

INTERSECTORAL ELASTICITY MODEL AND ELITE DYNAMICS IN THE PETROLEUM EXPORTING MENA-STATES

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Abstract

In this paper by focusing on the economic (incentive) structure as the major explanation of the elite shift and persistence of de facto political institutions, we follow economic determinism that seems to make sense in the context of the petroleum abundant states. The theoretical model based mainly on the observations from the oil and gas rich MENA region countries in the Caspian basin shows once more analytically that the elite shift and persistence in the MENA region since 1950s could easily be explained by the relative weight of the petroleum revenues in the revenue structure. In addition, we show for the case of the UAE, that following the Hardwick's rule could increase the level of the non-petroleum tax revenue and hence, revive once powerful *merchants* and *bazaaris* as the leading economic and political force. To model the dominance of the manufacturing or mining sector we apply the derived demand approach.

Keywords: *elite shift, petroleum revenue, intersectoral elasticity model, MENA states*

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1. Introduction

Revolutions often do not result in the revolutionary changes in the political and economic essence of these countries. After notable formal transformations we observe in a plenty of cases the relapse of the pre-revolutionary political setting using probably the new ideological forms to protect political and economic dominance of the new elites. Napoleon Bonaparte who fought against the monarchy crowned himself emperor. Bolsheviks coupé Nikolay II to free the workers and peasants and created GULAGs reminding very much slavery. Haile Miriam who coupé Haille Selassie, a dictator who ruled Ethiopia for more than four decades, resembled increasingly his predecessor in ruling Ethiopia. Despite Arabellions and regime changes in a number of MENA-states we can observe both democratic changes but in the same time persistence of the old authocratic patterns, economic hardships, increasing economic dependence on the more authocratic Arab states like Saudi Arabia and the rise of inequality in the countries like Egypt, Tunisia and Lybia. Similar persistence of bad political institutions could be observed with regards to Bolivia, Haiti, Zimbabwe, and South Africa. We could also observe the fall of the USSR and the rise of the communist nomenklatura just in a couple of years in a number of the post-Soviet republics (Luong 2002, Sadik-Zada 2016).

Acemoglu and Robinson (2006) emphasize the importance of the history of each country in the understanding of this kind of institutional persistence. Pauline Luong writes about the importance of the structural-historical context in explaining institutional continuity. Nevertheless, the similarity of the petroleum exporting states both in their historical preconditions, underdeveloped industrial base prior to commodity boom and the shift of the economic gravity center from trade and agriculture to the mining sector after getting independence enable some very useful generalizations about institutional development in the petroleum abundant countries. Samuel Huntington in his book entitled *The Third Wave* writes regarding the developing nations: “ *‘No taxation without representation’ was a political demand: ‘no representation without taxation’ is a political reality.*” Today this inversion of the logic is mainly picked out by Middle East specialists what is by no means an accident. Michael L. Ross analyzed 113 countries and found out that between 1971 and 1997 Middle East and North Africa was the only region where Taxes-to-GDP ratios fall (Ross 2004). The most obvious explanation of it are the petrodollar windfalls beginning from the 1970s.

According to Lisa Anderson (1987) there are fundamental differences between a European and Middle Eastern State. She writes that in the hydrocarbon-rich MENA states there is no historical linkage of state formation, taxation, participation, and legitimacy that could be observed in Western Europe. She writes on the dependency structure in these societies emerged after 1950s:

“Virtually no state in the region relies solely on its domestic population for resources, and many governments are more often accountable for their spending, when they are accountable at all, to foreign lenders and donors than to their own people.” (Anderson 1987, p. 17)

Before big oil and gas both in Kuwait and Qatar, the government depended heavily on the taxes levied on the merchants. Merchants were at that times economically the most influential societal group and this economic power resulted also in large-scale political influence in the policy-making. After the discovery of large oil and gas reserves and their exports, oil revenues allowed the autocratic governments of Kuwait and Qatar to stop taxing the merchants. After losing the economic weight in the economy the merchants lost their immense political power in the policy-making of Kuwait and Qatar (Crystal 1990, Peterson 2007).

After studying the case of Kuwait and Qatar I started an extensive survey of the other hydrocarbon-rich or foreign aid-dependent countries in the MENA-Region. The same algorithm of power shift from the entrepreneurship towards the state elite could be observed almost in all the hydrocarbon-rich MENA-States. In foreign-aid dependent Jordan we could observe an opposite development towards decentralization and democratization in the 1980s. Brand (1995) surveyed the case of Jordan and found out that the fall of the foreign aid, the consequent increase of the taxes and falling state subsidies led to social unrest in the 1980s. This resulted in the revision of the election laws and more competences for the parliament.

Also Iran, a country fundamentally different from its oil-rich Arab neighbors verifies our hypothesis about the power and elite shift. Iranian society consisted since the XII century of merchants, landlords and clerics. According to Najmabadi (1990) Iran entered the new century as a country with rich political culture. Economic structure also was positive and in the 1940s a reform-oriented politics with a strong social base among the business elites and traditional middle classes emerged.

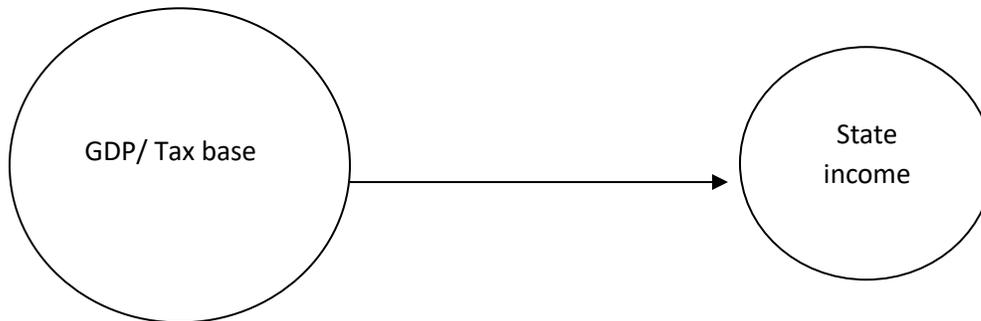
But with the oil windfalls from the mid-1950s in the Pahlavi state the commercial bourgeoisie, the traditional *bazaaris* and landlords lost their economic significance and political power as well. They constituted no longer a part of the political elite of the country.

Under the Shah the agricultural sector was repeatedly neglected because the state was not dependent on surplus extracted from agriculture for its capital accumulation functions (Najamabadi, 1990, S. 214). After 1953 Iran lost this social and economic base for the reforms. There was a break in the continuity of this reformist politics of the elite and elite shift.

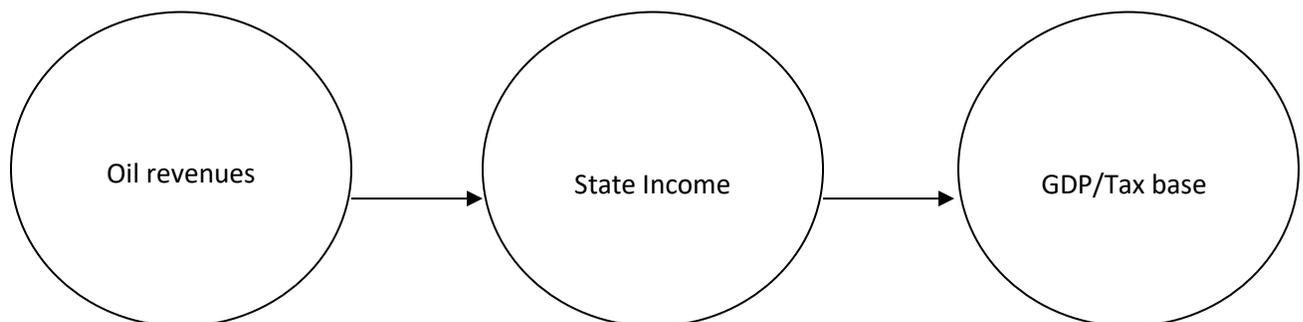
“The autonomy of the state from a tax base resulted in a progressing narrowing of the politically relevant body of decision makers, which ultimately was reduced to the person of Shah”(Najambadi 1990, p. 214). Oil revenues in Iran enabled the autonomy of the state from all indigenous social classes. The increasing independence from reliance on a tax base made it possible for various economic and social policies to be followed without much regard for social consent.

Middle Eastern states play a greater role in the domestic economy and are less directly beholden to economically powerful domestic classes or groups than in the other regions of our planet (Anderson 1987, p. 12).

A government be it a democracy or dictatorship needs financial resources to secure stability in the jurisdiction it rules. Without satisfaction of the basic needs of the citizens, a strong and reliable police, army, and bureaucracy a government cannot survive. Only with sufficient resources, a state structure would not be able to be stable in history (uciani 1987, p. 64). Different political regimes and different geographical areas have a different level of resources needed to sustain stability. For its own survival a state structure gathers its financial resources through taxation. That is why the state is interested in the strong and taxable economic base. In a resource-poor economy, the state income depends on the surplus created in manufacturing, services and agriculture. There is congruence in the interests of the state and domestic value creation. We see here dependence of the state income and political stability on the domestic tax base. In the rule tax revenues constitute the lions share of the state / budget income. The state structures are interested in the growth of the value creation in the private sector.



Resource abundance and resource exports generate a windfall of revenues and if the resource revenues are disproportionately high then these resource exports determine the level of GDP. The relative importance of the value creation in the non-resource sector diminishes. That means that the causal chain in an oil-rich country could be inverted. The level of non-oil-GDP does not determine the level of state income but the state revenue determines the level of GDP.



The change in the dependence structure changes the role and the character of the state. The role of the state shifts from provider of public goods through coercive taxation of domestic economy to a provider of favors through the benevolence of the government (Beblawi 1987, p. 53). In addition to this, in the countries with substantial fossil resources the resource boom changes the budget of a developing or transitional economy from deficit to surplus budget. The surplus character of the state budget opens new options for the incumbent governments. Before the boom they had to allocate

the scarce budget revenue so that the political and economic stability is secured. After the boom this restriction disappears. A new freedom – freedom to dispose over the surplus emerges. The smaller the relation of tax revenue to the oil revenue the less is the interest of the government to promote manufacturing.

For government decrease or even full abolishment of taxes could play not an important role anymore. Moreover, with small or no taxes the citizens are less demanding to the government than with an average or high tax rates (Ross 2004).

State income in an oil-rich country is determined by the external revenues. These make the state structures independent from the domestic economy. And as it will be shown model-theoretically in the basic model later the state elite has an incentive to divert its efforts from supporting industrialization to support its own enrichment which is in conflict with the interests of the domestic economy.

2. *Basic Definitions*

In this paper we define an elite as the group who has a dominating position in the shaping both political and economic institutions. The major difficulty in dealing with the role of elites in the An important question for our modeling part is the question of the major determinants of economic policy. To do this we make one important assumption concerning the empowerment of one or other homogenous or linked group of persons to elite. There were phases in the human history, for instance in the ancient Athens or Rome were dominated by policy and middle ages Europe by Catholicism. For these cases we could observe the primacy of non-economic factors as the major determinants of socioeconomic life (Callinicos 1987). Nevertheless, there are also plenty of examples from all socioeconomic formations whereby the “economic base” dominated the society as a whole and politics in particular (Marx 1996, pp. 158-162). After emergence of capitalism in the XIX century economic determinants play the decisive role in capitalist societies. A glimpse on the MENA states reveals the ambivalence of the question of the elites in these societies. Despite parallels with the medieval Europe dominated by Catholicism and dominance of religious rules, we can observe a consolidation of the elites in these societies, which is based on the hydrocarbon riches. The state elites internalized the religious constitutions but in essence, the religious legal systems do not pose a threat to the dominance of the state capitalism. In contrast, the state elite uses Islam very

often as a moral fundament for the dynastic rule and kinship, which forms the core of the inter-elite relationships in the case of the MENA states. This corroborates

Also the empirical evidence suggests that the structural break in the revenue structure of the Gulf states has taken away the dominating role of the merchants and bazaaris and granted this to the state, monopolizing with the emerging petroleum sector both polity and economy.

3. *Rent-Seeking Elasticity of Output as a Measure of De-Industrialization of the Manufacturing Sector*

We assume that the tax revenues generated in the capitalist sector, τY_m , and nonrenewable resource revenues, R , constitute the revenue side of the hypothetical state budget. We denote manufacturing output by Y_m ; the constant and exogenously given tax rate by τ ;¹ resource revenues by R ; and constant public expenditure by \bar{C} .² To save additional notations we assume that the fixed legal income of the elite, I^{fix} , is encompassed by \bar{C} , e.g. $I^{fix} \in \bar{C}$. In accordance with the results from chapter 3 we assume that rent-seeking is not a zero-sum situation and has a negative impact on the level of manufacturing output, $\frac{\partial Y_M}{\partial \psi} < 0$ whereby in the Lewis framework rent-seeking harms manufacturing through political bargaining resulting in higher wage bills and consequent limitation of profits and expansion of the manufacturing sector.³

The state elite make the decision about the magnitude of illicit appropriation by means of appropriation rate ψ . ψ ranges between 0 and 1. If the elite decide to appropriate the whole surplus

(1)

¹By assuming an exogenously given tax rate we actually assume that the rent-seeking rate is determined after tax rate, e.g. rent-seeking rate is determined in response to the exogenously determined tax rate. It is also imaginable to think about cases whereby the tax rate is chosen simultaneously with rent-seeking rate. Based on *total differential approach* employed in the proof of *Dorfman-Steiner theorem* the author could derive the condition of the simultaneous determination of tax rate, τ , and rent-seeking rate, ψ . Joint optimization yields the following condition: $\psi = -\eta / ((\epsilon_{Y_m t}) + 1)$, whereby η is the rent-seeking elasticity of the revenue of the state elite and $\epsilon_{Y_m t}$ is the tax elasticity of manufacturing sector output. Despite joint optimization of the tax and rent-seeking rates, in this chapter we shall not concentrate on this issue and assume an exogenously given constant tax rate.

²This is of course a simplification because the state budget has a much more complex revenue and expenditure structure. Nevertheless this simplification is by no means a contradiction to the real budget and has no impact on the level of the generality of the model.

³Cf. Chapter 3.

then $\psi = 1$ and if there is no illicit appropriation ($I^{var} = 0$) then $\psi = 0$. The ruler maximizes its rent over ψ .

$$Surplus = Y_m(\psi) \cdot \tau + R - \bar{C}$$

$$I^{var} = \psi [Y_m(\psi) \cdot \tau + R - \bar{C}] \quad (2)$$

$$Z = \max_{\psi} \psi [Y_m(\psi) \cdot \tau + R - \bar{C}] \quad (3)$$

In the optimum of the state elite the FOC must equal zero as shown in the following equation:

$$\frac{\partial Z}{\partial \psi} = \frac{\partial Y_m}{\partial \psi} \cdot \tau \cdot \psi + Y_m \cdot \tau + R - \bar{C} = 0 \quad (4)$$

From (4) we can find this point, e.g. the point from which the further increase of the rent-seeking rate causes a decline of Z. This is the optimum where the so-called Laffer-effect occurs.⁴

If we put $(Y_m \cdot \tau + R - \bar{C})$ on the right hand side and divide both sides by τ we get the following expression:

$$\frac{\partial Y_m}{\partial \psi} \cdot \psi = \frac{-Y_m \cdot \tau - R + \bar{C}}{\tau} \quad (5)$$

Dividing both sides by Y_m yields *rent-seeking elasticity of manufacturing*, $\varepsilon_{Y-manufacturing}^{\psi}$.⁵ In general, $\varepsilon_{Y-manufacturing}^{\psi}$ shows the responsiveness of manufacturing output to the changes of the rent-seeking rate, ψ . But in our case it is not just rent-seeking elasticity of the manufacturing output, it is the response, e.g. decline of the manufacturing output as a reaction to the marginal variation of ψ in the so-called “optimum” of the state elite.⁶

⁴If we would calculate $\frac{\partial Z}{\partial \psi} = \frac{\partial Y_m}{\partial \psi} \cdot \tau \cdot \psi + Y_m \cdot \tau + R - \bar{C} > 0$ then it would be the condition for the “left” side of the Laffer curve. Varian (2003) for example derives $\frac{\partial S}{\partial w} \frac{w}{S} > \frac{1-t}{t}$, whereby $\frac{\partial S}{\partial w} \frac{w}{S}$ is the elasticity of labor supply and w is the wage rate. He interprets this condition as follows: “We have shown that the Laffer effect can only occur if the elasticity of labor supply is greater than $\frac{1-t}{t}$.” Here in our case we are not looking for the “right side” of the Laffer curve but only for the “optimal” point where Laffer effect occurs.

⁵This kind of operations are totally unproblematic in microeconomics. Varian (2003), p. 273 even emphasizes that “...the derivative formulation is the most convenient way to think about elasticity”.

⁶ $\varepsilon_{Y-manufacturing}^{\psi} = \frac{\partial Y_m}{\partial \psi} \frac{\psi}{Y_m}$

$$\frac{\partial Y_m}{\partial \psi} \frac{\psi}{Y_m} = -1 - \frac{R - \bar{C}}{Y_m \cdot \tau} \quad (6)$$

Equation (6) shows that larger resource revenue, R , corresponds with a higher $\varepsilon_{Y\text{-manufacturing}}^\psi$ and consequently stronger deindustrialization. This means that at the ruler's optimal rate of ψ^* , the Laffer effect occurs at a point where the manufacturing sector declines $\left(-1 - \frac{R - \bar{C}}{Y_m \cdot \tau}\right)\%$ and this is more than the case without resource revenues, where $R = 0$ and corresponds with the following RHS $\left(-1 - \frac{-\bar{C}}{Y_m \cdot \tau}\right)\%$.

Let's assume that there are three identical economies, A, B and C consisting only of manufacturing sector with the same output of 100 units of manufacturing production, tax rate of 0,25, expenditure of 20. Suddenly B and C discover oil reserves and start exports. B generates R of 100 and C of 200 units. Now let us calculate how $\varepsilon_{Y\text{-manufacturing}}^\psi$ changes as a reaction to oil revenues and compare B and C with A where there is still no oil revenues.

$$\left(\varepsilon_{Y\text{-manufacturing}}^\psi\right)_A = -1 - \frac{0 - 20}{0,25 * 100} = -0,2$$

$$\left(\varepsilon_{Y\text{-manufacturing}}^\psi\right)_B = -1 - \frac{100 - 20}{0,25 * 100} = -4,2$$

$$\left(\varepsilon_{Y\text{-manufacturing}}^\psi\right)_C = -1 - \frac{200 - 20}{0,25 * 100} = -8,2$$

In A without oil revenues the ruling elite would increase rent-seeking rate ψ till the threshold where one percentage increase of ψ causes a 0,2 percentage decrease of the manufacturing output. In B this threshold increases and reaches -4,2 due to the oil revenues and in C where the oil revenues are two times as much as in B: the ruling elite increases ψ till the threshold where one percentage increase of ψ would causes 8,2 percent decrease of the manufacturing output. This means in the same time that in the optimum one per cent increase of the rent seeking rate, ψ , causes -0,2 per cent shrinkage of Y_m in A, -4,2 per cent shrinkage in B and -8,2 per cent shrinkage in C. We see that manufacturing in C suffers more than in B and in B more than in A. Larger resource revenues correspond with bigger losses for the manufacturing sector. To show this more formally we calculate the limit of $\left(\varepsilon_{Y\text{-manufacturing}}^\psi\right)$ if resource revenues tend towards infinity:

$$\lim_{R \rightarrow \infty} \left(-1 - \frac{R - \bar{C}}{Y_m \cdot \tau} \right) \rightarrow -\infty \quad (7)$$

(7) implies that if the amount of the nonrenewable resource revenues tends towards infinity then the decline of the manufacturing sector would be infinitely large. Economically nevertheless this decline cannot exceed (-100%): 1 per cent increase of $(\varepsilon_{Y-manufacturing}^\psi)$ cannot inflict a decrease of the manufacturing more than its total output. A decline of 100 per cent means that the manufacturing sector not only diminishes but vanishes totally.

Not less important is the result regarding the tax revenues. From (6) we see that larger tax revenue generated in the manufacturing sector causes the opposite effect and neutralizes the negative effect of the resource revenues on the manufacturing sector. If tax revenue approaches infinity then the negative effect of R on $(\varepsilon_{Y-manufacturing}^\psi)$ is totally neutralized:

$$\lim_{\tau Y_m \rightarrow \infty} \left(-1 - \frac{R - \bar{C}}{Y_m \cdot \tau} \right) \rightarrow -1 \quad (8)$$

So the manufacturing output decreases more as a reaction to the existence of resource revenues (R) and less if the state expenditure is higher (\bar{C}). If $R = \bar{C}$ then $(\varepsilon_{Y-manufacturing}^\psi)$ equals (-1) , i.e. the state elite in its optimum increases rent seeking rate, ψ , only till the threshold whereby manufacturing output shrinks only one per cent. If there is large resource sector and $R > \bar{C}$ then $\varepsilon_{Y-manufacturing}^\psi$ would be larger than (-1) . This implies that the shrinkage of the manufacturing sector in the optimum would be more than 1 per cent.

If we assume that the ruler knows how elastic the manufacturing sector would react to the increased rent-seeking then he chooses a rent-seeking rate, ψ , whereby corruption rate would be increased only till the threshold where the revenue increase from the higher rent-seeking rate is higher than the decrease caused by the contraction of the manufacturing sector.

The reason why the resource revenues cause the ruler to choose a corruption rate that is higher than in the case without resource revenues is again the elasticity. But this time the elasticity of the resource revenues. Resource revenues cannot react elastically to the human action because the amount of oil or gas in the bowels of the earth depend only on geographic determinants. This point is the distinctive feature of our model because the external character of R allows us to conclude

about cause and effect relationship between rent-seeking and resource abundance. *Xeni Dassiou* from the City University of London worked thoroughly on the alternative interpretation of Dorfman-Steiner model using intensively the notion of elasticity she writes in Dassiou (2004): “The important implication of this demonstration is that the level of advertising is chosen simultaneously with the level of price, there is no cause and effect relationship between these two variables.” Predetermination of the riches in the interior of the earth changes this and yields very good result for the formalization of the rentier state.

Now let’s turn to the expenditure side. Formally the relationship between expenditure C and rent-seeking elasticity of the manufacturing output can be shown by means of the following relationship

$$\lim_{\bar{C} \rightarrow \infty} \left(-1 - \frac{R - \bar{C}}{Y_m \cdot \tau} \right) \rightarrow 0^7 \quad (9)$$

In words, if the expenditure side of the state treasure is higher then manufacturing sector would suffer less than in the case with less expenditure. This is so because if \bar{C} increases then the surplus expressed in (1) tends towards zero and with surplus of zero even a rent-seeking rate of 1, e.g. $\psi = 1$, yields no result because surplus multiplied by the rent-seeking rate ($\Omega \times \psi$) equals zero. We conclude that a large expenditure side dams up de-industrialization. We shall see in the in the over next subsection, 4, that in the model whereby the expenditure side increases as a reaction to the rent-seeking tendencies the negative effect of the increasing export revenues and consequently higher rate of rent-seeking is more constrained.

4. *Elasticity Model with Tertiary Sector*

In the last subchapter we analyzed an economy with only two sources of revenue. These were the tax revenues generated in the manufacturing sector and export revenues from the mining sector. Now we augment the above presented model and assume that in the economy there is also an additional third sector which also generates tax revenue. This could be for example a tertiary sector.

⁷ $\lim_{\bar{C} \rightarrow \infty} \left(-1 - \frac{R - \bar{C}}{Y_m \cdot \tau} \right) \rightarrow 0$ is mathematically false because formally $\lim_{\bar{C} \rightarrow \infty} \left(-1 - \frac{R - \bar{C}}{Y_m \cdot \tau} \right) \rightarrow +\infty$ nevertheless the reaction of the manufacturing sector to one per cent increase of the rent-seeking does not cause growth of the manufacturing sector at least in the framework of this model.

We denote the output in the tertiary sector by Y_s and tax revenues generated in this sector as a product of Y_s and tax rate, τ .⁸ That's why now equation (1) has the following form

$$Surplus = Y_m(\psi) \cdot \tau + Y_s(\psi)\tau + R - \bar{C} \quad (10)$$

The target function now has the following form:

$$Z = \max_{\psi} [Y_m(\psi) \cdot \tau + Y_s(\psi)\tau + R - \bar{C}] \cdot \psi \quad (11)$$

(11) can be rearranged to the following expression:

$$Z = \max_{\psi} [Y_m(\psi) \cdot \tau\psi + Y_s(\psi)\tau\psi + R\psi - \bar{C}\psi] \quad (12)$$

FOC:

$$\frac{\partial Z}{\partial \psi} = \frac{\partial Y_M}{\partial \psi} \cdot \tau \cdot \psi + Y_m \cdot \tau + \left[\frac{\partial Y_s}{\partial \psi} \cdot \tau \cdot \psi + Y_s \cdot \tau \right] + R - \bar{C} = 0 \quad (13)$$

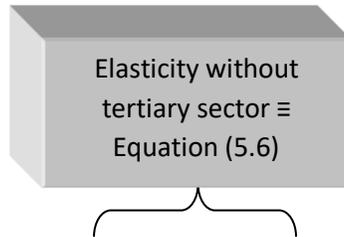
In order to confront the cases with and without tertiary sectors the elements of (13) generated due to the augmentation of the model by tertiary sector are written in red.

$$\frac{\partial Y_M}{\partial \psi} \cdot \tau \cdot \psi = -Y_m \cdot \tau - \bar{R} - \left[\frac{\partial Y_s}{\partial \psi} \cdot \tau \cdot \psi + Y_s \cdot \tau \right] + \bar{C} \quad (14)$$

$$\frac{\partial Y_M}{\partial \psi} = -\frac{Y_m}{\psi} - \frac{\bar{R}}{\tau\psi} - \left[\frac{\partial Y_s}{\partial \psi} + \frac{Y_s}{\psi} \right] + \frac{\bar{C}}{\tau\psi} \quad (15)$$

$$\frac{\partial Y_M}{\partial \psi} \cdot \frac{\psi}{Y_m} = -1 - \frac{\bar{R} - \bar{C}}{\tau\psi} \cdot \frac{\psi}{Y_m} - \left[\frac{\partial Y_s}{\partial \psi} \cdot \frac{\psi}{Y_m} + \frac{Y_s}{\psi} \cdot \frac{\psi}{Y_m} \right] \quad (16)$$

Rearrangements of (13) in (14), (15) and (16) yield (17). Up to the last term of (17) written in red, (17) is identical with (6) describing $(\varepsilon_{Y-manufacturing}^{\psi})$ for the case without tertiary sector. This means that the augmentation of the model by tertiary sector changes the responsiveness of the manufacturing sector by $\left(-\left[\frac{\partial Y_s}{\partial \psi} \cdot \frac{\psi}{Y_m} + \frac{Y_s}{Y_m} \right] \right)$.



⁸Like in the previous model we assume that tax rate is exogenously given and is constant.

$$\varepsilon_M = \frac{\partial Y_M}{\partial \psi} \cdot \frac{\psi}{Y_m} = -1 - \frac{R-\bar{c}}{\tau \cdot Y_m} - \left[\frac{\partial Y_S}{\partial \psi} \cdot \frac{\psi}{Y_m} + \frac{Y_S}{Y_m} \right] \quad (17)$$

Elasticity with tertiary
sector

The LHS of (17) is the elasticity of manufacturing output in respect to rent-seeking rate, ψ . This expression shows again how many per cent manufacturing output declines in the optimum if rent-seeking rate in the economy increases one per cent.

Knowing the sign of $\left[\frac{\partial Y_S}{\partial \psi} \cdot \frac{\psi}{Y_m} + \frac{Y_S}{Y_m} \right]$ could shed the light on the impact of the tertiary sector on the responsiveness of the manufacturing sector on the existence of an additional productive sector yielding tax revenue. For this let us look at the components of $\left[\frac{\partial Y_S}{\partial \psi} \cdot \frac{\psi}{Y_m} + \frac{Y_S}{Y_m} \right]$.

We assume that implementation of the rent-seeking has negative or no effect on the output of the services sector. An increase of rent-seeking and corruption could increase demand for luxury goods and services because of the higher wealth concentration as a result of the rent-seeking. But this effect is surely overcompensated by the decline in the most of the services which are not closely linked to the luxury. That's why we assume that $\frac{\partial Y_S}{\partial \psi} \leq 0$. Rent-seeking rate, ψ , and the quantity of output in the manufacturing sector, Y_m , both have a positive sign. Hence, $\frac{\psi}{Y_m}$ also have a positive sign. The product of $\frac{\partial Y_S}{\partial \psi}$ and $\frac{\psi}{Y_m}$ is therefore negative. $\frac{Y_S}{Y_m}$ has a positive sign as both Y_S and Y_m have a positive sign. We have a sum of a negative $\frac{\partial Y_S}{\partial \psi} \cdot \frac{\psi}{Y_m}$ and positive $\frac{Y_S}{Y_m}$ and that's why cannot tell whether the overall sign of $\left[\frac{\partial Y_S}{\partial \psi} \cdot \frac{\psi}{Y_m} + \frac{Y_S}{Y_m} \right]$ is positive or negative. If this term were positive then in accordance with (17), $(\varepsilon_{Y-manufacturing}^\psi)$ would increase otherwise $(\varepsilon_{Y-manufacturing}^\psi)$ would decrease. Increasing $(\varepsilon_{Y-manufacturing}^\psi)$ implies that manufacturing in optimum suffers more and a decreasing $(\varepsilon_{Y-manufacturing}^\psi)$ means that manufacturing is less responsive to the rent-seeking.

Now let us analyze when the condition $\left[\frac{\partial Y_S}{\partial \psi} \cdot \frac{\psi}{Y_m} + \frac{Y_S}{Y_m} \right] \geq 0$ is fulfilled. We can rewrite $\left[\frac{\partial Y_S}{\partial \psi} \cdot \frac{\psi}{Y_m} + \frac{Y_S}{Y_m} \right] \geq 0$ as $\frac{\partial Y_S}{\partial \psi} \cdot \frac{\psi}{1} \cdot \frac{1}{Y_m} \geq -Y_S \cdot \frac{1}{Y_m}$. If we multiply both sides by Y_m/Y_S we get the following expression

$$\frac{\partial Y_s}{\partial \psi} \cdot \frac{\psi}{Y_s} \geq -1 \quad (18)$$

As we already know the LHS of (18) is the rent-seeking elasticity of tertiary sector. And (18) shows that $\left[\frac{\partial Y_s}{\partial \psi} \cdot \frac{\psi}{Y_m} + \frac{Y_s}{Y_m} \right] \geq 0$ is given if one percent increase of the rent-seeking rate causes less than 1 per cent decrease of the output in the tertiary sector. *This implies that if tertiary sector is less responsive to the increasing rent-seeking tendencies then one percent increase of rent-seeking rate causes a larger decrease of the output in the manufacturing sector as a reaction to one per cent increase of rent-seeking.*

5. *Elasticity Model with Institutions*

In the countries with transparent revenue and expenditure, working anticorruption legislature and strong civil society implementation of the systematic and illegal rent-seeking activities corresponds with higher risks and high or even prohibitive costs. That's why in the societies with good institutional quality the risk of rent seeking tendencies is less than in the societies with no or weak institutions and low level of transparency. In this subsection we shall augment the above presented model with the assumption of increasing expenditure as a reaction to rent-seeking.

In the previous subchapters we assumed that \bar{C} is the expenditure side of the state treasure and that this amount encompasses all the necessary costs of the incumbent government to keep the social pressure so low that the probability of social unrest, demonstrations or revolution is not essential. Nevertheless, it is somehow unrealistic to assume a constant level of expenditure for all life situations. Especially if we assume that with the increasing resource revenues the level of rent-seeking increases. Increasing rent-seeking tendencies captured by ψ in our model imply additional costs because the realization of this new rent-seeking rate is not possible without transaction costs related to the appropriation of the rent. Political bargaining thoroughly discussed in the previous chapter is one example for increasing expenditure as the result of increasing rent-seeking. Especially in the societies with semi-democratic or democratic institutions the costs of realization of the rent-seeking strategy could be very high because of the high level of transparency, accountability and half-decent functioning anti-corruption legislature.

The mathematical implication is that the derivation of \bar{C} with respect to ψ is no more zero, e.g. $\frac{\partial \bar{C}}{\partial \psi} > 0$. As a result the FOC of the target function of the ruler has the following form:

$$Z = \max_{\psi} [Y_m(\psi) \cdot \tau \psi + Y_s(\psi) \tau \psi + R\psi - C(\psi)\psi] \quad (19)$$

$$\frac{\partial Z}{\partial \psi} = \frac{\partial Y_M}{\partial \psi} \cdot \tau \cdot \psi + Y_m \cdot \tau + \left[\frac{\partial Y_s}{\partial \psi} \cdot \tau \cdot \psi + Y_s \cdot \tau \right] + \bar{R} - \left[C + \frac{\partial C}{\partial \psi} \psi \right] = 0 \quad (20)$$

$$\frac{\partial Y_M}{\partial \psi} \cdot \tau \cdot \psi = -Y_m \cdot \tau - \left[\frac{\partial Y_s}{\partial \psi} \cdot \tau \cdot \psi + Y_s \cdot \tau \right] - R + \left[C + \frac{\partial C}{\partial \psi} \psi \right] \quad (21)$$

$$\frac{\partial Y_M}{\partial \psi} \cdot \psi = -Y_m - \left[\frac{\partial Y_s}{\partial \psi} \cdot \psi + Y_s \right] - \frac{R}{\tau} + \frac{C}{\tau} + \frac{\partial C}{\partial \psi} \frac{\psi}{\tau} \quad (22)$$

$$\frac{\partial Y_M}{\partial \psi} \cdot \frac{\psi}{Y_m} = -1 - \left[\frac{\partial Y_s}{\partial \psi} \frac{\psi}{Y_m} + \frac{Y_s}{Y_m} \right] - \frac{R-C}{\tau Y_m} + \frac{\partial C}{\partial \psi} \frac{\psi}{\tau} \frac{1}{Y_m} \quad (23)$$

If we compare (23) with (17) then it is clear that except the last term on the right-hand side the equations are identical. This gives us the opportunity to analyze the impact of the increasing costs on the rent seeking elasticity of manufacturing. For this we have to determine the sign of $\left(\frac{\partial C}{\partial \psi} \frac{\psi}{\tau} \frac{1}{Y_m} \right)$. All elements of this last term are positive and this is why we can conclude that a positive responsiveness of the costs as a reaction to increasing rent-seeking has a negative impact on the corruption elasticity of output.

6. Interpretation of the Results

In this paper, we put forward a theoretical model for the assessment of the magnitude of deindustrialization in the rent-maximizing equilibrium of the state elite. Based on a 2-sector elasticity model we show that the ratio of the oil revenue to tax revenue, $\left(\frac{R-\bar{C}}{\tau \cdot Y_m} \right)$, generated in the modern sector determines the impact of rent-seeking. This means that in a country with large industrial sector discovery of oil and gas fields and consequent exports of these resources would cause much less harm to manufacturing than in the LDCs with weakly developed industrial sector.

Harming manufacturing is a proxy for the importance of the non-oil business elites. In the context of the MENA region these are traders and baazaris. By inducing an optimal rent-seeking rate the state elites harm consciously the tax generating manufacturing sector for the sake of the economic empowerment of the state elite to economic elite. Huge revenues like in the Gulf States lead not only to the diminishing relative economic importance of the nonpetroleum sectors but also to the erosion of de facto political power of these sectors and their owners.

With the oil revenue boom, the hypothetical LDC suddenly receives export revenues which are for instance a tenfold of its non-oil GDP. Such a scenario would induce or at least enable the state elite to follow a policy neglecting the interests of the manufacturing sector which lost its importance as a revenue-generating sector in the eyes of the elites following “hit-and-run” tactics.

The elasticity model presented suggests an alternative explanation of the resource curse expressed in deindustrialization or conservation of industrial underdevelopment whereby the level of industrial development prior to boom determines the outcome of oil boom.

This could be the explanation why in the industrial countries like Australia, Canada, United Kingdom, Norway or the United States oil abundance do not induce adverse deindustrialization effects like in the LDCs. Even with large oil assets the share of oil and gas does not play that important role in revenue generation of the developed countries, as it is the case in the LDCs. In the most of the OPEC member states, oil-rich Sub-Saharan countries, Russia, Azerbaijan, Kazakhstan and Turkmenistan oil and gas is the most important export commodity constituting more than 60% of export revenue and 40% of GDP.

Further we analyzed deindustrialization pressure in a 3-sector framework and showed that if the sectors other than manufacturing and oil sector exist then they also have an impact on the pressure of deindustrialization in an oil-exporting country whereby this pressure depends on the responsiveness of these sectors to the variations of the rent-seeking rate, ψ . We scrutinized the augmentation of the 2-sector revenue generation model by additional tertiary sector and showed that if the tertiary sector declines less than 1% as a reaction to 1 per cent increase of the rent-seeking rate, ψ , then the existence of this sector increases deindustrialization pressure on the manufacturing sector. This result implies that diversification of the oil-rich economies focused on tertiary sector which is in the rule not very responsive, increases deindustrialization pressure on the manufacturing sector despite diversification efforts.

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