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Oil and the Future of Iran: A Blessing or a Curse?

by Mohammad Reza Farzanegan



Oil and the Future of Iran

A Blessing or a Curse?

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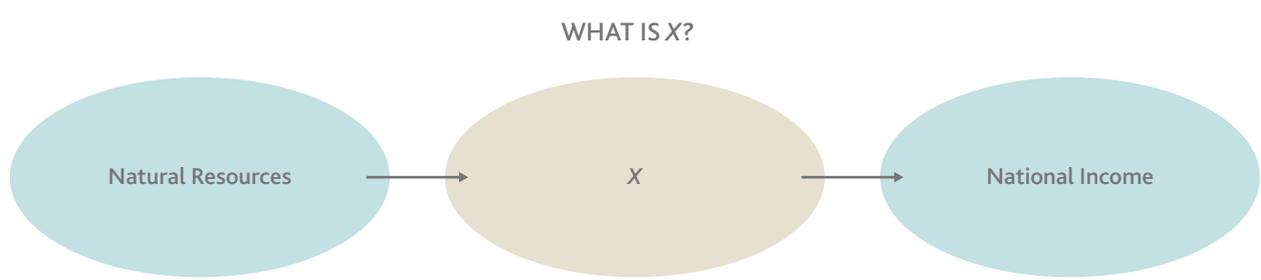
Introduction

The disappointing performance of resource rich economies, especially those with a point resource such as oil, draws our attention to the natural resource curse hypothesis. Resource curse literature addresses the puzzling role of natural resources in economic growth. It is common wisdom that those countries rich in natural resources, especially oil, are suffering from lower economic growth compared to those which do not have such resources (see Sachs and Warner, 2001). The question is: what really causes such disappointing results? (Figure 1). This paper will explore whether or not oil revenues and resources in themselves hinder economic growth. After all, there is no globally accepted theory of the natural resource curse (Sachs and Warner, 2001) and as such it is worth exploring this topic further.

The blessing and the curse of oil wealth need to be analysed in both a realistic and a practical way. "To an optimist, the possession of oil reserves is an unqualified blessing. To a pessimist, the possession of oil is a predictable curse. To a realist, oil, as anything else in life, can be blessing or curse, it all depends what is done with it" (Askari, 2006, p.8). What is done with oil wealth should be traced through the political economy of oil exporting countries. Indeed, the resource curse puzzle might be a misleading concept if we fail to take into consideration the political structure of oil economies.

In the resource curse literature, oil is curse because of factor X as shown in Figure 2. Factor X is a transmission channel of oil revenues into the national economy. Some point to Dutch disease as one these factors. The appreciation of foreign exchange during oil price booms results in a contraction of the tradable sector. Increasing the real effective exchange rate (appreciation of domestic currency) is associated with increasing oil prices, making domestic non-oil goods more expensive for foreign consumers. The major losers are industrial and manufacturing exporters who lost the international markets to their competitors.¹ Some researchers highlight specifically the rent-seeking problem in oil economies. For example, Torvik (2002) suggests that increasing natural resource

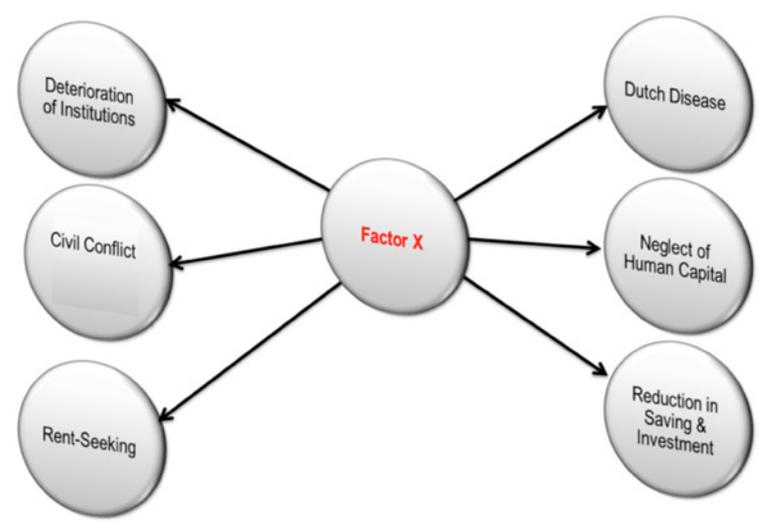
FIGURE 1. NATURAL RESOURCE WEALTH-INCOME NEXUS



rents motivates the citizens' activity in rent seeking, diverting them from the productive part of the economy. He concludes that the fall of income due to this re-allocation of entrepreneurs is more than the benefits of natural resource rents. Forgetting the importance of human capital is another transmission channel of the resource curse (see Gylfason, 2001). Due to ample oil revenues, oil economies may invest less in their human capital.

Recently economists have paid more attention to interactions between institutions and resource wealth in their analysis of the natural resource curse. Most of these studies are cross-country analyses (e.g., Boschini et al., 2007; Mehlum et al., 2006; Brunnschweiler and Bulte, 2008; and Iimi, 2007). However, how these institutions influence the relationship between natural resources and growth is country specific (Bjørvatn and Selvik, 2008). After all, oil rich economies vary considerably in terms of their institutions, political economy structures, and demographic and social norms, which make it difficult to address in cross-country analyses.²

FIGURE 2. TRANSMISSION CHANNELS OF OIL CURSE: FACTOR X



Esfahani (2007) emphasises the negative indirect effects of democratisation and factionalism for the countries that are rich in natural resources (see also Bjorvatn, Farzanegan and Schneider, 2012 and 2013). Esfahani writes that since in these countries the public knows about the government's direct access to resource rents, they expect and demand to have a share in these rents. This usually leads to inefficient mass subsidies with negative market distortion effects. In a republican state with rich oil resources such as Iran, local interest groups put pressure on the elected government to distribute these oil rents through different protectionist policies and subsidies.³ More difficulties in macroeconomic coordination, as is mentioned in Esfahani (2007), are one of the side effects of improved representation under more democratic conditions. In contrast to strong autocracies, factionalised systems experience more changes in leadership, which shortens the horizons of policy makers in office. In such systems, people demand higher levels of public expenditure than in autocratic systems (Esfahani, 2007). In an oil rich republican system like Iran, the government finances public expenditures through oil rents. This reliance on oil rent is mainly due to the weak tax administration system and high levels of tax evasion. Such a dependence on oil rents to gain the vote of the electorate leaves the macro economy vulnerable to oil shocks (for more details on the case of Iran see Farzanegan and Markwardt, 2009).

Finally, the risk of internal and external conflict is higher in resource rich economies. Several studies suggest that higher resource rents increase political instability and conflicts by financing rebel groups (Collier and Hoeffler, 2004), weakening state institutions (Fearon and Laitin, 2003), and making separatism financially attractive in resource-rich regions (Collier and Hoeffler, 2004). Farzanegan, Lessmann and Markwardt (2013) suggest political decentralisation as a solution that would lift the resource curse and increase political stability.

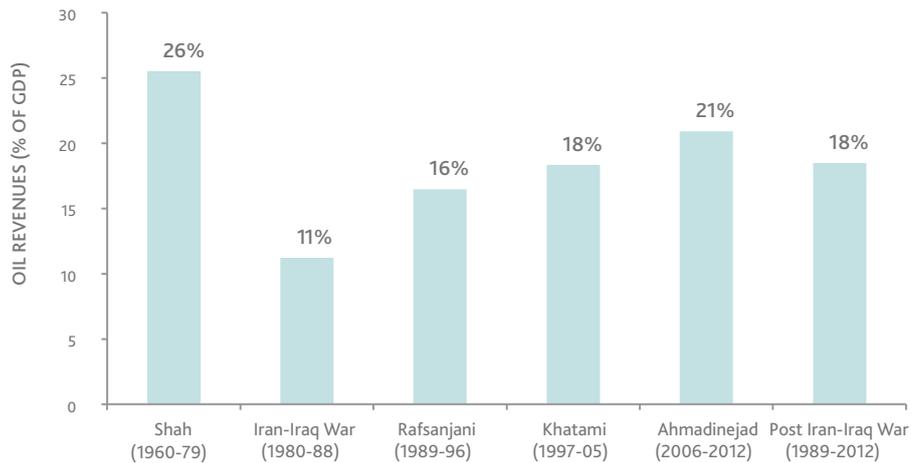
Oil Rents and the Iranian Economy

How significant is the role of oil revenues in the Iranian economy? Can we see a significant change in oil dependency after the Islamic Revolution of 1979? To answer these questions we need to present and discuss dependency and abundance indicators between Iran and oil. Oil dependency can be measured in the following ways:

—**SHARE OF OIL RENTS IN GDP:** This measure shows the relative importance of the oil sector value added (rent) for the whole economy. Figure 3 shows the development of this indicator before and after revolution: in general the dependency of the macro economy as a whole on oil revenues decreases in the post-revolutionary period, with fluctuations under different governments. Under the Shah, the share of oil revenues in Gross Domestic Product (GDP) was 26%. This dependency reduces to a minimum of 11% during the eight years' war with Iraq. This reduction, however, does not imply a higher diversification of the economy but simply a reduction in the value of oil exports due to the war. The ratio shows a continuous increase after the war under Rafsanjani, Khatami and Ahmadinejad, reaching 21% under the last government.

FIGURE 3. SHARE OF OIL REVENUES IN THE IRANIAN GDP (1960-2012)

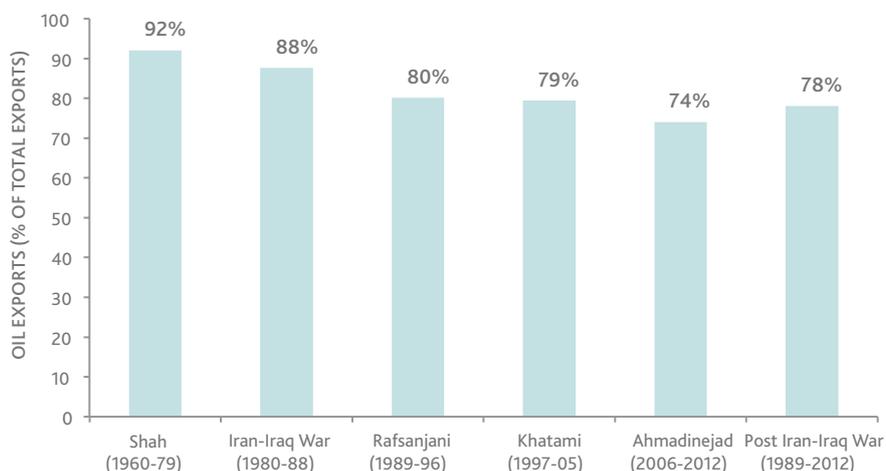
Source: OPEC (2013) and author calculations



—SHARE OF OIL EXPORTS IN TOTAL EXPORTS: This ratio shows how much of a country’s exports depend on oil resources. In contrast to the moderate dependency of the total economy on oil revenues, the Iranian foreign exchange revenues (total exports) significantly depend on the oil industry and international oil markets. The dependency was the highest, on average, during the Shah period of governance (92%). Although this dependency reduced moderately in the post-revolution period, it is still high. Despite of all official willingness to encourage non-oil exports, the numbers show little success. On average 80% of total foreign reserves depends on oil exports. Figure 4 shows this trend from 1960 to 2012.

FIGURE 4. SHARE OF OIL EXPORTS IN TOTAL EXPORTS OF IRAN (1960-2012)

Source: OPEC (2013) and author calculations

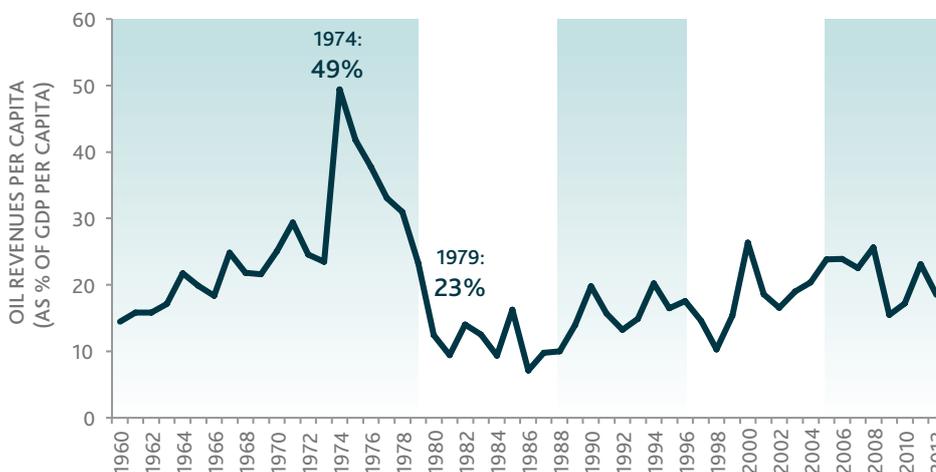


—PER CAPITA OIL REVENUES: This indicator shows to what extent the ruling regime has the financial resources to influence its relationship with society. This can tell us the ability of the state to repress political opponents and buy peace and stability by distributing oil wealth in the form of subsidies and public employment. The per capita oil revenue (in nominal prices) on average for the Shah period was \$231 USD, increasing slowly post-revolution under Rafsanjani and Khatami to \$365. This jumped to more than \$1000 under the Ahmadinejad government, thanks to higher oil prices. If we control for changes in US consumer prices and calculate per capita oil revenues in real US dollars the picture would be different. Under the Shah regime, on average each Iranian received \$865. This per capita earning reduced after the revolution to \$397 under the Khatami government. However, even in real prices the Ahmadinejad government could allocate on average \$977 to each Iranian.

A better measure, called "rent leverage", is introduced by Smith (2011). Rent leverage can be calculated by the share of per capita oil revenues in GDP per capita. This indicator shows the portion of an average Iranian citizen's annual income that depends on oil revenues. This ratio answers the following question: how much of each individual's livelihood is on average a function of a regime's ability to allocate fuel rents? Figure 5 shows the trend share of oil revenues per capita as a percentage of GDP per capita from 1960-2012. In 1974 almost half of income per capita was derived from oil revenues, showing a high dependence of livelihoods on the allocation of oil rents by the state. Since 1974 we observe a continuous reduction in the rents leverage, reaching 23% in 1979. At the end of war with Iraq in 1988, oil rents constituted only 10% of income per capita. Overall, reduction of this indicator signals the difficulty of rentier states to influence the material life of people directly.

FIGURE 5. RENTS LEVERAGE IN IRAN (1960-2012)

Source: OPEC (2013) and author's calculation



Tracing the Oil Curse in Iran

Figure 2 provides a starting point to investigate the possible transmission channels of the oil curse in Iran. Next I examine these channels to see whether or not the Iranian economy has been affected negatively by oil wealth.

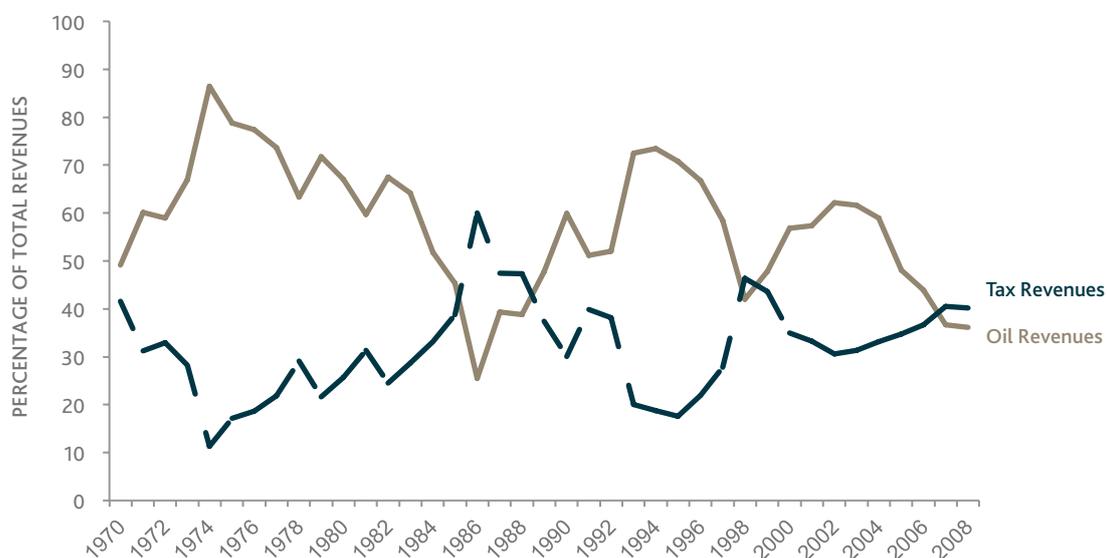
Oil and Democracy

Ross (2001) uses panel data from 1971 to 1997 for 113 countries and finds a negative correlation between oil and democracy. He mentions 3 reasons for this negative association:

—THE WAY A GOVERNMENT COLLECTS ITS REVENUES MATTER. A rentier government collects fewer taxes from the population, hence it is less accountable in return; no representation without taxation. Oil gives the state financial independence from the people, reducing the political will for substantial reform in the political economy. Also due to a lower tax burden the citizens themselves have less willingness to undermine the ruling state for their political or economic demands. Can we see any evidence of a negative association between oil revenues and tax revenues in Iran? Using government budget data from the Central Bank of Iran, the correlation between the share of oil revenues in total revenues and the share of tax revenues in total revenues is highly negative (-0.95). This shows that the government reduces its effort to raise taxes in the case of positive oil markets. Figure 6 shows the co-movement of oil revenues and tax revenues (as a percentage of total revenues) in Iran.

FIGURE 6. RELATIVE SIZE OF OIL AND TAX REVENUES (IN TOTAL REVENUES %)

Source: CBI (2013) and author calculations

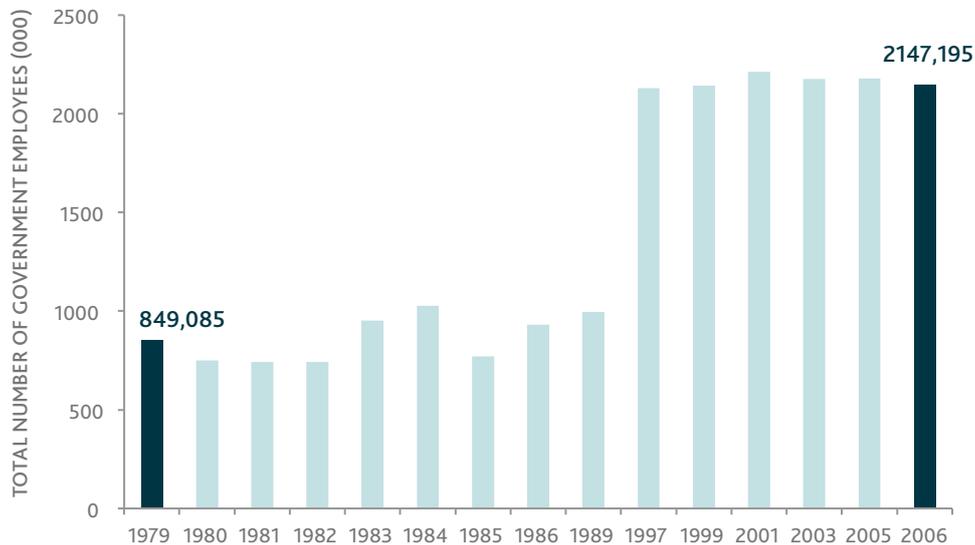


—THE WAY A GOVERNMENT SPENDS OIL MONEY MATTERS: oil-rich governments usually spend more on public services in the form of subsidies and public employment, besides military spending, in order to pacify political unrest and fill the democracy deficit in their countries. In 2010, just before the recent subsidy reform, Iran was first in the global ranking of fossil fuel consumption subsidies (80.8 billion US\$) followed by Saudi Arabia (43.5 billion US\$) and Russia (39.2 billion US\$).

Per capita each Iranian received on average about \$1000 from fossil fuel consumption subsidies in 2010—putting Iran at 5th in the global ranking of fossil fuel consumption subsidies per person after other oil countries such as Kuwait, UAE, Qatar, and Saudi Arabia.⁴ Besides payment of subsidies, the number of public employees in the first three decades after revolution showed a significant increase of 153%. This number has increased from 849,085 in 1979 to 21,47195 in 2006 (the last available data point). Figure 7 shows the increasing size of government administration in oil-based economy of Iran.

FIGURE 7. PUBLIC EMPLOYEES IN IRAN (1979-2006)

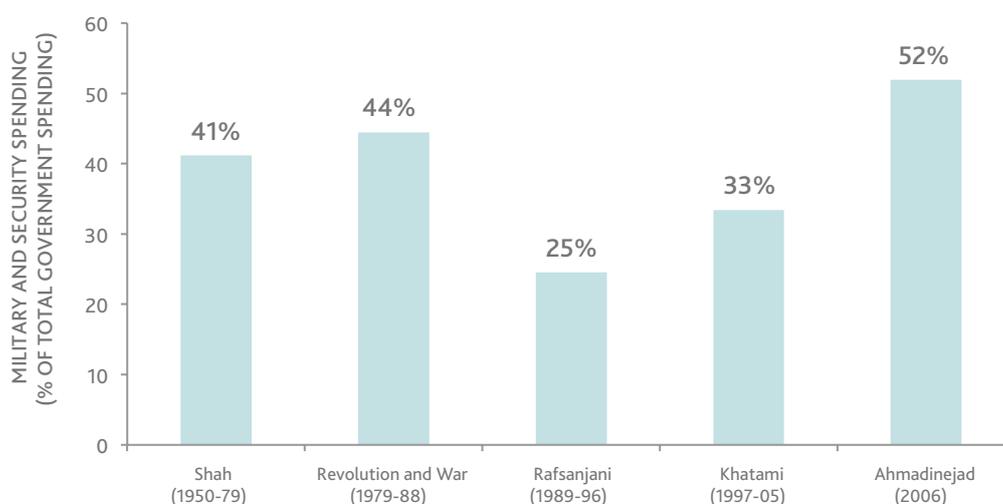
Source: Statistical Center of Iran: <http://www.amar.org.ir/Portals/0/PropertyAgent/461/Files/596/85-1351.XLS>



—THE WAY A GOVERNMENT IN A RESOURCE RICH COUNTRY REPRESSES SOCIAL GROUPS THAT MAY DEMAND POLITICAL RIGHTS MATTERS: Oil rich economies often use repression if distribution policies fail. A major part of government spending in resource rich countries is allocated to security and military spending. For example, the share of military and domestic security spending in the total government spending in 2006 (beginning of the Ahmadinejad government) was 52%, while the portion of health and education spending was only 3% and 15%, respectively. To compare: The Shah regime allocated 41% of its budget to military and security spending, 4% on health and 16% on education (and the rest to other categories). During the 8 years of war with Iraq, the share of military and security spending increased by 44% while we also see a marginal increase in the share of the budget for health and education. Under the Rafsanjani government, from 1989 to 1996, we can see a reduction in the military and security budget, which also makes sense. Under the reformist state of Khatami the share of spending on education and health decreased while more funding was given to military and security departments. His time in office from 1997 to 2005 coincided with the terrorist attacks of 11 September and the US war with Iraq in 2003. Overall, military and security spending gets much of the oil rents.⁵ Figure 8 shows the development of military and security spending during the different political periods in Iran.

FIGURE 8. MILITARY AND SECURITY SPENDING IN IRAN (1959-2006)

Source: CBI (2013), Annual National Accounts and author's calculations



Oil and Dutch Disease

Another transmission channel of the oil curse in the Iranian economy can be seen as Dutch disease. In theory we have three sectors in the economy: the natural resource sector, the non-resource tradable sector (agriculture and manufacturing) and the non-resource non-tradable sector (services). Prices of the tradable sector and natural resource sector are determined on international markets while the non-tradable sector is determined domestically. The real exchange rate is defined as the price of non-tradable to the price of the tradable sector. Dutch disease can happen due to two channels following a positive oil shock: the spending effect and the resource movement effect.

In the case of the spending effect, a positive oil revenue shock increases both public and private demand for all products. Increasing demand for tradable goods can be covered by increasing imports at international prices. However, the supply of non-tradable goods such as services and construction is less flexible, pushing up their prices in the market. This leads to increasing wages in the economy, which reduces the profit margin in tradable sectors, such as manufacturing.

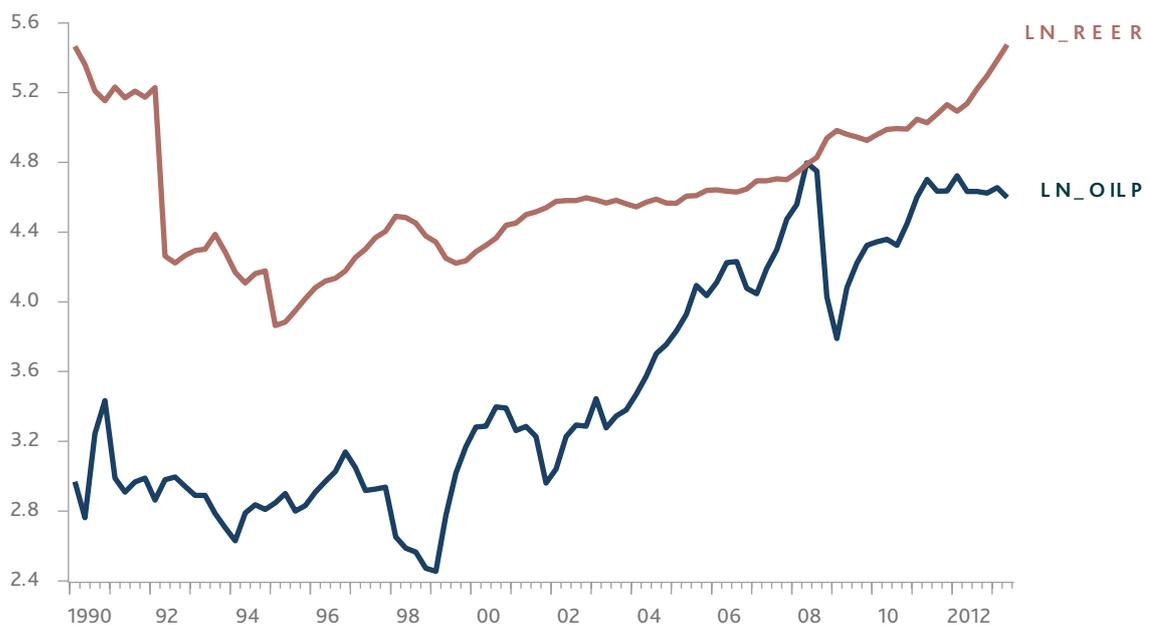
In the case of the resource movement effect, a booming natural resource sector attracts labour and capital from the rest of the economy, which leads to lower output in all other sectors. Lower supply, especially in the non-tradable sector, increases relative prices for this sector.

In the long run both these channels lead to the de-industrialisation of the economy and higher prices of non-tradable goods relative to tradable ones, which results in the appreciation of real exchange rates. Increasing real exchange rates makes domestic goods more expensive in international markets, reducing the competitiveness of local producers in foreign markets.

After this brief theoretical explanation, the question is whether we have empirical evidence for Dutch disease in Iran. One way to answer this question is to look at the correlation between oil prices and a real effective exchange rate. The positive and significant response of real effective exchange rate of Iran to oil price shocks can signal a Dutch disease problem. My correlation analysis shows that there is no significant co-movement between the logarithm of real effective exchange rates and the logarithm of oil prices for the whole period of 1975-2013. However, if we limit the sample to the post-war period (after 1989), we can see a statistically significant positive correlation between these two variables, as the Dutch disease hypothesis suggests. Figure 9 shows the significant positive correlation between oil prices and real effective exchange rate in Iran.

FIGURE 9. DUTCH DISEASE: APPRECIATION OF REAL EXCHANGE RATE IN IRAN (1990Q1-2013Q2)

Source: IFS (2013) and author calculations. Note: $\ln OILP$: logarithm of oil prices and \ln_REER : logarithm of real effective exchange rate.



We can also look at the long-term association between value added of tradable sectors (manufacturing and agriculture) and oil prices in Iran to trace Dutch disease. Looking at the correlation between oil prices and real estate services in Iran provides initial evidence for the positive association between these two variables from 1959-2010. This positive and significant correlation does not change before or after the revolution of 1979. This is in line with a prediction of Dutch disease: a real estate sector boosted by increasing oil prices.

How about the agricultural sector? The agriculture sector shows a significant reverse correlation with the increase in oil prices in Iran. This negative association of -0.60 for the whole time period was stronger before the revolution (-0.80) than post-revolution (-0.69). This provides important initial evidence of the effect of Dutch disease in Iran. There is also negative correlation between the size of industry in GDP with oil prices before and after revolution.⁶

Oil and Education

Oil rich states pay less attention to the development of human capital of their citizens. In his econometric analysis, Gylfason (2001) shows a negative association between natural resource wealth and government spending on education, expected years of schooling for girls, and gross secondary-school enrolment rate. He concludes that the resource curse can be explained partly by the human capital deficit in resource rich

economies. My global observation of the last 50 years of data on resource wealth and different indicators of human capital is as following: There is a negative correlation between oil rents (% of GDP) and public spending on education (% of GDP): -0.22. This is also true when we consider the total natural resource rents, including mineral, forest, natural gas and coal. The negative correlation is however weaker in size than for the former case: -0.16.

There is a strong negative correlation between oil rents and school enrolment, tertiary (% gross): -0.42. The same association applies when we look at total resource rents, which is weaker than the negative correlation with oil rents. We observe the same negative pattern of correlation with secondary school enrolment (% gross).

There is also a negative correlation between resource wealth and adult literacy rate across countries in the last 5 decades. This negative correlation which is weaker compared to above cases is close to zero when we consider total resource rents than only oil rents.

In short, the general observation shows that natural resources, and especially oil, are associated with lower human capital at different levels. Can we also find such negative association by looking at the Iranian experience? To answer this I examine the correlation between the share of oil group value added in GDP and the relative share of public education in GDP from 1959 to 2006, basing my calculation on data from the National Accounts of Iran. Iran is not an outlier: the correlation is strongly negative (-0.67). A similar negative association is also seen if we use the share of government spending on education as share of total government spending (-0.48). Farzanegan (2011) shows that while the response of military and security spending in Iran to positive oil revenues shocks is increasing, we cannot observe such a significant response on the side of other non-military spending such as education and health.

The Future of Iran in the Shadow of Oil

Improving the quality of economic and political institutions is shown to be key in addressing the resource curse (Mehlum et al., 2006). Oil revenues cannot lead to higher economic growth if corruption is extensive, freedom of the press and the free exchange of information is restricted. Following well-established policies and tools in developed and resource rich countries by itself does not reduce the risks of the oil curse. The example of the Oil Stabilization Fund in Iran in 2000 is useful. The main goal of the Oil Stabilization Fund (OSF) was to reduce the dependency of the government's annual budgets on oil revenues, especially its current expenditures. The goal was to increase the share of other source of revenues such as taxes in financing the government's current expenditures. The second goal was to address the symptoms of the Dutch disease, specifically avoiding the real appreciation or depreciation of domestic currency due to the fluctuations of oil prices. Article 60 of the Third Five-Year Development Plan-TFYDP-

(2000-05) provided the necessary regulatory tools to set up the “crude oil foreign exchange reserve account” by the Central Bank of Iran.

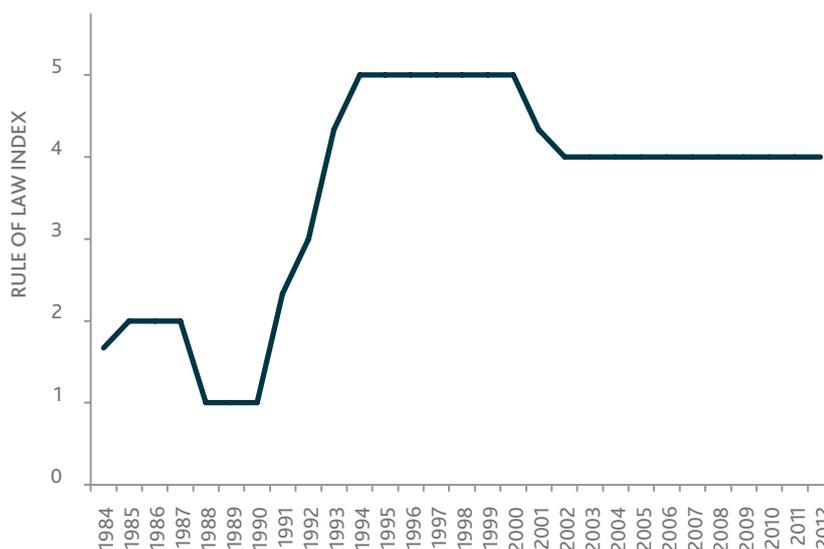
A major hindering factor in realising the blessing of oil revenues is the extensive corruption in the political system. Administrative and political corruption distorts markets and leads to a misallocation of scarce economic resources. Corruption has a significant negative effect on economic growth (see Mauro, 1995, Knack and Keefer, 1995; Tanzi and Davoodi, 2001; and Mo, 2001, among others).

Another important aspect of institutions, which can modify the oil-economic growth nexus, is the rule of law. There is hardly any investment in an economy with a fragile judicial system that lacks the transparency of rules and regulation and their effective enforcement. In order to attract international investors, governments need to guarantee and protect property rights. High crime rates and widely illegal strikes can discourage investors from any significant and long-term investment, adding to unemployment problems and hindering the realisation of positive growth effects from oil revenues.

Figure 10 shows the development of this index in Iran. The index was at an alarming level in the 1980s, which was mostly due to revolutionary and ideological approaches to rules and regulation and the special situation the country faced during the war with Iraq. The index shows a significant improvement under the Hashemi and Khatami governments, which was necessary to attract investors to rebuild destroyed infrastructure and create employment for the large size of ready to work population.

FIGURE 10. RULE OF LAW INDEX IN IRAN

Source: ICRG (2013)



The quality of the bureaucracy also matters for the final income effects of oil resources. Stability of regulations and general policies toward macroeconomic policies across different governments are important factors for investors who want to invest for the long term in a country. The institutional strength and quality of the bureaucracy is a shock absorber that tends to minimise revisions of policy when governments change. ICRG gives higher scores to countries in which “bureaucracy tends to be somewhat autonomous from political pressure and to have an established mechanism for recruitment and training. Countries that lack the cushioning effect of a strong bureaucracy receive low points because a change in government tends to be traumatic in terms of policy formulation and day-to-day administrative functions”. The maximum score is 4. The average of this index for Iran from 1984-2012 is 1.83, which is lower than UAE (2.53), Bahrain (2.41), Saudi Arabia (2.27), Oman (2.20), and Kuwait (1.94). Since 1998 the score of bureaucracy quality in Iran has remained constant at 2.

It is easier to waste the oil wealth in sectors that are most prone to corruption when the media is censored and political competition is weak. The Voice and Accountability index of the World Bank also shows a worrying situation for political institutions in Iran. Voice and Accountability captures perceptions of the extent to which a country’s citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and media freedom. Estimates give the country’s score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. The trend shows a continuous decline in the quality of political institutions in Iran since 1996. Iran fell to its lowest score in 2011.

Oil rents and economic growth in Iran: An empirical investigation

In this section I examine the short-term growth effects of oil rent changes in Iran, answering the following questions:

- 1) Can we see a significant change in the oil-growth nexus in Iran before and after the Islamic Revolution in 1979?
- 2) Can we see a significant change in the oil-growth nexus after establishment of the Oil Stabilization Fund in 2000 by the reformist government of Khatami?
- 3) Can we find empirical evidence of the demographic curse in Iran as is shown by Bjorvatn and Farzanegan (2013) around the world?

For this empirical investigation, I use time series data and the Ordinary Least Squares (OLS) method of estimation. All variables except for dummy variables are in growth rates (by differencing their logarithmic transformation). The dependent variable is GDP per capita growth rate (in real prices). The main independent variable is value added of oil group (crude oil, natural gas and refinery goods) per capita growth (in real prices). For robustness I use also value added of oil as share of GDP. Republic dummy equals 1 for post 1979 period and 0 otherwise. The OSF dummy equals 1 for the years 2000-2010 and 0 for the rest.

To answer questions 1 and 2, I use an interaction term between oil and each of these 2 dummy variables: the interaction term shows how the final growth effect of oil changed after the revolution and after the establishment of the OSF. Oil is not the only driver of growth in Iran. Growth literature shows that the investment rate, the size of government spending in the economy, and trade openness are robust drivers of income. Thus I also control for them. Changes in terms of trade are also important. I use oil price growth rates as a proxy for terms of trade. To control for external demand shocks, I also control for global GDP per capita growth rates.

To reply to question 3 I use the share of the working age population (ages 15-64 years) in the total population as a proxy for demographic transitions and interaction of this indicator with oil as a variable. The time period of analysis is 1950-2010 and the main source of data is the National Accounts of Iran, published by the Central Bank. Oil prices are from the IMF and the International Financial Statistics database. Demographic variable and growth rates of other regions are from the World Development Indicators of the World Bank. Table 1 shows the estimation results.

TABLE 1. GROWTH EFFECTS OF OIL RENTS IN IRAN (1959-2010)

MODELS	1	2	3	4	5
	Dependent variable: GDP per capita Growth				
	Using per capita oil rents growth rate			Using oil rents (% of GDP) growth rate	
Oil	0.38***	0.44***	0.43***	0.36*	0.50***
	(8.10)	(10.8)	(12.8)	(1.88)	(2.59)
OSF Dummy	0.04***	0.01	0.01	0.05***	0.008
	(2.77)	(0.92)	(0.92)	(2.75)	(0.48)
OSF_Oil	0.05	-0.09	-0.09*	0.01	-0.13
	(0.85)	(-1.24)	(-1.84)	(0.19)	(-1.28)
Republic Dummy	-0.04***	-0.06***	-0.05***	-0.07***	-0.07***
	(-2.65)	(-3.00)	(-3.12)	(-3.35)	(-3.40)
Republic_Oil	-0.21***	-0.28***	-0.27***	-0.21	-0.36**
	(-4.43)	(-6.23)	(-7.38)	(-1.15)	(-1.95)
Investment (lag)		-0.03	-0.00		0.02
		(-0.48)	(-0.16)		(0.31)
Gov. Spending (lag)		-0.04	-0.00		0.05
		(-0.52)	(-0.13)		(0.59)
Trade (lag)		0.07	0.07		0.11
		(0.74)	(0.66)		(0.82)
Oil price (lag)		0.02	0.02		0.00
		(1.20)	(1.18)		(0.09)
World Growth(lag)		-0.008*	-0.005*		-0.00
		(-1.84)	(-1.77)		(-1.12)
Demog (lag)		2.14***	2.03***		1.96***
		(3.90)	(4.18)		(3.24)
Demog_Oil (lag)			-7.80*		-11.2*
			(-1.82)		(-1.69)
Observation	51	49	49	51	49
Adj. R-sq	0.63	0.69	0.71	0.40	0.52

Note: All models include a constant term (not reported). Robust t-statistics (using HAC standard errors & covariance) are reported in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

Models 1-3 use per capita oil rents growth rate as a proxy for oil wealth. In models 4 and 5, I use the share of oil rents in GDP for robustness tests. The direct short-term effect of oil on economic growth is positive and statistically significant in all 5 models. Oil, at least in the short run, is a blessing for economic growth.

Resource curse literature also refers to a “long-term” negative effect of oil wealth on the economic growth of countries. This direct and significant result highlights the importance of oil in the political economy of Iran. The current energy sanctions, by

limiting Iranian oil production and export capacities, will have significant negative consequences for national income development.

I am also interested to see if the positive growth effects of oil have been amplified by the introduction of the OSF in Iran. Interaction of oil and the OSF, however, does not show a significant intermediary role for the OSF in the short term.

Another question was if the government of the Islamic Republic, compared to the previous monarchical system, had performed better in benefiting from oil rents. The estimated negative coefficient of interaction of oil with the Islamic Republic dummy variable, which is also statistically significant, does not prove this. Indeed, the positive direct growth effect of oil has reduced significantly in post-revolution period.

I also have tested the validity of the estimation of Bjorvatn and Farzanegan (2013) for the case of Iran. Iran has been experiencing a major demographic change since 1990s. The demographic window of opportunity has been open for several years. A greater working age population, as we also see from results, is good news for economic growth. This direct positive effect very much depends on the capacity of the economy to absorb the demographic rent. If the economy fails due to Dutch disease, increasing the working age population may lead to higher unemployment and political instability. The negative interaction between oil and working age population in this estimation implies this reality.

Conclusion

This paper examines the growth effects of oil on Iran and aims to outline the different transmission channels that explain how oil shapes the economy. The empirical investigation highlights the importance of oil rents (measured as per capita and share of GDP) in the economic growth of Iran since 1960. In the short term, oil revenues are a blessing for Iran's economic growth (see also the work of Mohaddes and Pesaran 2013 for blessing and curse of oil for Iran). The production of oil is a significant factor when considering future economic growth in Iran. This significance highlights a weak point of an Iranian economy that can be easily affected by external events. The on-going sanctions and their impact on oil production demonstrate this clearly. The introduction of the Oil Stabilization Fund in 2000 has not been able to amplify the positive short-term growth effects of oil rents. Iranians under the Islamic Republic's government have benefited less from the increasing oil rents in terms of economic growth compared to the previous regime.

Why have the positive growth effects of oil been reduced post-revolution? Political factionalism has proven to be a key factor in the diminishing returns from oil in Iran.⁷ Demographic transition, which can be a blessing for any country, seems to be a demographic curse in Iran due to the negative consequences of Dutch disease. Consequently de-industrialisation and higher unemployment following Dutch disease increases the risk of a demographic curse. The latter results are in line with findings of Bjorvatn and Farzanegan (2013).

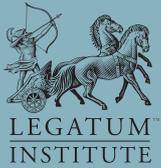
What can be done? Oil per se is not a problem for economic growth in Iran. The main policy challenge is increasing transparency and the flow of information by increasing freedom of press, reducing political corruption and enhancing the rule of law. The policy recommendations such as transferring oil revenues to an oil development fund and financing the government budget by increasing tax revenues is too simplistic, especially in the context of Iran, which has a large shadow economy and on-going economic sanctions. Before increasing taxes, policymakers need to address the drivers of the shadow economy. Otherwise a higher tax burden will lead to more off-the-book activities, undermining the initial goal of policy makers. In addition, as discussed in the paper, the critical policy issue is not the transfer of oil dollars to an oil fund, which already exists in Iran, but the governance of that fund. Also one needs to consider the energy and banking sanctions when thinking about policy suggestions. Farzanegan (2013) shows how the on-going sanctions can increase the shadow economy in Iran, and therefore increasing taxes as a policy for addressing the oil curse will require lifting the sanctions as well.

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- ¹ See Corden, 1984 and van Wijenbergen, 1984 for theoretical explanation of this phenomenon.
- ² The approach of this paper is in line with a collection of case studies outlined in Rodrik (2007), in which Rodrik sheds light on the critical role of factionalism on economic growth by studying country specific experiences. "I believe in the need for both cross-country regressions and detailed country studies. Any cross-country regression giving results that are not validated by case studies needs to be regarded with suspicion..." (Rodrik, 2007, p.4).
- ³ The mass subsidies and inefficient protectionism through popular macroeconomic policies in post-revolutionary Iran resulted in a significant amount of smuggling. For more details see Farzanegan (2009).
- ⁴ http://www.earth-policy.org/datacenter/xls/highlights24_3.xls
- ⁵ Farzanegan (2011) shows how each of these spending categories responds to positive and negative oil shocks in Iran.
- ⁶ Value added data are taken from Iranian National Accounts: <http://www.cbi.ir/page/4455.aspx>
- ⁷ See Bjorvatn, Farzanegan and Schneider, 2012 and 2013 for further details on the role of factional politics.

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