 47, 131–148.
- Dincer, O., & Teoman, O. (2019). Does corruption kill? Evidence from half a century infant mortality data. *Social Science & Medicine*, 232, 332–339. <https://doi.org/10.1016/j.socscimed.2019.05.017>
- Dizaji, S. F., Farzanegan, M. R., & Naghavi, A. (2016). Political institutions and government spending behavior: Theory and evidence from Iran. *International Tax and Public Finance*, 23(3), 522–549. <https://doi.org/10.1007/s10797-015-9378-8>

- Farzanegan, M. R. (2009). Illegal trade in the Iranian economy: Evidence from a structural model. *European Journal of Political Economy*, 25(4), 489–507. <https://doi.org/10.1016/j.ejpoleco.2009.02.008>
- Farzanegan, M. R. (2022). The economic cost of the Islamic revolution and war for Iran: Synthetic counterfactual evidence. *Defence and Peace Economics*, 33, 129–149. <https://doi.org/10.1080/10242694.2020.1825314>
- Farzanegan, M. R., & Alaedini, P. (2016). *Economic welfare and inequality in Iran*. Palgrave Macmillan US. <https://doi.org/10.1057/978-1-349-95025-6>
- Farzanegan, M. R., Alaedini, P., Azizimehr, K., & Habibpour, M. M. (2021). Effect of oil revenues on size and income of Iranian middle class. *Middle East Development Journal*, 13(1), 27–58. <https://doi.org/10.1080/17938120.2021.1898232>
- Farzanegan, M. R., & Habibpour, M. M. (2017). Resource rents distribution, income inequality and poverty in Iran. *Energy Economics*, 66, 35–42. <https://doi.org/10.1016/j.eneco.2017.05.029>
- Farzanegan, M. R., & Krieger, T. (2019). Oil booms and inequality in Iran. *Review of Development Economics*, 23(2), 830–859. <https://doi.org/10.1111/rode.12569>
- Farzanegan, M. R., Lessmann, C., & Markwardt, G. (2018). Natural resource rents and internal conflicts: Can decentralization lift the curse? *Economic Systems*, 42(2), 186–205. <https://doi.org/10.1016/j.ecosys.2017.05.009>
- Farzanegan, M. R., & Markwardt, G. (2009). The effects of oil price shocks on the Iranian economy. *Energy Economics*, 31(1), 134–151. <https://doi.org/10.1016/j.eneco.2008.09.003>
- Farzanegan, M. R., & Thum, M. (2020). Does oil rents dependency reduce the quality of education? *Empirical Economics*, 58, 1863–1911.
- Farzanegan, M. R., & Witthuhn, S. (2017). Corruption and political stability: Does the youth bulge matter? *European Journal of Political Economy*, 49, 47–70. <https://doi.org/10.1016/j.ejpoleco.2016.12.007>
- Farzanegan, M. R., & Zamani, R. (2024). The effect of corruption on internal conflict in Iran using newspaper coverage. *Defence and Peace Economics*, 35(1), 24–43. <https://doi.org/10.1080/10242694.2022.2108571>
- Fearon, J. D. (2005). Primary commodity exports and civil war. *Journal of Conflict Resolution*, 49(4), 483–507.
- Gupta, S., de Mello, L., & Sharan, R. (2001). Corruption and military spending. *European Journal of Political Economy*, 17(4), 749–777. [https://doi.org/10.1016/S0176-2680\(01\)00054-4](https://doi.org/10.1016/S0176-2680(01)00054-4)
- Gutmann, J., Padovano, F., & Voigt, S. (2020). Perception vs. experience: Explaining differences in corruption measures using microdata. *European Journal of Political Economy*, 65, 101925. <https://doi.org/10.1016/j.ejpoleco.2020.101925>
- Gylfason, T. (2001). Natural resources, education, and economic development. *European Economic Review*, 45(4), 847–859. [https://doi.org/10.1016/S0014-2921\(01\)00127-1](https://doi.org/10.1016/S0014-2921(01)00127-1)
- IHS Markit. (2020). *EViews 12 user's guide II*. <https://www.eviews.com>
- Ishak, P. W., & Farzanegan, M. R. (2022). Oil price shocks, protest, and the shadow economy: Is there a mitigation effect? *Economics & Politics*, 34(2), 298–321. <https://doi.org/10.1111/ecpo.12199>
- James, A., & Rivera, N. M. (2022). Oil, politics, and “Corrupt Bastards”. *Journal of Environmental Economics and Management*, 111, 102599. <https://doi.org/10.1016/j.jeeem.2021.102599>
- Kilian, L. (1998). Small-sample confidence intervals for impulse response functions. *Review of Economics and Statistics*, 80, 218–230. <https://doi.org/10.1162/003465398557465>
- Lütkepohl, H. (2007). *New introduction to multiple time series analysis*. Springer Science & Business Media.
- Lütkepohl, H. (2011). *Vector autoregressive models*(Economics Working Paper ECO2011/30). European University Institute. https://econpapers.repec.org/paper/euieuiwps/eco2011_2f30.htm
- Mahdavy, H. (1970). Patterns and problems of economic development in rentier states: The case of Iran. In *Studies in the economic history of the Middle East* (pp. 428–467). Routledge.
- Matallah, S. (2022). Rampant corruption: The dilemma facing economic diversification in oil-abundant MENA countries. *Resources Policy*, 75, 102541. <https://doi.org/10.1016/j.resourpol.2021.102541>
- Mauro, P. (1995). Corruption and growth. *The Quarterly Journal of Economics*, 110(3), 681–712. <https://doi.org/10.2307/2946696>
- Olken, B. A. (2009). Corruption perceptions vs. corruption reality. *Journal of Public Economics*, 93(7), 950–964. <https://doi.org/10.1016/j.jpubeco.2009.03.001>
- OPEC. (2023). *Annual Statistical Bulletin 2022*. <https://asb.opec.org/index.html>
- Pesaran, H. (1982). The system of dependent capitalism in pre- and post-revolutionary Iran. *International Journal of Middle East Studies*, 14(4), 501–522. <https://doi.org/10.1017/S0020743800052181>
- Pesaran, H., & Shin, Y. (1998). Generalized impulse response analysis in linear multivariate models. *Economics Letters*, 58(1), 17–29. [https://doi.org/10.1016/S0165-1765\(97\)00214-0](https://doi.org/10.1016/S0165-1765(97)00214-0)

- Pittaluga, G. B., Seghezza, E., & Morelli, P. (2023). Media fabrication of corruption and the quality of the political class: The case of Italy. *European Journal of Political Economy*, 102461. <https://doi.org/10.1016/j.ejpoleco.2023.102461>
- Robinson, J. A., & Torvik, R. (2005). White elephants. *Journal of Public Economics*, 89(2), 197–210. <https://doi.org/10.1016/j.jpubeco.2004.05.004>
- Robinson, J. A., Torvik, R., & Verdier, T. (2006). Political foundations of the resource curse. *Journal of Development Economics*, 79(2), 447–468. <https://doi.org/10.1016/j.jdeveco.2006.01.008>
- Robinson, J. A., & Verdier, T. (2013). The political economy of clientelism. *The Scandinavian Journal of Economics*, 115(2), 260–291. <https://doi.org/10.1111/sjoe.12010>
- Ross, M. L. (2001). Does oil hinder democracy? *World Politics*, 53(3), 325–361. <https://doi.org/10.1353/wp.2001.0011>
- Ross, M. L. (2012). *The oil curse*. Princeton University Press. <https://press.princeton.edu/books/paperback/9780691159638/the-oil-curse>
- Sachs, J. D., & Warner, A. M. (2001). The curse of natural resources. *European Economic Review*, 45(4), 827–838. [https://doi.org/10.1016/S0014-2921\(01\)00125-8](https://doi.org/10.1016/S0014-2921(01)00125-8)
- Serra, D. (2006). Empirical determinants of corruption: A sensitivity analysis. *Public Choice*, 126(1), 225–256. <https://doi.org/10.1007/s11127-006-0286-4>
- Shaxson, N. (2007). Oil, corruption and the resource curse. *International Affairs*, 83(6), 1123–1140. <https://doi.org/10.1111/j.1468-2346.2007.00677.x>
- Sims, C. A. (1980). Macroeconomics and reality. *Econometrica*, 48(1), 1–48. <https://doi.org/10.2307/1912017>
- Sims, C. A. (1986). Are forecasting models usable for policy analysis? *Quarterly Review*, 10(Win), 2–16.
- Sims, C. A. (1992). Interpreting the macroeconomic time series facts: The effects of monetary policy. *European Economic Review*, 36(5), 975–1000. [https://doi.org/10.1016/0014-2921\(92\)90041-T](https://doi.org/10.1016/0014-2921(92)90041-T)
- Sims, C. A., Stock, J. H., & Watson, M. W. (1990). Inference in linear time series models with some unit roots. *Econometrica*, 58(1), 113–144. <https://doi.org/10.2307/2938337>
- Sims, C. A., & Zha, T. (1999). Error bands for impulse responses. *Econometrica*, 67(5), 1113–1155.
- Skocpol, T. (1982). Rentier state and Shi'a Islam in the Iranian revolution. *Theory and Society*, 11(3), 265–283. <https://doi.org/10.1007/BF00211656>
- Stock, J. H., & Watson, M. W. (2001). Vector autoregressions. *Journal of Economic Perspectives*, 15(4), 101–115. <https://doi.org/10.1257/jep.15.4.101>
- Titeca, K., & Edmond, P. (2019). The political economy of oil in the Democratic Republic of Congo (DRC): Corruption and regime control. *The Extractive Industries and Society*, 6(2), 542–551. <https://doi.org/10.1016/j.exis.2018.12.003>
- Torvik, R. (2002). Natural resources, rent seeking and welfare. *Journal of Development Economics*, 67(2), 455–470. [https://doi.org/10.1016/S0304-3878\(01\)00195-X](https://doi.org/10.1016/S0304-3878(01)00195-X)
- van Wijnbergen, S. (1984). The 'Dutch disease': A disease after all? *The Economic Journal*, 94(373), 41–55.
- Vicente, P. C. (2010). Does oil corrupt? Evidence from a natural experiment in West Africa. *Journal of Development Economics*, 92(1), 28–38. <https://doi.org/10.1016/j.jdeveco.2009.01.005>
- Wen, S., & Jia, Z. (2022). Resource curse or resource blessing: Perspective on the nonlinear and regional relationships in China. *Journal of Cleaner Production*, 371, 133491. <https://doi.org/10.1016/j.jclepro.2022.133491>
- World Bank. (2023). *Worldwide governance indicators*. DataBank. <https://databank.worldbank.org/source/worldwide-governance-indicators>

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