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The Impact of Economic Sanctions on Financial Ratios of Companies Listed in Tehran Stock Exchange

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Abstract: In this resarch, we examine the impact of economic sanctions on Tehran Stock Exchange. For this purpose, ten ratios including cash ratio, current ratio, quick ratio, equity ratio, debt ratio, asset turnover, receivables turnover, return on assets, return on equity and net profit margin ratio have been used. These ratios represent the financial condition and performance of the companies studied. In this study, 87 companies listed in stock exchange were studied for the years 2003-2014. For comparison of the ratios during four periods of the sanctions, SPSS Software has been used. These results reflect the influence of economic sanctions on financial ratios.

Key words: Economic sanctions, financial reporting, financial ratios, Tehran Stock Exchange, Iran

INTRODUCTION

In recent years, many discussions have been made about the impact of economic sanctions on economic space and conditions of Iran and also has been raised much attention by the people and the authorities; but unfortunately, a few research has been conducted in the context of sanctions and their impact on economy and capital market of Iran. The basic question here is that whether sanctions have significant impact on stock exchange and the companies or not.

The sanctions studied in macro economy are important because their impact and prediction of outcomes must be considered by researchers and scholars in the countries under sanction. In the literature, the efficiency of sanctions is a very important debate. That the United States is leading a diplomatic sanctions reactions and may be unilateral and multilateral. Many studies have been done to define economic sanctions interpretations. Economic sanction is a discriminatory restriction on trade and economic and financial relations with another country. The country sending sanction chooses which economic restrictions to impose on the country. Sanction is an economic weapon for battle in civilian camps and also a diplomacy process that works beyond dialogue. Economic sanctions is a diplomacy that enforce foreign governments through pressuring on macroeconomics to change their political diplomacy.

The term “economic sanction” means civilian measures adversely affect the transportation of goods, services or capital to a country and aimed at punishment or enforcement of a country to be adapted with political goals of the country imposing sanctions or expressing its dissatisfaction with actions and behaviors of the sanctioned country (Behrouzifar, 2004).

Sanctions are imposed to pressure on a common characteristic of all nations that is essential needs of citizens. The use of sanctions is an economic war in which commercial restrictions replace with military weapons. Economic sanctions create trade barriers that could be used as an instrument of foreign policy between absolute war and unrestricted trade. Sanctions are not a direct replacement for war but also a tool of diplomacy. But war is the end of diplomacy. Sanction is basically nothing more than a quota or limit on the amount of goods, services and finance between two countries (Spindler, 1995).

Theoretical framework and research literature: Karso knows international economic sanctions as one of common and repeated features among political interactions of nations and states that US has employed the most economic sanctions after the Second World War. He used gravity model approach to assess the negative impact of international economic sanctions on international trade that is studied in two parts. In the first model, he estimates the panel of bilateral trade attraction

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between US and 49 countries under sanction. The findings indicated that extensive and comprehensive sanctions have significant negative impact on bilateral trade while it is not the same with limited and moderate sanctions. In the second model, he assessed the impact of unilateral sanctions of the US on the volume of bilateral trade between 49 countries under sanction and the countries of Group 7. The results show that extensive unilateral sanctions have negative impact while limited and moderate sanctions have positive impact on bilateral trade between the countries under sanction and Group 7.

Hufbauer *et al*. (1990) investigated 110 cases of economic sanction since the First World War and divided each one into similar parts and then analyzed whether the sanctions were successful or not? The success of the sanctions is studied based on political and economic success; and economic success is also assessed based on the submission of target country to the demands of the country imposed sanctions. The economic success of sanctions is assessed based on the elimination of economic welfare and the shock of decreased GDP. When GNP decreases, economic pressure on the public increases and it will threaten the government and cause domestic problems. This book explores the impact and success of sanctions on Cuba, North Korea, Libya, Iraq and Chile.

Keno in the book “The Power of Nations” investigated the economic power and the use of national power in international politics. He determined that how relations of power and domination can be used in economic sanctions. Balodin in his study did not attempt to measure success and failure empirically. He explained that sanctions are a tool of political economy. In his study, he studied diplomacy for alternative ways of trade sanction. His case study was conducted on South Africa, Cuba and Rhodesia.

Schneider and Troger (2006) argue that scientific studies in recent years have discussed on the question of how war affects the economy. The authors have investigated the impact of war on three regions with global financial market (FTSE, DOW JONES and CAC) over the years 1990-2000. They consider a framework of rational expectations in commercial liberalism studying the relations between war and economic exchanges. They have shown that the struggle between Israel and Palestine as well as the first encounter of the US with Iraq and former Yugoslavia through time series analysis and daily information of stock exchange has negative impact on global and the West financial markets.

Dreger *et al*. (2016) argue that exchange rate fluctuations severely affected Russian economy due to the heavy reliance on foreign trade and investment. From January 2014, ruble lost 50% of its value against the US dollar. The decline in the exchange rate started since the beginning of the conflict between Russia and Ukraine and led to the West to boycott Russia. Given that Russia is highly dependent on natural resources, decline in oil prices begins from the summer of 2014. They stated that a large part of the devaluation of ruble could be related to the decline in oil prices. However, unforeseen sanctions are considered as a significant change for exchange rate fluctuations.

Neuenkirch and Neumeier (2015) studied the effect of economic sanctions imposed by the United Nations and the United States on the GDP growth in the target country. Their sample included 160 countries experienced 67 economic sanctions during 1976-2012. They found that the sanctions of the United Nations have statistically and economically significant impact on target countries. In general, economic sanctions imposed by the United Nations reduce the GDP of target country by >2%. For a 10 year period, these impacts will lead to the reduction of GDP by 25.5%. Comprehensive sanctions of the United Nations reduce GDP by >5%. The impact of the sanctions by the US is much fewer and imposition of sanctions by the US would reduce GDP growth by 0.75-1%. This reduction in growth for 7 year will reduce GDP by 13.6%.

Tuzova and Qayum (2016) stated that Russian Economy is very sensitive to exchange rate fluctuations. At the beginning of 2014, this country suffered from weak economic growth due to the crisis in Ukraine and sanctions by the West. Reduced oil prices puts Russian economy more than before. They studied the dynamic relationship between oil price shock, economic sanctions and pioneer macroeconomic indices and finally indicated that oil price has significant impact on Russian economy and the vision of Russian economy is very optimistic.

Behrouzifar (2004) considers economic sanctions as an instrument to achieve political goals and objectives and also investigates the impact of unilateral sanctions of the US on economy and trade of American and global markets. He also states that the restrictions imposed by the US are in contradiction with US policy to diversify and increase global oil supply. In addition to dissatisfying the alliances, it threatens energy supply and imposes much expenses to US economy by reducing export and losing profitable market as well as the possibility of investment in rich resources of Iran.

Mafi studied the US economic sanctions on Iran from the perspective of international law and argues that whether the sanctions on Iran are valid and legitimate from the perspective of international law or not. He states that US policy for economic sanctions is in contrary to the evolution of trade system in international realm; unilateral implementation of international laws by the United States is illegitimate.

Azizinejad and Morteza (2009) examined the effects of economic sanctions on Iran's foreign trade in the fields of energy, goods and banking services. They argue that energy has not been affected by the sanctions and still continues its growth. Since 2007, the price of capital goods, machineries and equipment from European suppliers has been increased by 7-8% due to the intensified sanctions. The sanctions has affected banking system within short-term intervals but Iranian banks has overcome these sanctions by planning and management and also do their commitments and prevent from damaging their international status.

Biniaz (2011) reviewed recent evolutions in the Middle East and economic sanctions against Iran. He puts recent evolutions in the Middle East beside recent evolutions in the international system and then divide the Middle East into three groups of oil importers, oil exporter in line with US policies and oil exporters not along with US policies. He states that recent evolutions in the region have not positive effect on Iran's economy, because the countries exporting oil in line with US. policies avoid approaching Iran in the present time; and the countries exporting oil not along with US. policies are in danger of soft and hard attacks so that they are not in a situation to help weakening economic sanctions against Iran. The oil importing countries face with budget deficient and economic disorder during the transition era and they will also tend to economic policies of the West during the stability era. He summarizes that recent evolutions could lead to the restriction of respiratory tract of Iranian economy in the region, especially in the Persian Gulf littoral states.

Dizaji (2014) in his study examines the dynamic relationship between revenues and expenditures of Iran's government as a developing oil-based economy. He states that the share of oil revenue shock in explaining the government's expenditures is greater than the share of oil price shocks. He indicated that there is a strong causal relationship between government's revenues and expenditures and then concluded that the sanctions imposed with the aim of restricting Iran's oil exports affect Iran through government's expenditures which is the driving engine of a developing economy.

Fadaei and Derakhshan (2015) studied the impact of sanctions on Iran's economic growth during the years 1978-2013 by reviewing the history of economic sanctions and also determining the importance of each sanction imposed against Iran. They divided the years based on the severity of sanctions into three sections: weak, medium and strong; from 1979-1994 were introduced as weak years, from 1995-2005 as medium years and from 2006-2013 as the years of severe sanctions. They indicated in their short-term results that weak sanctions had not significant impact on economic growth but medium and strong sanctions have had significant effect. The results of long-term relationships also indicated that weak and strong sanctions have not had significant effect on economic growth while medium sanctions have had significant effect.

The history of sanctions on Iran: The first experience of sanctions on Iran dates back to the era of Dr. Mossadegh who was following to nationalize Iran's oil industry. After the Islamic Revolution, Iran was sanctioned that here we will describe the history of sanctions in order.

Canceling the sale of hundreds of millions of dollars of military equipment: In 1980, the first sanction occurred in response to America's embassy hostage incident. By this sanction, military contracts signed at the time of the Second Pahlavi illegalized cancelling the sale of military equipment; 12 billions of dollars of Iran's assets in USA were captured; all commercial exchanges between Iran and USA were forbidden; and all diplomatic relations with Iran were cut. After the end of hostage, United States continued the sanctions.

Prohibiting the export of chemicals to Iran: In 1983, United States imposed the unilateral sanction on Iran. The sanction was continued until the imposed war of Iraq against Iran; in this regard, United States negotiated with 20 countries for not sending weapons to Iran by 1978, the sanction of chemicals was extended to 150 chemicals with military applications.

Banning the import of oil from Iran: In 1987, Congress passed a bill to ban oil imports from Iran under the pretext of fighting terrorism. US-President Ronald Reagan banned the entry of goods and services from Iran with his special order.

The end of war: After the end of war in 1991, the Heige Court obliged United States to pay the compensations of 278 millions of dollars to Iran for the pre-payments of military contracts cancelled; but United States didn't stop the sanctions and also started a new round of sanctions to realize its new international system in the Middle East and the policy of containment in 1993. After the beat of Iraq in US attacks to eject from Kuwait in 1991, the United States executed the law of non-proliferation of military equipment for Iran and Iraq in 1992 in order to balance the powers in the region and thereby increased the sanctions.

Prohibiting US companies from investing in Iranian oil and gas: The US companies were prohibited from investing in oil and gas sector. In the following year, Congress passed a Penal Code against Iran and Libya. And the law which was known as the D'Amato law was later extended by the next presidents.

11th September: After September 11, a new wave of sanctions began under the pretext of concern for government and public opinion toward the danger of international terrorism, proliferation of nuclear weapons and the performance of Iraqi and Iranian regimes rose to an unprecedented manner; and President of the United States-J. Bosch-passed a law that permits blocking the property and assets of natural and legal individuals supporting terrorism. Some banks, such as Sepah Bank and Melli Bank as well as military industry companies were sanctioned.

Blocking 41 natural and legal persons in 2008: Europe Union blocked the accounts of 40 natural and legal individuals who cooperate with Bank Melli. Japan and Europe Union restricted their lending to the Islamic Republic of Iran; in 2010, companies sold gasoline to Iran or contributed to upgrade refinery capacity of the Islamic Republic were sanctioned.

Nuclear issue and UN security council sanctions: Six resolutions have been issued against Iran. The first resolution was passed in 2006. According to this resolution, Iranian assets and institutions outside the country related to the Iranian nuclear program were blocked. It was expressed in the resolution that if Iran ignored the resolution within the prescribed period, then tougher sanctions will be applied. And so new sanctions were Imposed after the expiry of two months.

The sanction of Melli Bank and Saderat Bank as well as prohibition of education for the students: Europe, after the Security Council Resolution, imposed sanctions against Iran. In 2008, the British government seized the assets of Melli and Saderat Banks and also some universities in Europe prohibited to accept Iranian students. Europe Union sanctioned 180 business and personal companies on Iran's energy and transport sector.

The sanction on 4 Iranian industrial groups and some banks by America: In 1387, four important industrial groups of defense industries were sanctioned. In 2010, Pars Oil and Gas Company, Moallem Insurance, Ansar Bank, Tire Transport Kish Shipper, Cooperative Foundation of Sepah and Refah Bank were added to the sanctions list. In 2008, Russia joined the Security Council sanctions against Iran and the possibility of transmission and supply of any materials or equipment or nuclear technology from Russian territory to Iran was banned. Russia also didn't deliver S300 systems to Iran.

Banning the entry of drug and repeated sanction on oil: In 2012, Iranian oil sale was banned and then medicinal and vehicle sanctions were added too.

MATERIALS AND METHODS

Population, sample and data collection tools: The population of study consists of the companies listed in stock exchange during the years 2003-2014. The sample has been selected using systematic removal system and considering the following criteria:

- Have been listed in the Tehran Stock Exchange before 2003
- The financial year end is 29 March
- The financial information is available
- Not included in banks and financial institutions

Given the above conditions, total of 87 companies have been selected among all the companies listed in Tehran Stock Exchange during 2003-2014. In this study, financial information is obtained by reference to the stock exchange website and financial statements of the companies as well as Rahavard Novin Software. Excell and SPSS 20 were also used for data analysis.

Objectives and hypotheses: Economic sanctions affect macroeconomic variables and at the same time affect financial variables and ratios of commercial units in small-scale. So the question that arises is whether economic sanctions affect different ratios of Tehran Stock Exchange member companies or not? How is the impact of economic sanctions on different groups of ratios and how much is this? Based on previous studies, we expect economic sanctions to affect financial ratios of Tehran Stock Exchange member companies. Accordingly, research hypotheses are as follows:

- H_1: Economic sanctions have significant effect on cash ratios of Tehran Stock Exchange member companies
- H_2: Economic sanctions have significant effect on leverage ratios of Tehran Stock Exchange member companies
- H_3: Economic sanctions have significant effect on activity ratios of Tehran Stock Exchange member companies
- H_4: Economic sanctions have significant effect on profitability ratios of Tehran Stock Exchange member companies

One way to study companies is to examine their financial ratios. These ratios allow you to compare and examine the relationships between various components of the financial statements; so in this study we have selected ten ratios out of the four general categories of financial ratios, including cash ratios, activity ratios, leverage ratios and profitability ratios which can represent the firm's status. In the following, we explain and discuss about these ratios.

RESULTS AND DISCUSSION

Ratios measuring short-term financial ability or cash ratios: These ratios provide information about the company's liquidity situation. The main issue in this ratio is the company's ability to pay short-term debts. Therefore, these ratios are used in our analysis in order to evaluate the impact of economic sanctions on Tehran Stock Exchange member firm's ability to pay short-term debts. Current ratio, quick ratio and cash ratio are financial rations that we have used in our analyses.

Ratios measuring long-term financial ability or leverage ratios: this ratio evaluates the relationship between financial resourced used in commercial unit with respect to debt or equity. In fact, it determines the composition of them. These ratios measure the company's ability to pay long-term debts. We studied two of these ratios: debt ratio and equity ratio.

Asset management ratios or Activity ratios: Using these rations to evaluate the company's performance in implementing assets. These ratios show that how is the company's performance in the use of assets. The ratios selected from this group consisting of asset turnover and receivables turnover.

Profitability ratios: Ratios of this group somehow measure the company's performance in the use of assets and profitability of operations. The main part of these ratios is the last part of Profit and Loss Statement, i.e. the net profit. These ratios may be affected by economic sanctions. The rations studied from this group consisting of return on assets, return on equity and net profit margin ratio (Table 1).

Fadaei and Derakhshan (2015) have achieved seven types of sanctions against Iran by examining the definition, types and methods of sanctions theoretically as well as reviewing the historical background of economic sanctions. Then, they weighted and ranked each type (normalized to one). Types of sanctions in order of priority are: financial sanction, commercial banks and the central bank; sanctions by Europe Union and international organizations; commercial (import and export) and investment sanctions; oil sanctions; sanctions on knowledge and Technology; detention of properties and assets of Iranian individuals and organizations outside Iran. Sanction on trade exchange with Iranian people, organizations and institutions. According to the historical trend of economic sanctions, Iran each year has suffered a number of these types of sanctions. Regarding the weight (importance) of each of the above sanctions, the severity of sanctions per year (as the sum of importance of the sanctions in that year) has been obtained. Accordingly, we considered 4 phases for the sanctions from 2003-2014; the first phase includes the years 2003-2005, the second phase 2006 -2008, the third phase 2009-2011 and the fourth phase 2012-2014. Since our variable has more than one group, analysis of unilateral variance was used to compare the means (single-factor analysis of variance). It should be noted that before using analysis of variance, we must ensure

Table 1: The introduction of ratios used

Variables	Calculation method
Cash ratio	This ratio is obtained by dividing the total cash to current liabilities
Quick ratio	This ratio is obtained by dividing the sum of cash, receivable accounts and prepayments to the total of current liabilities
Current ratio	This ratio is obtained by dividing current assets to current liabilities
Equity ratio	This ratio is obtained by dividing the sum of assets divided to equities
Debt ratio	This ratio is obtained by dividing total of debts to total of assets
Asset turnover	This ratio is obtained by dividing the company's sales to the total assets
Receivables turnover	This ratio is obtained by dividing the company's sales to the total receivables
Gross profit margin	This ratio is obtained by dividing the net profit to the sales (This ratio is multiplied by 100)
Return on assets	This ratio is obtained by dividing the net profit to the assets (This ratio is multiplied by 100). ROA ROA
Return on equity	This ratio is obtained by dividing the net profit to the equity

Table 2: The results of data normality test

Variables	Sig. level	Results
Cash ratio	0.000	Data normality assumption is rejected
Quick ratio	0.000	Data normality assumption is rejected
Current Ratio	0.000	Data normality assumption is rejected
Equity ratio	0.004	Data normality assumption is rejected
Debt ratio	0.000	Data normality assumption is rejected
Asset turnover	0.000	Data normality assumption is rejected
Receivables turnover	0.000	Data normality assumption is rejected
Gross profit margin	0.000	Data normality assumption is rejected
Return on assets	0.000	Data normality assumption is rejected
Return on equity	0.000	Data normality assumption is rejected

Table 3: Descriptive statistics

Variables	Average	Mean	SD	Skewness	Tension
Cash ratio	0.160	0.70	0.74	0.542	873.94500
Quick ratio	0.820	0.70	0.67	4.682	32.40500
Current ratio	1.350	1.19	0.86	0.738	28.12400
Proprietary ratio	0.380	0.37	0.20	9.019	1.20700
Debt ratio	0.660	0.63	1.57	31.861	1031.76400
Asset turnover	0.810	0.72	0.55	4.066	31.71600
Receivables turnover	0.540	0.32	2.06	25.795	757.82000
Gross profit margin	0.220	0.17	0.34	4.008	41.38500
Return on assets	0.130	0.11	0.13	0.725	1.09900
Return on equity	0.170	0.30	0.30	-19.956	441.32100

Table 4: The results of the research hypotheses test

Variables	Sig. level	Test statistic	Results
Cash ratio	0.088	6.5540	Null hypothesis cannot be rejected
Quick ratio	0.030	14.109	Null hypothesis is rejected
Current ratio	0.000	23.922	Null hypothesis is rejected
Proprietary ratio	0.001	17.329	Null hypothesis is rejected
Debt ratio	0.000	17.908	Null hypothesis is rejected
Asset turnover	0.108	6.0680	Null hypothesis cannot be rejected
Receivables turnover	0.029	9.0240	Null hypothesis is rejected
Gross profit margin	0.000	21.655	Null hypothesis is rejected
Return on assets	0.000	35.543	Null hypothesis is rejected
Return on equity	0.000	58.633	Null hypothesis is rejected

normality of the data. Kolmogorov -Smirnov used for data normality test. The results of this test are summarized in Table 2.

According to Kolmogorov-Smirnov test results for all variables, null hypothesis on the normality of data is rejected. So we can say that none of the variables is normally distributed. This is why we use non-parametric test to study the ratios (Kruskal-Wallis test). Table 3 shows the characteristics of the ratios under study and Table 4 shows the results of the study.

Hypotheses test results: According to the results from analysis, we see that null hypothesis on the effect of economic sanctions on financial rations of the companies listed in Tehran Stock Exchange cannot be rejected in two cases of cash ratio and asset turnover ratio. The rest of null hypotheses were rejected. In this review, the null hypothesis is the equality of averages in the four categories of sanctions. Here, the null hypothesis is the equality of averages in different phases of sanctions; so only two of ten ratios, i.e., cash and receivables turnover ratios have not been affected by economic sanctions.

CONCLUSION

In recent years, a lot of discussion have been made about the impact of economic sanctions on economic space and conditions of Iran and their impact on capital markets and corporate's performance. The impacts of some sanctions on economic situation of Iran have been studied by various researchers. In this study, we investigated the effect of economic sanctions on the capital market by examining the variations in financial ratios in four phases based on the severity of sanctions. For this purpose, ten financial ratios which represent the company's financial condition and performance, have been chosen. The results indicated the effect of economic sanctions on 8 ratios out of 10. In the two cash and receivable turnover ratios, there was no evidence about the effect of economic sanctions on these ratios. However, the results were not surprising because the economic sanctions were taken all aspects of Iran's economy.

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