

# Main Characteristics of Bilateral Trade between Iran and South Korea: Focusing on Trade Diversification

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## I. Introduction

South Korea and Iran enjoy economic ties covering many sectors and activities. Iran is one of Korea's largest trade partners in the Middle East and its fourth-largest supplier of crude oil. In recent years, South Korea has imported 87 percent of its oil from the Middle East, and Iran has become one of its top suppliers.

Although bilateral trade between Iran and South Korea reached a maximum of more than US\$12 billion in 2017, the US' withdrawal from the Iran nuclear deal on May 2018 and its new plans for re-imposing sanctions on Iran may affect Iran-Korea bilateral trade. This demonstrates how earnings from Iran's trade relations are somehow fragile against sanctions, and due to this fact the expansion of non-oil exports on the basis of an export leap strategy can be considered as a major goal of Iran's development plans in trade and business. In this situation, it will be essential to identify

areas with good prospects to enhance exports and diversify trade between Iran and its trading partners like South Korea. South Korea should play a volunteering and constructive role in collaboration with Iran. The long-standing relations and existence of several bilateral economic and trade agreements between the two nations indeed require a careful and in-depth study of the economic and trade positions of both countries.

Both countries enjoy ample advantages and potential to expand their economic relations. Iran has special characteristics which distinguish this country from others in the Middle East, especially in the case of human capital. The Republic of Korea, on the other hand, with its great development in technological sectors and high level of expertise in high-tech industries, would help Iran's economy through a plan of cooperation to develop its economy. Meanwhile, the major share of Iran's exports to Korea is based on petroleum and there are only transactions in the major industries between the two countries, indicating that Iran-Korea bilateral trade is yet to be diversified. This means the trade relationship is fragile and diversification could play a key role in achieving sustainable economic relations between

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the two countries.

Hence, the objective of this paper is to review the economic relations of both countries in the past and present, and then to identify future prospect for Iran–Korea economic cooperation, focusing on the expansion of future trade relations.

To this end, aggregate specialization index ( $TDIV_{it}$ ) has been calculated to describe the trade diversification between the two countries. Based on an estimated coefficient of  $TDIV_{it}$ , export diversification between Iran and Korea does not indicate a high rate of export diversification for Iran. In addition, the empirical results found by this study have showed that lifting embargos did not affect export diversification directly, which could be due to an increase in oil exports from Iran to Korea. However, the technology gap is a main factor which has affected trade diversification negatively, indicating that both countries have been unable to diversify their mutual trade flows due to differences in technology. In fact, the difference in technology levels between the countries implies the existence of a gap between industries and sectors which generates imbalances in trade performance, limits trade of special goods and negatively impacts trade diversity.

The implication of this study is that lifting embargos is not as important as addressing the technology gap when it comes to diversifying Iran-Korea trade relations. A policy of deep cooperation in investment and technology transfer is recommended in this respect.

## II. An Overview of Historical Relations

Over decades, as explained previously, South

Korea has enjoyed strong trade relations with Iran, one of its largest trade partners in the Middle East and its fourth-largest supplier of crude oil. However, bilateral trade between Iran and South Korea has fluctuated during recent years due to periodical sanctions against Iran. Bilateral trade between the two countries stood at higher than US\$17,426.65 million in 2011, and then decreased to US\$14,800.95 million in 2012 (Table 2) due to international sanctions on Iran. Korean imports from Iran decreased in 2012 and Korean imports of Iranian crude oil fell from 10 percent in 2011 to five percent in 2013, after it stopped importing Iranian oil for two months in 2012 in accordance with U.S.-led sanctions.<sup>1</sup> After receiving a temporary waiver by the United States, South Korea continued to import Iranian oil, but at a lower rate than pre-sanction levels.

Iran's economy is important for South Korea because Iran has become an emerging market for Korean auto parts, telecommunications, electronics, and refined oil products. Steel products and car parts constituted nearly 27 percent of Korean exports to Iran in 2012, and Korean companies such as Hyundai, Samsung Electronics, Daewoo Shipbuilding, GS Engineering and Construction, Hanjin Group, and Daelim Group have conducted major construction and other investment projects in Iran (Levkowitz, 2012). South Korean firms participated in energy infrastructure construction projects in Iran, and their exports to Iran have been mainly of iron, steel, consumer electronics, and appliances (Katzman, 2018).

Table 1 shows trends of selected economic indicators for both Iran and Korea over the

<sup>1</sup> U.S. Energy Information Administration. 2018. Country Analysis Brief: South Korea Available at <https://www.eia.gov/beta/international/analysis.php?iso=KOR> (accessed September 17, 2018)

period of 2008-2017. In general, the South Korean economy has a better condition in terms of GDP (based on purchasing power parity measurement) as Korea's GDP was approximately four times higher than Iran in 2017. Iran is suffering from an inflation rate much higher than Korea and climbing over the

2-digit range. The Iranian economy also experienced a hyper-inflation during 2013-2014 due to its negative growth in 2012 (-5.6%), lack of investment and international sanctions imposed in recent years. Additionally, the table shows a historical trend of Iran's official exchange rate depreciation during 2008-2017.

**Table 1. Comparison of Economic Indicators between Iran and South Korea**

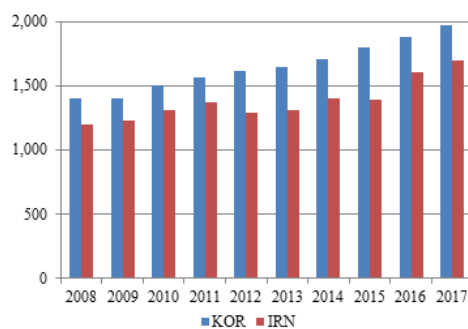
Year	GDP (Current Billion US\$)		GDP, PPP (Current International Billion \$)		Population (Million)		CPI (Annual %)		Trade (% of GDP)		Official Exchange Rate (Local Currency/ US\$)	
	KOR	IRN	KOR	IRN	KOR	IRN	KOR	IRN	KOR	IRN	KOR	IRN
2008	1,002	406	1406	1203	49	73	4.67	25.55	99.9	48.2	1102	9429
2009	902	414	1396	1224	49	74	2.76	13.50	90.4	43.7	1277	9864
2010	1,094	487	1505	1311	50	75	2.96	10.14	95.7	43.8	1156	10254
2011	1,202	584	1559	1373	50	75	4.00	20.63	110.0	43.2	1108	10616
2012	1,223	599	1611	1295	50	76	2.19	27.36	109.9	47.4	1126	12176
2013	1,306	467	1645	1313	50	77	1.31	39.27	102.8	50.3	1095	18414
2014	1,411	434	1704	1398	51	78	1.27	17.24	95.3	44.6	1053	25942
2015	1,383	386	1796	1394	51	79	0.71	13.71	83.7	39.0	1131	28805
2016	1,415	419	1877	1601	51	80	0.97	8.57	77.7	43.2	1160	32187
2017	1,531	440	1969	1700	51	81	-	-	80.8	46.1	1130	37197

Source: data.worldbank.org

Figures 1 and 2 compare changes in GDP in PPP (current international \$) and CPI (Consumer Price Indicator) for both countries in which Iran has experienced more fluctuations in these variables during the period 2004-2017.

**Figure 1. A Comparison of GDP, PPP<sup>1</sup>**

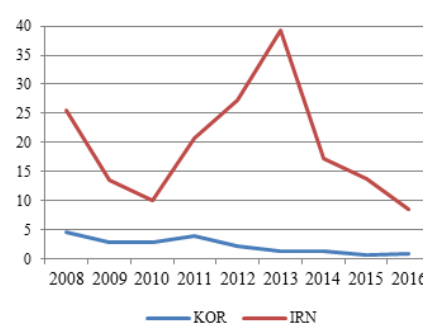
(Unit: Billion \$)



Source: data.worldbank.org, compiled by the author

**Figure 2. A Comparison of CPI Trends**

(Unit: Annual %)



<sup>1</sup> PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States.

Table 2 shows trends in the South Korea-Iran bilateral trade flows between the two partners during the period of 2008-2017. The table reports an increasing rate of trade relations except for year 2009, 2012, 2013, 2014 and 2015, indicating the effects of financial crisis and international sanctions imposed against Iran.

Meanwhile Iran-Korea bilateral trade showed an increasing trend during 2015-2017, due to a waiver of the international sanctions. Iran maintained a surplus in trade with Korea throughout 2008 to 2017 except for 2015, when an embargo was placed on Iranian oil exports.

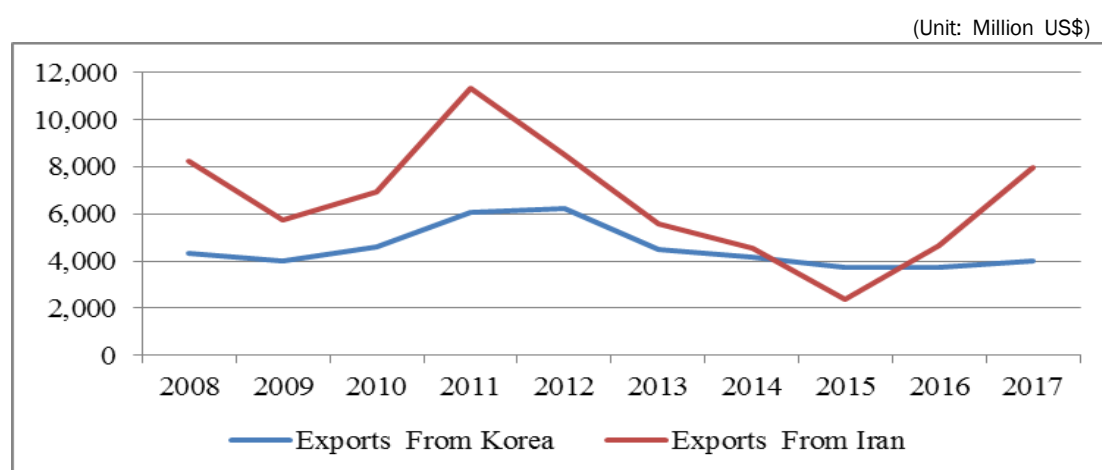
**Table 2. Trends of Iran-South Korea Bilateral Trade**

(Unit: Million US\$)

Year	Exports From Korea	Exports From Iran	Total Bilateral Trade	Growth Rate (%)
2008	4,342.56	8,223.06	12,565.61	29
2009	3,991.90	5,745.75	9,737.65	-23
2010	4,596.72	6,940.24	11,536.96	18
2011	6,068.28	11,358.38	17,426.65	51
2012	6,256.53	8,544.43	14,800.95	-15
2013	4,480.90	5,564.40	10,045.30	-32
2014	4,167.30	4,578.07	8,745.37	-13
2015	3,730.94	2,367.37	6,098.31	-30
2016	3,716.57	4,647.66	8,364.22	37
2017	4,021.06	7,989.30	12,010.36	44

Source: Unctadstat.unctad.org

**Figure 3. Trends of Iran and South Korea Trade**



Source: Unctadstat.unctad.org

Additionally, the data obtained from the UNCTAD (Unctadstat.unctad.org) shows the recent import/export values and the ranking orders of the 10 Iran's major trading partners in 2017 (Table 3). Out of the main partners' ranking, Korea is the third partner in exports to Iran and imports from its partner. The Unit-

ed Arab Emirates (UAE) is a significant trading partner for Iran and plays a dealer role between Iran and the other countries re-exporting between Iran and major partners, especially Iranian goods to be sent to the UAE for on-shipment to other countries.

**Table 3. Trade Values and Ranks of the 10 Iran's Major Trading Partners (2017)**

(Unit: Million US\$)

Rank	Country	Import Value	Rank	Country	Export Value
1	China	20,075.75	1	United Arab Emirates	32,619.27
2	India	10,342.67	2	China	18,493.10
3	South Korea	7,989.30	3	South Korea	4,021.06
4	Turkey	7,492.17	4	Germany	3,410.33
5	Italy	3,803.09	5	Turkey	3,260.00
6	Japan	3,581.19	6	Brazil	2,559.66
7	France	2,585.41	7	India	2,280.93
8	Afghanistan	1,490.47	8	Italy	1,952.63
9	United Arab Emirates	1,411.58	9	France	1,691.33
10	Netherlands	820.33	10	Netherlands	1,421.94

Source: Compiled from Unctadstat.unctad.org

### III. Conceptual Discussion and Methods

Traditional theories of international trade explain that countries gain in the international market by specializing in products which have comparative advantage. New theories focus on export diversification, which implies the access of new comparative advantages or broadening comparative advantages into new economic sectors. Hence, diversification is considered as a dynamic process in production.

There are, however, challenges on the concept of trade diversification, especially in terms of traditional or modern theories (Matthee and Naudé, 2007). In addition, export diversification is generally explained as the change in the composition of a country's existing export

product mix, export destination (Ali *et al.* 1991), or as the spread of production over many sectors (Berthelemy and Chauvin, 2000). It also means reduction in a country's dependence on an especial product or a very limited range of primary products generally exported before processing. However, export diversification can help countries to confront fluctuations in exports of some products and access to income stability (Love, 1983; 1979), or combat earnings uncertainty and changing market conditions (Labys and Lord, 1990).

To explore determinants of trade diversification between the two countries, we follow the relevant literature in which Dutt *et al.* (2008) and Parteka and Tambieri (2011) have investigated GDP (GDP per capita), R&D, technology and geographical distance as major and significant factors to explain changes in export

diversification.

To calculate the export diversification index, we apply the Aggregate Specialization Index  $TDIV_{ijt}$  as:

$$TDIV_{ijt} = \sum_{k=1}^N \left( \frac{X_{kijt}}{X_{ijt}} \right)^2 \quad (1)$$

Where,  $X_{kijt}$  is the export of product  $k$ , being exported from country  $i$  to country  $j$ , and  $N$  is the number of products measured and  $X_{kijt}$  is total export from country  $i$  to country  $j$ . The index  $TDIV$ , indicates values  $0 \leq TDIV \leq 1$  (Samen, 2010), in which a value closer to 1 represents a high concentration of exports (extreme low diversification) and a value close to 0 indicates a low concentration of exports (extreme high diversification). It is worth noting that  $TDIV$  shows exports concentration, so that a higher level of concentration indicates a lower level of diversification in exportable products (Lugeiyamuis, 2016).

To investigate the determinants of trade diversification, the augmented gravity model incorporates a number of determinants that are expected to affect export diversification flows between Iran and Korea – such as the exchange rate of both countries, GDP per capita, geographical distance, technology differences

between the two countries – and a dummy variable has been applied for lifting embargoes against Iran after Iran's nuclear talks with the 5+1 powers.<sup>1</sup> The results were estimated in four cases, of which two include the effect of post-sanctions and other two just focus on the effect of technology gaps in the absence of post-sanctions. The technology gap is proxied by absolute differences in Iran and Korea's economic patents and R&D projects.

## IV. Empirical Results

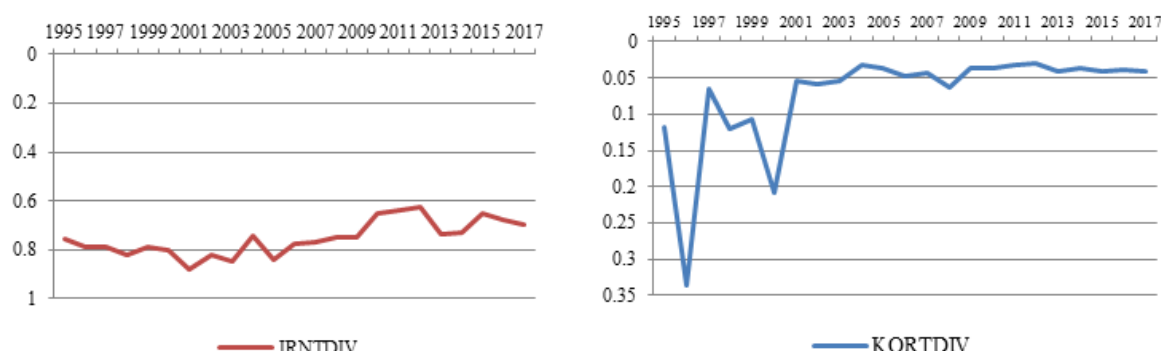
In order to calculate the flows of Iran-Korea bilateral export diversification between Iran and Korea, we compute the  $TDIV$  index by using data on bilateral trade at 8-digit classification from the Harmonized System (HS). We have extracted original data from Iran's Customs Administration (IRICA)<sup>2</sup> and UNCTAD. The trend of the calculated  $TDIV$  in Figure (4) indicates that Iran's export diversification remained lower than 1, at the Harmonized System (HS) 8-digit product aggregation level, throughout the period of 1991-2017. This result indicates that the level of diversification for Iran is not appropriate to go beyond the current situation.

<sup>1</sup> More details on the results are available upon request via email.

<sup>2</sup> The Islamic Republic of Iran. Customs Administration (IRICA). Available at [www.irica.gov.ir](http://www.irica.gov.ir) (accessed September 25, 2018).



Figure 4. Iran and Korea Bilateral Exports Diversification (2017)



Source: Author's computation

Totally, the diversification index for Korea is lower than Iran, which indicates that the variety of products it exports to Iran is much larger than that those it imports from Iran, and the low volume of non-oil exports to Korea from Iran. Since 2011, a decrease in product concentration (i.e. increased diversification) has been observed, retreating from the higher levels observed between 2011 and 2015, when the share of mineral fuels (mainly crude oil) in total exports was highest. The increase during 2015-2017 indicates that the level of diversification decreased due to the lifting of sanctions and increase in oil exports to Korea from Iran and concentration on oil exports to Korea.

Based on the empirical results, the cross section effect of GDP per capita and exchange rate in the exporting country have had a positive impact on diversification, while geographical distance and the technological gap dummy of post-sanction era affect diversification negatively. This indicates that after 2015 and the partial lifting of embargos against Iran, the two partners failed to follow a good bilateral trade model, or adopt a long-term strategy for their trade relations. Nevertheless, the value of products traded between the two countries in-

creased during 2015-2017, and in 2017 bilateral trade reached a total of \$6.33 billion, the highest level for the past 10 years. Diversification remains low in bilateral trade between the two countries, especially in exporting goods from Iran to Korea, which basically relies on oil and oil products. It can be concluded that the technology gap and differences in capabilities to acquire knowledge are the reasons behind this weak diversification in Iran-Korea bilateral trade.

## V. Conclusion and Policy Implications

Our empirical findings show that trade relations between Iran and Korea have fluctuated over the period examined in this study, especially during the period of sanctions imposed on Iran. Bilateral trade between the two partners has shown significant progress after lifting sanctions. The existing technology gap between the two economies has hindered them from realizing their potential for more economic relations. In addition, the re-imposing of sanctions against Iran will affect bilateral trade between the two countries, particularly

exports of Iranian petroleum, and its products, to Korea.

There are some SMEs in Iran and Korea with the potential to cooperate in different sectors and forge deep and sustainable economic relationship between the two countries. Developing a deep level of cooperation in the SMEs' activities, for instance by promoting the exchange of human resources and technological knowledge, should be an effective way to diversify trade relations between great nations. Since the decreasing technological gap between the two countries can promote trade diversification, the implication we can gain is that investment cooperation in technological equipment and related joint venture will play an important role in expanding trade diversification and economic relations between the two countries.

### 1. What to Expect in the Future

Iran is trying to expand its regional ties in trade and investment, especially in Asia. Meanwhile, South Korea is trying to reduce the level of its economic relations with Iran, due to the resumption of U.S. sanctions. While a temporary measure, this affects longstanding relations between both countries. It seems the two partners will need to make a basket of fruitful plans and strategies for their future relations.

Among the potential solutions, an economic action plan along the Silk Road could be suggested. In addition, it is possible for Korean SMEs which are not yet invested or necessarily interested in the U.S. market to invest in Iran or start a joint venture with Iranian SMEs, and therefore countries like Iran are relevant to their business model. Therefore, they will be potentially able to cooperate in different sectors and forge deep sustainable economic rela-

tions and diversify trade. Especially, knowledge-based and innovative SMEs are able to play a key role in decreasing the technology gap between the two countries and promote trade diversification by transferring technology. However, as human capital makes it easier for a country to absorb new products or ideas and lessen the technological gap, student and researcher exchange programs could be a channel for facilitating technology transfer and decreasing the technology gap in order to improve trade diversification. **KIEP**

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