What is the Driving Force Behind Industrial Development in Iran? Rent Seeking and Labor Exploitation as the driving force of Industrial Growth

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Abstract

This article is a contribution to the theory and empirics of rent seeking, labor exploitation and industrial profitability. We measure the interest rate rent, labor exploitation and technological progress. The profitability and accumulation in industries is derived from a simple mathematical model. The interest rate rent and labor exploitation are two important factors of industrial growth in Iran. Also, the estimated profits of industries are very high which further industrial growth. We have estimated the variables in a panel of industrial sectors and proved a positive correlation between value added in industries and interest rate rent, exploitation and profitability, such that each one percent increase in interest rate rent causes value added to increase by 1.5 percent. We have extended the results to a debate on political economy of Iran and the economic history of the country and reached some conclusions regarding the devastation of Iranian industrial base in 18 and 19 century.

Keywords: Iran, interest rate rent, labor exploitation, profitability, industrial growth, large industrial firms.

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1- Introduction

This article is written in order to make a narrative assessment of the application of the classic economists' views on the issue of economic growth and their links to new economic issues. According to the classical economists, sustained growth is an outcome of saving and accumulation of capital as a result of reinvestment. On this basis the following questions are specifically raised: To what extent the stability of labor wages contributes to industrial growth? To what extend the accumulation of profit and capital contributes to growth? Could rent (on land, interest rates, etc.) or population growth impede growth and obstruct accumulation of investment? From new point of view the question is if other sources of profit such as rent or financial repression would contribute to growth.

Therefore, in this paper, clearly, the hypothesis statements are: 1) The stability of wages can contribute to economic growth. 2) Rent seeking is the main source of gaining profit and capital accumulation and in fact this is the most significant factor in Iran's industries.

To test the hypotheses first a simple theoretical model is derived, next using econometrics techniques, the interest rate rent, exploitation of labor force and profitability and efficiency of Iran's industrial sub-sectors are computed. The effort is made to maintain the independence of the analysis from current views and where there is reference to any, it is only for the sake of comparison.

According to two significant works by Tullock (1967) and Krueger (1974) the new issue of rent seeking and its impact on industrial development and growth, started in the developing countries, and thereafter a large number of articles on rent seeking were published. In economics 'rent seeking' is defined as a process that in which one individual or organization or agency tries to manipulate the economic environment, and gain material profit without performing any trade or creating value added[1]. These people try to extract uncompensated profit without bearing the cost or just with investing in rent seeking activities. They could come from the private sector or hold a public office, or might have ties to political power or government officials. Government official, in particular, could make regulations and

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1- http://n.wikipedia.org/wiki/rentseeking

apply monitoring rights, and with no productive effort, made a fortune by rent seeking in a short time.

The issue the government engaging in 'rent seeking' is discussed in some articles inside the country such as Midry (1994) , and an special issue on "rent seeking" in Culture and Reflection (fall 2004). These articles, basically, attend to the political economic aspect of the issue, and none have tried to measure the extent of the 'rent' and its impact on economic development and growth, international trade and labor market.

In this article an effort is made to measure the extent of 'rent seeking' in Iran's industrial sector based on a simple growth model. To this end a simple model is developed in section three of the article, from which a framework for interest rate rent, labor exploitation and profit is extracted. (In section two the related literature is briefly reviewed.) In section four a simple econometrics model is applied to measure the extent of 'rent seeking'. Along with estimation of interest rate rent, the amount of exploitation of labor force and profitability of industries is, also, calculated. It should be noted that profitability of industries in Iran has not been a topic of researchs, except for the work done by Moulaee (2004). Yet, his article does not include any statistics regarding profits of industries and he proxied a percentage of sales as profit. In this article economic profitability of the industries are estimated, not their accounting profit and these two must be distinguished. In fact economic profit in this article is included with interest rates 'rent' and exploitation of labor forces; however, it is possible to make a distinction. Also, in Iran, despite an extensive amount of literature that attempts to describe exploitation analytically, from a leftist view point, so far no research has been done to measure it, or at least we haven't found it. Furthermore, our search in foreign research sites to find articles that have measured exploitation was fruitless and there is no article about this issue. Therefore from the third section onward only empirical estimations are considered. Yet the issues discussed in this article could be used by researchers from schools of rent seeking, public choice, institutionalism, or Marxism and historical school. It could just as well benefit researchers of economic growth. It should be added that this study provides a background to utilize the rich collection of available data to measure implications of globalization or accession to World Trade Organization for Iran's industrial

sector. Moreover, the impacts of 'rent', exploitation and profitability on foreign trade and vice versa, could be measured. In addition, one could create a model for labor force market though, all these is beyond the capacity of one article. Thus, we will try to discuss these issues in two or more articles and we hope it will not create any misunderstandings.

Section four of the article is reserved for result calculations, and in the fifth section, an econometrics test to study the relations between 'rent seeking', exploitation, profit, and value added, is performed. In the sixth section, only the discussion and conclusions are presented and policy recommendations are left for the following articles. in section 7 conclusions is provided. Some suggestions on later research works are introduced in section 8.

2-Literature Review

Gordon Tullock (1967) discussed 'Rent seeking' as a phenomenon for first time in an article. He related the issue to monopolies. But the term 'rent seeking' was coined by Anne Krueger (1974). She says that in many market economies, government restriction on economic activities is an omnipresent reality of economic life. These restrictions lead to all kinds of 'rent seeking', to acquire of it people will compete. Sometimes the competition is quite legitimate and at other occasions it occurs as bribery, corruption, smuggling, and black market."

Then Krueger discusses 'rent seeking' in a General Equilibrium model, and applies that to the Turkish economy to measure the extent of 'rent seeking' originated from tariffs and import rationing. We will not refer to her article any more since this kind of 'rent seeking' could be measured in other articles.

The Palgrave dictionary defines 'rent seeking' as payment for using resources, such as land, labor force, equipments, ideas, even money. Labor force rent, or payment of rent to the labor is called 'wage'. Payment for land or equipment is rent and payment for ideas is called 'royalty'. Payment for money is called 'interest'. In economic theories payment for one resource that the extent of its usage in proportion to the amount of payment to it is high, , is 'rent' or 'Quasi rent' and it depends on the extent of usage in proportion to the payment, if the usage is temporary or permanent (Palgrave, 141). Ricardo, in particular, identifies 'rent' as the payment for land that is

gradually moving toward scarcity and its rent moves up and impedes economic growth (as there is no more profit to accumulate).

The discussion by Tullock is summarized in Palgrave and refers to welfare Triangles that are lost to monopolies; however, it must be noticed that what is redistributed from consumer to the monopolist producer, is not considered as net loss, because both sides belong to the same community.

Most of the issues of other foreign articles focus on this type of 'rent seeking'. Although, closer to the discussion by Krueger, Hillman and Katz (1984) have based their article on the concept of 'biddable rent' as defined by Bhagwati in a framework of monopoly and a risk avoiding 'rent seeking'. Applebum and Katz (1987) believe that in previous resources 'rent seeking' had been defined exogenously. But in a framework that individual (for instance in government) determines the 'rent' for her or his usage, 'rent seeking' is endogenously determined. In their article, they offer an analysis of interaction of regulations, agencies, and consumers as three self motivated groups.

Delorme, Kamerschen, and Mbaku (1986) make an elaborate reasoning that extensive government intervention in economy could lead to increase in social cost of monopoly. They take Cameron's economy as a case that government intervention in 1980's greatly increased and resulted in vast opportunity for 'rent seeking', thus the economic growth was halted.

Robert Looney (1989) states that military and repressive regimes in developing countries lead to an ultra conservatism that joins the military force, to repress free expression by people. At the other end, people seek 'rent' and it causes a decline in economic growth.

The most recent collection of articles and research works that are published in a book on 'rent seeking' and it impacts on economic development is edited by Mushtaq Khan and K.S. Jomo (2000). In the introduction the editors articulate that one should not perceive that 'rent seeking' is always negative (this will be discussed later in this article). The articles in the book include discussion of impacts of 'rent seeking' on economic development of Thailand (that Duner and Ramsay state they wonder how Thailand has succeeded to develop its economy in a corrupted context), Thailand's policy of bureaucracy and a new semi democracy (Michael T. Rock). There is an article on corruption and political economy

as related to political privileges of especial groups and social segments in Philippine (Paul D. Hotchcroft). Another article is on monetary policy, 'rent seeking' and economic practice in Indonesia (Jomo and Gomez). Finally, there is a study of 'rent seeking' in monetary sector in Malaysia (Kok Fay and Jomo).

Articles published on 'rent seeking' in Iran, include one by Abrishami and Hadian (1383). They offer an endogenous growth model to study the relationship between 'rent seeking' and economic growth. Though, they admit that not being able to measure rent seeking obstructs performing any empirical study of impacts of rent seeking on economic growth. This has caused the researchers to apply different proxy variables. In this article they use average rate of tariffs, the difference between exchange rates in formal and black markets and the size of the government as the substitute for 'rent seeking' activities and show that the impact of these variables on economic growth in Iran between 1959-2001 has been negative.

Khezry and Renani (2004) also have offered a study of rent seeking and its cost as one of the essential cause, in a country like Iran, to remain less developed.

But beside these articles, which are also not related to our topics, there are no other papers to develop straightforwardly the interest rate rent and exploitation and measure them. For example, a search in Science Direct data base on labor exploitation shows that there is no any paper on this subject. And although the search on 'Interest Rate Rent' as keywords show 1670 paper, neither of them is related to measuring interest rate rent. When we use the keywords 'Extracting Rent From Banks', which is the main topic of this paper, there are only 6 papers, Hans Degryse, Steven Ongena(2008), which is due to the rents which bank extracted not the rent extracted from bank and monetary system and related to banks competition and regulation.

Pieter Klaassen, Idzard van Eeghen(2009) is another paper which try to measure the capital component and then proceed to model risk of credit and banking. Stefan Günther, Marco Rummer(2006) focuses on the hot-issue market in Germany, which was characterized by a high number of initial public offerings (IPOs) and extreme levels of underpricing. In particular, using different cross-sectional regressions they show that investor sentiment and agency conflicts were the determinants of high underpricing as opposed

to traditional explanations with regard to ex-ante uncertainty. Additionally, using a VAR(4) model, we illustrate that more firms tend to go public following months of high underpricing. Finally, analyzing the descriptive statistics they suggest that the higher the underpricing, the poorer the subsequent performance of the IPO, supporting the leaning against the wind hypothesis. Clearly this is the paper that to some extend resemble our paper but the subject matter is underpricing not interest rate rent. The other 3 paper by Mark F. Hornick, Erik Marcadé, Sunil Venkayala (2007), Geoffrey Poitras(2002), and Timothy Mullen et al.(2004), are the 3 other papers which is much more remote from our subject and are more related to securities and derivatives and the rent that is extracted by this types of instruments, again not related to measuring rent extracted from banks.

Note that these articles are part of books and are not independent papers which published in journals. Therefore once again we repeat that there is no any paper near our work to mention and review in the literature.

3-Theoretical Model

We assume the firms in industrial sectors act in competitive environments. In other words, the economic profit in these circumstances equals to zero. This could be demonstrated as:

$$P_t A_t k_t^{\alpha} L_t^{1-\alpha} = r.K + w.L \tag{1}$$

In this relation:
$$Q_t = A_t k_t^{\alpha} L_t^{1-\alpha}$$

Is the production function (Q) as developed by Cobb-Douglas, K stands for capital input, L stands for labor force input, A is Coefficient of Total Factor Productivity, r stands for the cost of capital services (interest), W stands for labor force wage, and t for time. Also:

$$TC = rK + wL$$

which shows the total cost. Since the market is assumed to be competitive, total revenue (PQ) equals to Total Cost (TC). Differentiating both sides, we have:

$$PQ(\dot{P} + \dot{A} + \alpha\dot{K} + (1-\alpha)\dot{L} = rK.\dot{K} + wL.\dot{L} \tag{2}$$

Here it is assumed that wage (w) and interest rate (r) are constant and point over variables show the growth rate of the variable. Now, if we divide both sides by PQ, we find:

$$\dot{P} + \dot{A} + \alpha\dot{K} + (1-\alpha)\dot{L} = \frac{r.K}{PQ}.\dot{K} + \frac{wL}{PQ}.\dot{L} \tag{3}$$

In which $\dfrac{rK}{PQ}$, $\dfrac{wL}{PQ}$, are respectively, the shares of capital and labor in total revenue (output) that we take to be equal to α and 1-α . Then:

$$\dot{P} = \alpha\dot{r} + (1-\alpha)\dot{w} - \dot{A} \tag{4}$$

It should be noted that $\dot{P}$ is the growth rate of the price in any time period and does not breach the assumption of a constant price for the producer (in a competitive market). Now if we assume the market as competitive, then P=MC or the price would be equal to marginal cost. Then:

$$M\dot{C} = \alpha\dot{r} + (1-\alpha)\dot{w} - \dot{A} \tag{5}$$

Or

$$dLnMC = \alpha dLnr + (1-\alpha)dLnw - dLnA \tag{6}$$

And

$$MC = \frac{r^{\alpha}.w^{1-\alpha}}{A} \tag{7}$$

And assuming a competitive market and considering Cobb-Douglas Function:

$$TC = MC.Q = (rK)^{\alpha} (wL)^{1-\alpha}$$

Now, we take this framework to calculate the profit, the interest rate rent, and the exploitation of labor force. In this function r stand for interest rate, W stands for wage, and α is a coefficient of the Cobb-Douglas Production Function with constant return to scale. On this basis two types of total cost could be computed. First, instead of r, the marginal production of capital or average output Q/K that is extracted from production function is substituted. Therefore:

$$TC_1^K = \left(\frac{Q}{K}.k\right)^{\alpha}.(w.L)^{1-\alpha} \tag{8}$$

Then the total cost is calculated according to the current rate of interest in banking system:

$$TC_2^K = (r.K)^{\alpha}.(w.L)^{1-\alpha} \tag{9}$$

In this case, the difference between TC_1 and TC_2 is equals to the rent on interest rate.

$$TC_1 - TC_2 = RentR \tag{10}$$

It should be noted that in the time period of study (1989-2002) interest rate rent is resulted from the difference between natural interest rate (or marginal efficiency of capital or marginal product of capital) and the current interest rate. In other words, the difference between marginal product of capital and the paid interest is the interest rate rent.

In the second phase these exact operations are performed for wage and marginal product or average product of labor:

$$TC_1^L = (r.K)^\alpha \cdot \left(\frac{Q}{L}.L\right)^{1-\alpha} \tag{11}$$

$$TC_2^L = (rK)^\alpha (wL)^{1-\alpha} \tag{12}$$

And we get:

$$TC_1^L - TC_2^L = ExploitL \tag{13}$$

It is reasoned that over the studied period, the exploitation of labor force is an outcome of the differences between the paid wage to the workers and the marginal or average product of labor. In third phase, we extract the economic profit out of the following function:

$$\pi_{econ} = Valadd - (\frac{Q}{K}.K)^\alpha \cdot (\frac{Q}{L}.L)^{1-\alpha} \tag{14}$$

In function (14) Valadd is the value added. We understand that value added is divided among the labor force (wage), and the capital (interest rate) and the rent of land, and profit. We leave out the third one, because it is implied in the value added and we do not have an analysis to offer for that, because our information site in Iran's industrial sector provides no statistics on paid land rent.

In fact industrial firms pay a smaller cost for capital services than the real market rate for capital, and what the marginal product of capital indicates. They exploit the discrepancy between capital cost and the product of capital and allocate that to themselves as rent.

At the other hand, the firms pay a lower wage to the labor force than, otherwise, would be determined by the marginal product of labor. They allocate this profit -originated from exploitation of the labor force- to their own benefit, because they pay a wage that is less than the marginal product of labor, just as the interest they pay to the banking system is less than marginal product of capital.

Notice that economic profit could be computed using two different formulas. For instance, in function (14) instead of Q/K and Q/L we could respectively put r and w and obtain a different π_{econ}. We do not do that, because we would like to obtain the net profit out of rent seeking on interest rate and labor force wage. Accumulation of these two that are turned to the owner of industry allows him to gain a larger profit. This factor and its impact on growth will be analyzed in section five.

4-Estimation of Production Function and Related Computations
4-1- Data base

All the data related to industrial sub-sectors or large industrial firms are obtained from Iran's Center for Statistics. In this site the value added, investments, compensation of workers services, the volume of labor force, the number of firms, the percentage of required imported raw material, and production value are provided. The time series of capital assets are computed by Perpetual Inventory Method. Interest rate data are from central bank of Iran. Industrial sub-sectors as defined by ISIC (International Standards Industrial Classifications) coded from 31 to 39 include:

31- Manufacture of Food, Beverages and Tobacco

32- Textile, Wearing Apparel and Leather Industries

33- Manufacture of Wood and Wood Products, Including Furniture

34- Manufacture of Paper and Paper Products, Printing and Publishing

35- Manufacture of Chemical, coal, rubber, Plastics with the exception of petroleum and Gas

36- Manufacture of Non-Metallic Mineral Products, except Products of Petroleum and Coal

37- Basic Metal Industries

38- Manufacture of Fabricated Metal Products, Machinery and Equipment

39- Miscellaneous Manufacturing Industries

4-2- Methodology of Estimation

The most important estimation in this article is estimation of coefficients of Cobb Doulglas' Production Function. To do this, a panel of

the above industries is arranged and production function is estimated using Random Effect Method because, Hausman statistics confirm this. As for the estimation, the number of labor force per year (annual employment), the capital stock and the value added in each subsetor is used. Estimation of Cobb Douglas Function is:

$$q = -2.68 + 0.44k + 0.62l$$

$$R^2 = 0.84 \quad N=9 \quad T=27 \quad H=2.238 \quad (P\_val=0.32) \tag{15}$$

In relation (15) all the variables are in terms of lgorithms (**q**, k, l, value added, capital, and labor force) and the numbers in parenthesis are t-statistics. As observed the sum total of the coefficients is equal to (0.47+0.6=1.07) that is very close to 1. Therefore, we have constant return to scale production function. For the industrial sub-sectors Moulai (1383) and Nafar (1380) have estimated some production functions that because of differing methodology, differ from our estimated coefficients.

To obtain the TFPs (total factor productivity) for each sub sector, we solve the model to obtain them for each sub sector(considering the random effects). Thus, the TFP series are found. In order for the relation to be stable and not to breach the main assumptions of the model, the shares of the **K** and **L** are respectively assumed to be 0.4 and 0.6 that is, in relations (1-14), α is assumed to be 0.4. With this amount of α, total cost, rent, labor exploitation and profit are computed.

4-3- Interest Rate Rent

In figure (1) interest rate rent for 9 industrial sub-sectors are reported as they are computed as a ratio of total cost when computed with Q/K, to the total cost when computed with r. Regretfully, the statistics of the interest rate was available only for post 1989, and despite the fact that production function was estimated for 1974-2002 the rent is reported only from 1987 onward. It should be noted that instead of the wage, the average payment to the labor force in one year is used. This might raise some criticism, but it should be noted that no measure on labor force wages in industrial sectors are published, and also, using time series indices of construction workers' wages that the Central Bank publishes annually, doesn't resolve the problem

And in particular, it hides the differences among the sub-sectors and leads to biased results. This is true about the labor force exploitation and interest rate as well.
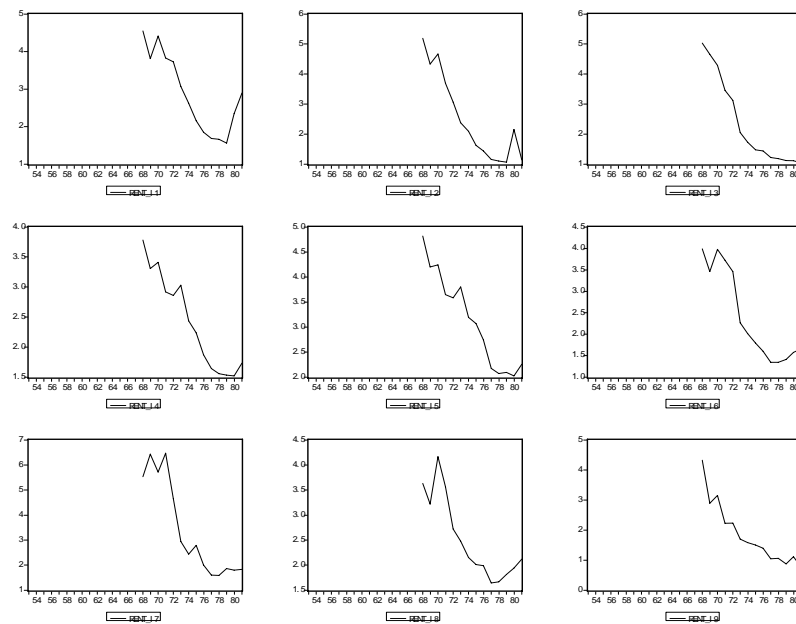

Figure (1)- Interest Rate Rent in Iran's industrial sub-sectors (31-39 ISIC that are specified as 1i – 9i)

As the figure(1) shows, about the end of 1980's, the coefficient of interest rate rent sometimes reaches more than 4^1, but since the beginning of the 1990's generally it has declined in all the industries and by 2000 it has reached its lowest amount. From 1990 banking interest rate was gradually revived and in 1990's it took a growing trend. On the other hand, from 1994 onward a monetary crisis in Iran started and efficiency took a decreasing trend and, also inflation intensified in 1995 and 1996 (in computation of

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1- Some may criticize the authors on the basis that these figures reflect high efficiency of capital, not high rent. Yet this reasoning does not withstand the fact that, often, in these years, both efficiency and production have been declining.

rents and interests, real wage is introduced and the capital stock and the value added are in real values, but the amounts of rents are not modified on the bases of price indices, because rents and economic profits have been channeled to the industry owners). Later on, the inflation rates were controlled and the amount of rents, also declined. Only in some industries in 2001 and 2002 the amount of rents started to increase again. These estimations show why the banking system is under pressure to pay loans. It is unclear how much the monetary repression of the banking system that continued since 1980, to relegate its own funds to the government, and the economic sectors, as rents, has contributed to the accumulation of capital and economic growth. A glance at the figures shows that the amount of interest rates rent in 1991 was in its peak. This coincided with the peak of imports to Iran during the first development program. According to the data provided by the Customs Office the amount of imports reached $30 billion in 1992-3. In these years imports with the usance credit helped the industries to obtain large amount of raw materials and semi-finished parts and a large amount of rent was gained by the importers and industry owners because of the differences between the formal exchange rates and the black market exchange rate. From the 1994 crisis onward the growth of imports were ceased, and when the exchange rates unified , perhaps decreased exchanged rate rent, and it also could justify the drop in the interest rate rent, because in all those years, the industries had transferred imported intermediate commodities to consumer goods. The analysis of the effects of these issues on industrial growth will be left to future articles.

4-4 Exploitation of Labor Force

In figure (2) the exploitation of labor force for 9 industrial sub-sectors are displayed as ratios of two possible final costs shown in relations (11) and (12). Here, the exploitation figures demonstrate a different move other than the interest rate rent. As it is observed starting late 1980's, the industries have been able to increase the speed of exploitation of labor force, but almost from 1992 onward the exploitation of labor force has began to decline and in some industries such as sectors 34 and 39, it has dropped to less than one. In the other industries and other years the ratio is greater than one. For industries such as sector 35 (chemical products) and also, sectors31, 36, 37, 38, it is always greater than one. Even in textile industries that nowadays is

experiencing a crisis, the rate of labor exploitation is greater than one. This is another source of capital accumulation and growth for the industrial sector.
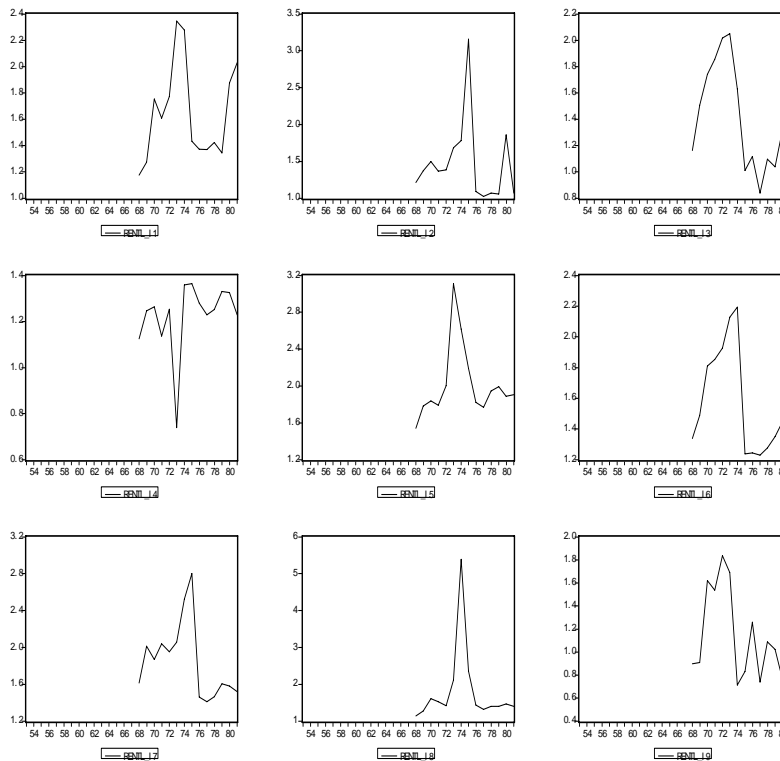

Diagram 2: the rate of labor force exploitation in Iran 'Industry

In the entire period of 1974 to 1979, and sometimes till 1982, the real wage has an ascending trend and in 1980's there are fluctuations. But, the entire decade of 1990, because of the high inflation, the real wage had gravely decreased. Despite this we see that the rate of exploitation has, also decreased that, of course, the real cause is a decline in production (see the figures in annexes of paper). In any case the declining rate of exploitation, under any condition, hasn't benefited the labor because at the same time the living standard of the workers has dropped. This phenomenon is not surprising because payment of higher wage to the labor is only possible

through seeking rent on interest rate and an increase in the labor exploitation. Hence, computation and analysis of this article is closely related to Marx's analysis of capitalist system. According to his analysis there is a reserved army of unemployed that essentially constitutes lumpen proletariats and is, always, acting as an impediment to wage increase and can contribute to accumulation of capital derived from the exploitation. Yet, it should be noted that our analysis has two other sides: rent and 'extra economic profit' that could be derived from monopolization or 'Mark up Pricing'. Either way, annual payment to the workers in real price, for the entire decade of 1990's and early 2000's was lower than its historical rate in 1980's, but higher than what was paid in 1974. But, in two years (1995 and 1996) the real wage was even less than 1974. (see the figures in annexes of paper).

4-5- Economic Profit

As it was discussed earlier, pure economic profit aside from the interest rate rent and the labor exploitation is computed and shown in figure (3). It is noticeable that profit behavior matches up with the general information that we have on these sub-sectors. It is observed that toward the end of 1980's till early 1990's that are the Era of Reconstruction and the First Development Program, profits have, generally, had an upward trend, but starting 1993 or 1994 onward it has reversed to a downward trend and only in sectors 31, 32, 34, 35, 36, and 38 from 1997 onward an increasingly upward trend is shown. Notice that in this case the performance of sector 35 that includes petrochemicals is very favorable (we know most of the firms in this sector belong to the government). But, the Basic Metal Sector (37) doesn't show a similar trend. These profit data match up to what Naser Khiabani(2008) in his General Equilibrium Model on reducing tariffs in different sectors, and their impact on production, exports, imports, and employment of them has obtained. According to the results of his model, the Food Sector (31) is in positive conditions. While, his results demonstrate that the Basic Metal Sector (37) once liberalized, won't face a very favorable condition, regarding either the production or the employment. Sector 38 also has been able to regain its profitability since 1996 onward, but sector 39 has faced losses and the main factor behind which, is the decline in the value added in this sector.
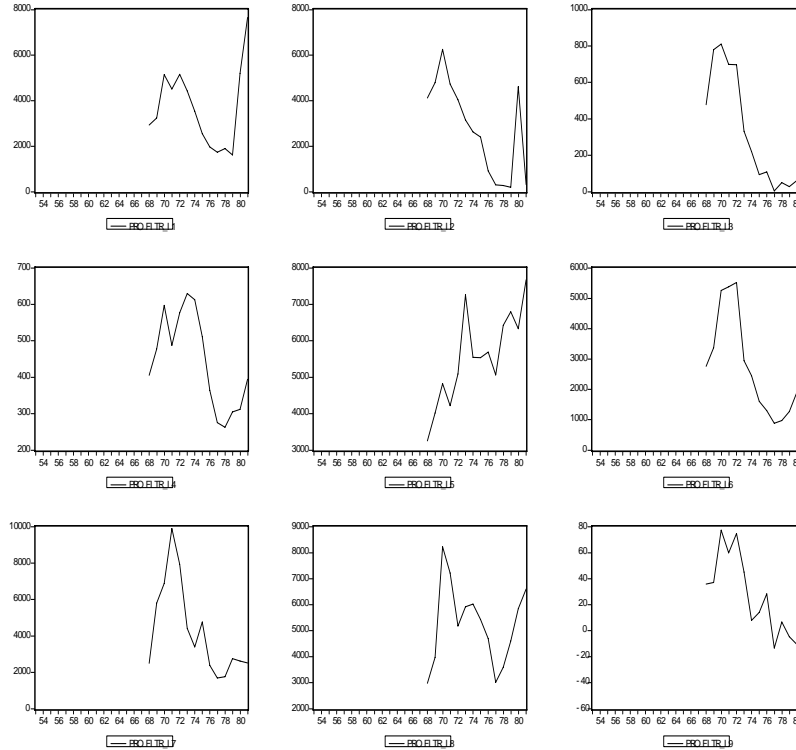
Diagram 3: Profitability of Iran's industrial sub-sectors

5-The Relationship among growth, interest rate rent, exploitation and profits

In order to set the results we obtained in section four in an analytical framework, the industrial production, with interest rate rent, exploitation and profits, are set in an econometrics model:

$$q_{it} = \beta_0.\text{RentK}_{IT} + \beta_1.\text{exploit}_{it} + \beta_2\,\text{Profit}_{it} + \beta_3.l_{it} + \beta_5.k_{it} + \varepsilon_{it} \qquad (16)$$

This relationship is in fact the same thing as 'Production Function' in which 'interest rate rent' (RentK), 'labor force exploitation' (exploit) and 'profit' (Profit) are introduced, alongside K and L. All the variables are in

terms of logarithms, and we expect that all the βs to be positive. The relation (17) is estimated using the Algorithm of 'Seemingly Unrelated Regression (SUR)'. Some interesting results are observed:

$$q_{it} = 1.52\,\mathrm{Re}\,ntK_{IT} + 0.08\mathrm{Exploit}_{it} + 0.05\Pr ofit_{it} + 0.1.l_{it} + 0.99k_{it} \qquad (17)$$

$$\quad\quad (59) \qquad\quad (5.39) \qquad (7.5) \qquad (7.64) \quad (56)$$

$$R^2 = 0.99 \qquad\qquad N = 9 \qquad\quad T = 14$$

Again, the interest rate rent, exploitation and profit have positive impact on the output (value added). It is observed with the exception of the growth of factors of production (K and L), the most impact on the value added is derived from interest rate rent, so that one percent increase on interest rate rent leads to 1.52 percent increase in the value added (it should be noted that all variable are in terms of logarithms, therefore the coefficients are interpreted as elasticities). The production elasticity to exploitation is equal to 0.08 (it means if the rate of exploitation is increased by one percent, the value added increases by 0.08). Profit has a smaller impact (%0.05). The second major impact on the value added arises from capital stock (for each one percent increase in capital stock, value added increases by 0.99 percent). In other words, once again the validity of the estimated coefficient of interest rate rent is verified. The industries draw low interest loans from the banking system to increase their capital stocks. In this production course, labor force has a smaller impact on output (with 0.1elasticity) that once more confirms a low coefficient for labor exploitation in the Production Function. Therefore, the general image is that the most important source of industrial growth in Iran has been the repression of monetary sector that at the same time has caused a high inflation and sometimes has contributed to the profits of the producers in terms of mark up pricing, and inflationary pricing. Furthermore, it is observed that despite the declining productivity in Iran's industry, the profit is kept up.

6-discussion and historical digression

First it was shown that the interest rate rent has been the most significant source of the industrial growth, and the exploitation of labor force is of lower level of importance. Hence, the article discussed that the monetary repression does not always lead to slowing down the growth,

which contradicts many suggested theories. This discussion might help researchers of the monetary system and throw a hypothetical question as to what extend growths of the monetary volume and control of interest rate could contribute to economic growth. Our belief is that this can not go on indefinitely, because, in one hand the fiscal system will be destroyed and at the other hand the high inflation harms the growth. To put it in different words, the exploitation of the fiscal system by the government should have its limitations. We observed that in 1990's the interest rate rent was rapidly decreased. This phenomenon was the result of the government reforms that with monetary and fiscal policies in 1980's had halted the economy. In fact the government faced more losses than gains. Unfortunately, after the reforms, all other sorts of 'rent seeking' by the government, economic firms, including public and private, and by private sector in its general sense started and the achievements of reforms were lost very rapidly and has resulted in extreme accumulation and concentration of wealth.

Second, the teachings of the classic economist about economic growth and development still stand full strength. Adam Smith divides the value added among wage, interest, rent, and profit. He defines the investor's profit as the only source of accumulation of capital that could maintain economic growth (because this is the only class that saves). Ricardo's analysis is more focused on the probability of halting the economic growth process as a result of increasing rent on high quality lands (that an increased rent could decline profit and saving, and consequently the investment). Marx finds exploitation of labor force to be the major source of capital accumulation, reinvestment and growth (if the wage is not raised to decrease the profit). In Marx's opinion if the rate of profit has a descending trend, the process of accumulation would halt. The economic development model of Marx could be interpreted such that the Lumpen Proletariat who is all are ready to do anything, is in the reserve army of the labor, could contribute to increased exploitation and profit and the next accumulation. In Marx's view the reserve army of labor, plays in the capitalist hand, which with repression of the genuine revolutionaries, postpones a revolution in the substructure of the production relations, and the consequent revolution in institutional superstructures and the cultural environment. At the same time this reserve army of the labor is the main impediment of a rise in wages. Arthur Luis

provides the Model of Unlimited Supply of Labor. He explains that keeping the wages constant at subsistence level contributes to accumulation of capital. This model also, belongs to the same class of analysis, as Marx's Theory.

Now one could apply these theories to Iran's industrial growth. The following questions could be raised:

1)   Could a ceaseless increase in labor supply –through population growth- help profit increases and accumulation remains constant?

In this regard the study of Iran's industrial growth proves mixed results. In one hand from 1974 to early 1980's because of the increase in petroleum 'rents', the real wages in industries moved up and at the same time, the production increased. In 1980's and over the war time, with a decline in capital stock per capita, nearing a critical border, the wages showed an irregular pattern of behavior. From late 1980's to early 1990's the real wage started to decline. This, up to some degrees, allowed the industries to grow rapidly (throughout the First Development Program). Some relate this rapid growth to abundance of imported capital and intermediate goods after taking heavy loans from foreign resources. In fact, here Adam Smith's analysis of a 'vent for surplus' that was completed with the work of Hlamint, in twentieth century, could be generalized to the industrial growth of this period, because the surplus labor force and production capacity had been activated through commerce (though not much on exporting commodities, but more through importing goods and exporting petroleum).

Therefore, through the period of industrial growth in 1990's and early 2000's one could apply Marx's model to explain the growth. In the two decades an abundance of labor force was supplied to the market and unemployment increased. Even though one must pay attention to the rapid growth of the volume of money and redistribution of welfare from consumer to producer, due to inflation -in addition to social cost of inflation- as another factor that came to rescue the industry. It is interesting to know that from early to mid 1990's the industrial value added declined and only in 2002 it was slightly compensated. But, throughout 1974 to 2002, in sector 35, the value added had always (with a little fluctuation) increased. The food industries have also in the two final years of the period could compensate for its dropped growth of 1990's and even rise beyond its historical era in 1992. This shows the policy switching in 1974 and 1975 toward the petrochemical

production and investment in chemical and food industries was right move. The sector 38, also, behaved as food industries and shows that the policies of the Ministry of Heavy Industries in early 1990's to support auto industries and other machinery productions has also proved to have positive outcomes, but the investments in Basic Metal Sector (37) has not proven very favorable, because the value added from 1991 onward has collapsed altogether and failed to reach its own record of 1991. This point is confirmed by Khiabani(2008).

The question 2 is: has fiscal repression been a favorable mechanism to increase Iran's industrial growth? Our model gives a positive answer to this question and explains that this is the most significant factor in industrial growth.

Yet the conclusions of this article could be extended to the historical framework and obtain an explanation of the question of why the industrial firms in Iran in 18th and 19th century were totally destroyed or an industrial basis did not form(note carefully that it is possible to generalize our finding in two directions). Indeed if it is possible to apply our finding to historical perspective, it can possible to provide an explanation of why manufacturing firms (or more correctly craftsmen and guilds) of Iran were destroyed in 19 century or industrial basis did not form. This is done when we think of two sources of industrial growth which we find in this article. In the 19 century, the industrial sector has not readily appropriable rent and wage goods for labor force to keep wages constant. When in 18th and 19th century Iran's valuable coins were going, rapidly, out of the country and inflation was also increasing, in particular with the commercialization of agriculture that would decrease the amount of food products available to the population (Katozian 1989), the industrial sector had been deprived of two major sources growth:
1- A repressed fiscal system that it could utilize the interest rate rent;
2- An appropriate agricultural system that could offer the subsistence goods to the working class in a proper price.

In fact the industries were deprived from two factors of growth: interest rate rent and exploitation of labor force. This, along with the open door policy of Qajar era contributed to total destruction of the industrial sector. Of course, we must not rely much on open door policy, because there are evidences of Japan economy that show the United States in 19th century prevented the application of custom tariffs on imported commodities by

Japan, and it took the country a long time to be able to regain its autonomy on setting tariffs. Thus, stronger causes should be drawn out of above arguments. The fact is Iran's economy had suffered, immensely, from extreme financial shortage in 19th century.

Here, once more, Marx could help to move this analysis forward. He observes that with emergence of modern manufacturers under modern managements, the traditional firms, with outdated managements, would not be able to compete, neither in terms of management nor of the working scales. Therefore, many native industries that were held by the guilds or the traditional craftsmen were unable to hold out and gave up. Competitions by modern manufacturers sheltered by open door policy were causes that helped in destruction of Iran's native industries. By all means more research in this issue is required.

7-conclusion

In this article we present a simple mathematical-theoretic model to derive the interest rate rent, labor exploitation and profit from the basic statistics which are available in statistical center of Iran on industrial firms. Indeed it is what we have in hand on industrial firms and this paper is an effort to extract most from little. Therefore it is a contribution to the theory and empirics of rent seeking and in general, political economy of Iranian economic development.

We show that the industries enjoy a favorable environment to extract rent from banking sector and this is the main source of accumulation of capital and growth. In the estimation model of value added on interest rate rent, exploitation and profit, we see that interest rate rent has the greatest impact on production, and labor exploitation and profit seeking has small effects on production.

We generalize this result to political economy setting and derive a hypothetical conclusion regarding historical development of industrial sector of Iran. It is said that in 18 and 19 centuries the modern industrial base was not form or the existing one is destroyed because this sector deprived from a formal monetary and banking system and due to commercialization of agriculture in these centuries deprived also from cheap wage goods for labor force. Further historical conclusion and hypothesis can proposed based on this results.

8- Hints for further research

The framework and discussions offered in this article could be developed to measure all sorts of 'rent seeking' and perform other research in this context. For instance to study the rent that has gone to the industrial owners because of setting two different rates for foreign currency; or the rent arisen from differences among imported intermediate commodities; or subsidies that have been paid to the industrial sector; or the support offered by the monetary system to the industrial sector. The same research could be repeated for other economic sectors. Each of these could be proposed as a Master degree thesis or a Doctorate dissertation and the authors of this article would be happy to offer their experiences, documents and data to the interested scholars.
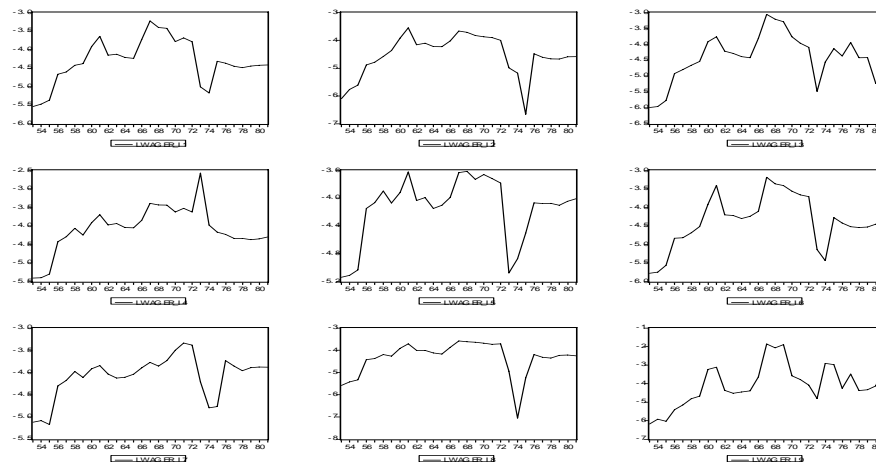
Annexes

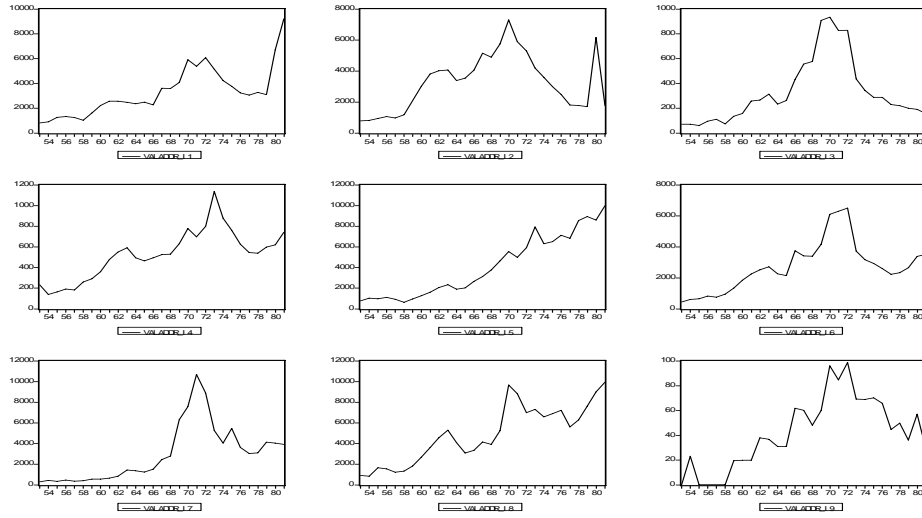**Figure A-1: The trends of real wage in Iran's industry**

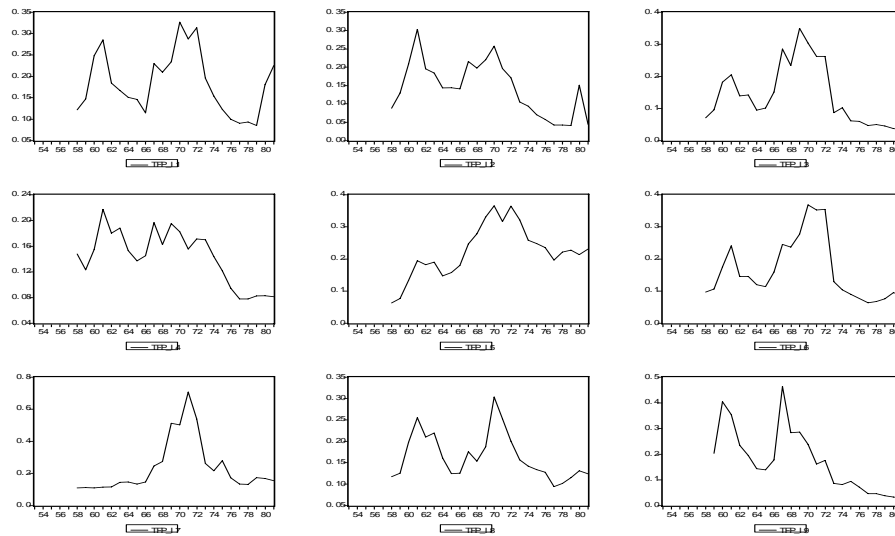**Figure A-2: The trend of value added in Iran's industry**

Figure A- 3: The TFP trend in Iran's industry

References:

1- Abrishami, Hamid, and Mohammad Hadian. (2004). 'Rent Seeking and Economic Growth (Empirical Evidences from Iran). Economic Researches no.67.

2- Culture and Reflection. (2004). 'Rent Structure and Corruption' Special Issue, Third year. No.11.

3- Katozian, Mohammad Ali (Homayoun). (1989). 'Political Economy of Iran'. Two Volumes. Trans: Nafisi, Mohammad Reza and Kambiz Azizi. Tehran: Papyrus Publications.

4- Khezry, Mohammad and Mohsen Renani. (2004). ' Rent Seeking and its Social Cost', Mofid letter, No.10.

5- Khiabani, Naser. (2008). 'Consequences of reforming trade policy in Iran after accession to WTO', Tehran, Institute for Trade Studies and Research.

6- Maidary, Ahmad. (1994) 'Information Asymmetry as a Sources of Rent ', Rahbord, No.4.

7- Moulai, Mohammad. (2004). 'A Study of Factors Affecting Profitability of Small Industries in Iran'. Trade Researches Quarterly. No.31. Summer 2004)

8- Nafar, Nosratollah. (2001). 'Estimation and Analysis of Production Function in Iran's Industry'. Modaresh Economic Researches. Year 1. No.1. Spring 2001.

9- Appelbaum, Elie and Eliakim Katz (1987) "Seeking Rents by Setting Rents: The political Economy of Rent Seeking", The Economic Journal, September.

a. Degryse, hans, Steven Ongena(2008), Competition and Regulation in the Banking Sector: A Review of the Empirical Evidence on the Sources of Bank Rents, *Handbook of Financial Intermediation and Banking*.

10-Delorme, Charles D., David R. Kamerschen and John M. Mbaku (1986) "Rent Seeking in the Cameron Economy: Kroeger's Analytic Thechnique Helps to Account for Development Lag in Colonial States", American Journal of Economics and Sociology, vol45. No.4.

11-Hillman, Arye and Eliakim Katz (1984) "Risk-Aversion Rent Seekers and the Social Cost of Monopoly Power", The Economic Journal, March.

12-Hornick, Mark F. Erik Marcadé, Sunil Venkayala(2007), Solving Problems in Industry, *Java Data Mining*.

13-Khan, Mushtaq and K.S. Jomo (2000) Rent, Rent Seeking and Economic Development, Theory and Evidence in Asia, Cambridge: Cambridge University Press.

14-Klaassen, Pieter Idzard van Eeghen(2009), Running the Numbers: Measuring Economic Capital, *Economic Capital*.

15-Krueger, Anne O. (1974), "The Political Economy of the rent Seeking Society", The American Economic Review, June.

16-Looney, Robert E. (1989) "The Economic Impact of Rent Seeking and Military Expenditures: A Comparison of Third World Military and Civilian Regimes", American Journal of Economics and Sociology, Vol. 48, No. 1.

17-Mullen(Thor) Timothy, Tom Parker, Ryan Russel, Kevin D. Mitnick (2004), The Story of Dex, *Stealing the Network: How to Own a Continent*.

18-Poitras Geoffrey(2002), Derivative Securities, *Risk Management, Speculation, and Derivative Securities*.