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MODELLING AND ANALYZING THE EFFECT OF SANCTIONS AND EXCHANGE RATE CHANGES ON FOREIGN INVESTMENT AND IRAN'S OIL EXPORT WITH A DYNAMIC SYSTEM APPROACH

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ABSTRACT

Sanctions and exchange rate fluctuations wield substantial influence within national economies, particularly in countries like Iran, reliant on robust oil export platforms. Understanding the consequential impacts of these dynamics on foreign investment and oil exports is pivotal for devising appropriate economic and political strategies.
This study employs the dynamic system method and Vensim software to scrutinize the ramifications of international sanctions and exchange rate variations on Iran's foreign investment and oil exports. Leveraging dynamic system modeling enables a comprehensive exploration of intricate cause-and-effect relationships among diverse factors, allowing for in-depth analyses of their temporal dynamics.
Utilizing time-based data pertaining to sanctions and exchange rate fluctuations, our research constructs Vensim models to delineate the intricate relationships between sanctions, exchange rates, foreign investment, and Iran's oil exports. Subsequently, employing these models, we conduct dynamic analyses and diverse simulations, interpreting the outcomes.
The findings reveal profound effects on oil exports triggered by shifts in sanctions; stringent sanctions precipitate a drastic decline in exports, while their alleviation leads to marked increases. Furthermore, fluctuations in exchange rates significantly impact the influx of foreign direct investment (FDI) in Iran, highlighting the pivotal role of exchange rates in trade and FDI flows.

Keywords: *International sanctions, Exchange rate fluctuations, Foreign investment, Iran's oil exports, Geopolitical economy, System dynamics.*

1- Introduction

The impact of sanctions and exchange rate fluctuations in Iran extends far-reaching consequences across the nation's economy and the daily lives of its populace. These sanctions typically arise due to international concerns over Iran's nuclear program and its perceived violations of international obligations, often enacted with the endorsement of the United Nations Security Council.

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International sanctions encompass a range of restrictions, including limitations on exports and imports, prohibitions on specific banking and financial transactions, and constraints on accessing advanced technologies. The resulting ramifications encompass adverse effects on economic growth, foreign investment, trade activities, and employment opportunities within the country.

Notably, these sanctions invariably diminish Iran's primary revenue source: oil exports. As a critical driver of the nation's income, sanctions exert a considerable downward pressure on export earnings, significantly impacting the country's economic stability and financial prospects. The repercussions of these issues extend to impeding economic growth rates and limiting domestic production capacities, consequently contributing to a decline in employment rates and an upsurge in unemployment.

Beyond the sphere of sanctions, fluctuations in exchange rates wield a significant influence on the nation's economy. Periods of increased exchange rates render Iran's non-oil exports more competitive in the global market, offering foreign buyers cheaper access to Iranian goods and services. However, this rise in the exchange rate concurrently escalates the prices of domestic goods and services, ushering in inflationary effects.

Conversely, a decrease in the exchange rate presents domestic industries with enhanced competitiveness in foreign markets as Iranian goods and services become pricier for international buyers. Nonetheless, a reduced exchange rate amplifies the cost of importing goods and services, exerting adverse effects on domestic industries, particularly those reliant on imports.

The combined impact of sanctions and exchange rate fluctuations introduces market instability and unpredictability within the country. Such circumstances curtail foreign investments and destabilize the financial and economic markets, posing significant challenges to Iran's economic stability and growth prospects.

2- Statement of the problem

In recent years, Iran's economy has felt the profound impact of both sanctions and fluctuations in exchange rates. The nation has encountered international sanctions targeting crucial sectors like oil export, banking, and finance, which exert extensive effects on foreign investment and oil exports.

These sanctions directly contribute to a decline in foreign investment within Iran, typically accompanied by restrictions on accessing financial and technological resources. Consequently, potential foreign investors tend to avoid engaging with Iran across various economic sectors, notably impacting industries such as oil, energy, transportation, and industrial production.

In parallel, the country's exchange rate has faced significant fluctuations due to economic and political pressures. These currency fluctuations significantly influence Iran's oil exports, as alterations in currency prices directly impact oil export prices, thereby altering the supply and demand dynamics. Moreover, shifts in the exchange rate wield a notable influence on foreign investment across diverse economic sectors, as investment costs and returns fluctuate in response to exchange rate variations.

The utilization of dynamic system modeling to analyze the effects of these sanctions and exchange rate fluctuations can offer profound insights. Employing system modeling alongside

diverse simulations enables the examination of multifaceted outcomes, including impacts on financial flows, foreign investment levels, economic growth, and employment rates. Such analyses serve to identify strategic approaches for effectively managing the impacts of sanctions and exchange rate fluctuations. Additionally, exploring effects such as price changes, interest rates, foreign trade dynamics, and the competitiveness of domestic industries further enriches our understanding.

Governments typically respond to these challenges by implementing measures encompassing foreign exchange policies, price regulations, fostering domestic industry growth, incentivizing non-oil exports, strengthening international ties, and exploring new revenue sources.

In a broad context, both sanctions and exchange rate fluctuations exert a substantial impact on various facets of the economy and the daily lives of people. These effects manifest across diverse economic, social, and political dimensions.

A meticulous review and analysis of the influence wielded by sanctions and exchange rate fluctuations on foreign investment and Iran's oil exports can significantly aid in devising comprehensive and scientifically sound solutions. Such insights are crucial for effectively managing these developments and augmenting the country's competitiveness within the global market.

This research aims to unravel the intricate factors influencing foreign investment and Iran's oil exports while delving into the consequential effects of sanctions and exchange rate changes using a systems dynamics approach. Employing this method enables a comprehensive analysis of how sanctions and exchange rate fluctuations impact oil investment and export, facilitating the identification and analysis of indirect effects and multiple feedback loops within the system. Furthermore, through systems dynamics modeling, this research endeavors to forecast potential future scenarios and devise effective strategies to navigate challenges and capitalize on opportunities.

The findings of this research offer invaluable insights for industrialists, policymakers, and economic analysts, fostering a deeper comprehension of these factors' impacts on the country's economy and presenting pertinent solutions for optimal management of these transformative changes.

3- Theoretical framework and research background

3-1- Theoretical background

3-1-1-The relationship between international sanctions and oil exports

The embargo on Iran's oil industry originated when Britain responded to the nationalization of Iran's oil industry in 1951. Subsequently, in 2012, certain countries, primarily led by the United States, imposed a new oil embargo against Iran to curtail or restrict its nuclear program. The countries implementing these sanctions aimed to diminish Iran's oil revenues, pressuring it to engage with the international community and address concerns regarding its potential military nuclear program. These sanctions encompass direct measures like embargoing purchases with buyers and indirect actions such as imposing insurance embargoes on oil tankers through banking restrictions, with the objective of diverting oil buyers from Iran to alternative suppliers.

Broadly, sanctions targeting Iran's oil, gas, and petrochemical industries from the inception of the Islamic Revolution until recent years can be categorized into the following four segments:

A) Sanctions on investment in Iran's oil, gas, and petrochemical industries, inhibiting collaboration of oil companies with Iran and hindering investments in the country's oil industry projects. Factors like the longevity of wells and equipment deterioration have contributed to a gradual decline in Iran's oil production .

B) Sanctions on the purchase and sale of crude oil, gas condensate, petroleum products, and petrochemicals from Iran .

C) Sanctions on the export of equipment and technology to Iran for oil extraction and refining .

D) Sanctions on the export of refined products and gasoline to Iran.

3-1-2- The relationship between international sanctions and foreign investment in the oil industry

Sanctions often lead to a reduction in foreign investment within Iran, primarily due to diminished confidence among foreign investors in the Iranian market and apprehensions regarding access to foreign capital and technology.

Several factors contribute to eroding foreign investor confidence in the Iranian market, Some of these factors are listed in Table 1.

Table 1. Several factors contribute to eroding foreign investor confidence in the Iranian market

Contents	factors
1	**Sanctions and Political Tensions:** (International sanctions and political tensions can significantly undermine foreign investor confidence by imposing restrictions and complications in foreign trade and investment).
2	**Non-Compliance with Regulations:** (Failure to comply with investment and foreign trade regulations can erode confidence, encompassing issues such as contract non-performance, abrupt changes in laws, violation of intellectual property rights, and instances of corruption).
3	**Political and Economic Instability:** (Instability in both political and economic spheres can deter foreign investors. Political instability generates uncertainty about the country's future trajectory, while economic instability heightens financial risks and market unpredictability).
4	**Lack of Transparency:** (Inadequate transparency and limited information about market conditions and investment prospects hinder foreign investor confidence. Insufficient access to information and opaqueness in decision-making processes discourage potential investments).
5	**Political and Economic Risks:** (Risks associated with political changes, high inflation rates, exchange rate fluctuations, banking instability, and security risks pose significant concerns for foreign investors and may reduce their confidence in committing to the Iranian market).

3-1-3- The relationship between exchange rate fluctuations and oil exports

Foreign investment plays a pivotal role in the economic growth of countries amid the process of globalization. Recent studies underscore the significance of exchange rates as key determinants influencing trade flows and foreign direct investment. Notably, foreign investment stands as an optimal means to fund various projects. Beyond financial support, it fosters technological advancements, skill development, enhances management practices, bolsters domestic workforce quality, expands export markets, augments domestic production standards, propels economic growth, and elevates societal well-being, thereby steering nations toward an open economy.

In the context of Iran, where a substantial portion of revenue stems from oil exports, global oil prices serve as a primary source of real exchange rate instability. As the world oil prices surge, government income amplifies. Given Iran's largely state-owned economy, this income escalation prompts increased government investment in national infrastructure. Paradoxically, heightened government investment subsequently curtails the allure of foreign investments within the country, leading to a reduction in foreign investment inflows.

The correlation between currency fluctuations and oil exports can be articulated as follows:

1) Currency and Oil Export Relationship:

- When a country's currency depreciates relative to other currencies, the value of oil exports tends to increase. This rise can result in heightened revenue from oil sales for the country.
- Conversely, a strengthening domestic currency may lead to a decrease in the value of oil exports. The price of oil correlates with the currency value, and a robust currency might prompt a decline in demand in the global market.

2) Effects of Currency Fluctuations on Oil Exports:

- Increased Income: Currency fluctuations can potentially boost a country's income, enabling it to manage domestic expenses by elevating oil prices.
- Decreased Demand: Strong currencies may dampen the demand for oil exports, as higher oil prices become relatively expensive for purchasing countries with stronger currencies.

3) Other Factors:

- Dependency on Oil: Nations reliant on oil exports are particularly sensitive to currency fluctuations, significantly impacting their economies.
- Economic Policies: Domestic economic policies, governmental actions, and decisions made by central banks can also exert influence on the relationship between currency fluctuations and oil exports.

3-1-4- The effect of exchange rate changes on foreign investment

Exchange rate fluctuations exert a direct influence on foreign investment within Iran. An escalation in the exchange rate often correlates with increased costs for foreign investment, subsequently leading to a decline in foreign investment inflows. For instance, a rise in the exchange rate can elevate the prices of imported raw materials and equipment, imposing higher expenses on foreign investors.

The ramifications of exchange rate fluctuations on foreign investment can be delineated as follows:

1. Impact on price and costs.
2. Impact on income and profitability.
3. Impact on investment decisions.
4. Impact on risk and uncertainty.
5. Impact on economic growth and development.

3-2- Experimental background

In this section, we will examine the articles that have discussed the impact of sanctions and exchange rate fluctuations on foreign investment and Iran's oil exports.

Aghaei, M., & Rezagholizadeh, M. (2018). Impact of Economic and Commercial Sanctions on Iran's Trade Relations and their Major Trading Partners. This article examines economic and commercial factors on the value of currency in Iran using fuzzy. The results of this article show that severe economic sanctions have a positive and significant effect on the exchange rate in Iran.

Iranmanesh,Saeed et al. (2021). Using the fuzzy logic approach to extract the index of economic sanctions in the Islamic Republic of Iran. In this study, based on the fuzzy method, an attempt has been made to define a quantitative index for economic sanctions during the years 1979–2019, using the opinions of economics experts on sanctions. This quantitative index can be utilized as a useful time series. Researchers in the field of Iranian economics and the economics of sanctions can help to study the impact of this economic phenomenon on different sectors of the Iranian economy. The results of this study showed the index of sanctions during 2011 and 2012, in which the most sanctions were imposed against Iran. The index was extracted and it was shown that it had the highest value.

Nakhli, S. R & et al. (2021). wrote an article that the purpose of this article is to analyze the simultaneous effects of oil sanctions and financial sanctions on the macroeconomic variables of Iran in a small open economy in the framework of dynamic stochastic general equilibrium. The severity of oil sanctions causes a decrease in oil production due to a decrease in investment, technology and oil exports and a decrease in the ratio of the central bank's foreign exchange reserves to the monetary base, which leads to an increase in the exchange rate. In addition, oil embargoes due to the reduction of oil exports and the implementation of expansionary financial policy in the form of increasing current costs and maintaining construction costs to prevent the increase in recession, which causes budget deficits and then the issue of bonds more with The nominal interest rate becomes higher. On the other hand, financial sanctions increase transaction costs and marginal costs in commercial sectors, which leads to inflation and a decrease in non-oil exports and various types of imports. Due to inflation and uncertainty, the consumption of a household increases and the investment costs of a household decrease.

Farahnak, Fardin. (2022). Comparative analysis of oil-driven economic policies for Saudi Arabia and Iran; using the CGE model. stated that with its leading contribution to GNP, prior position in funding the public budget, and a prominent share in the national exports, the oil sector contemporarily plays a substantial role in Saudi and Iran's economies.

However, massive accumulated oil earnings, the lowest oil production costs, and a superior rank in the world's proven reserves, indicate the economic improvement potential. Accordingly, analyzing feasible improvement in these economies through amplifying the oil sector by

measures that take to (1) the public budget components, (2) the oil revenues quotas, and (3) the composition of national imports and exports via a General Equilibrium procedure is the main goal of this research.

Ojeyinka, T. A & Yinusa, D.O. (2023). In their study, they investigated the sources of external shocks as well as the mode of transmission of these shocks using weighted variables of five important trading partners of Nigeria. In their study, they used the new Keynesian dynamic stochastic general equilibrium model and in the period of 1981-2018 using the Bayesian estimation method for this work. The findings of this study show that the price of oil, foreign production and inflation have a positive effect on the gap between production and inflation, while the foreign interest rate does not have a significant effect; Finally, this study shows that terms of trade with foreign partners and exchange rate are the most important transmitters of external shocks.

4- Methodology

The methodology employed in this research involves the utilization of the system dynamics approach. This approach encompasses various concepts, including the method's inherent nature, the modeling process, feedback structures and system loops, existing variables, diagrams and modeling tools, as well as model validation tests, to comprehend the dynamics of the system.

The research relies on the system dynamics methodology to construct a simulation model that will analyze data and information, providing functional insights into the system's behavior. Vensim software serves as a tool to develop mathematical models and conduct computer simulations, as established by Sterman.(۲۰۰۰)

Through this methodological process, the objective is to scientifically document the effects of sanctions and exchange rate fluctuations on foreign investment and Iran's oil exports. This approach empowers decision-makers to adopt long-term perspectives, facilitating the formulation of enhanced strategies to address challenges and capitalize on opportunities.

5- Research Methodology

The dynamic system method enables an in-depth understanding of the intricate interplay between various factors influencing foreign investment and oil exports. This method involves modeling cause-and-effect relationships among different elements, allowing the analysis of dynamic behaviors and temporal changes.

Within this thesis, we leverage temporal data concerning sanctions and exchange rate variations to construct dynamic system models. These models aim to delineate the complex relationship dynamics among sanctions, exchange rate fluctuations, foreign investment, and Iran's oil exports. Subsequently, employing these models, we conduct dynamic analyses and diverse simulations, interpreting the outcomes to unravel the intricate connections between these variables.

5-1- Variables

- Types of variables and their display

The state-flow diagram consists of various elements that we will discuss below:

- Stock variable:

Stock variable, level, accumulation, inventory, storage or warehouse are variables that specify the stock of the system and create information based on which decisions and actions can be taken. These variables only change over time and its value at any time depends on the value of this variable and other variables at previous times.

These variables are represented by rectangles. The value of each state variable is equal to the accumulation of the inflow to it minus the outflow from it. In general, its mathematical concept is equal to:

$$\text{Stock}(t) = \int_0^t (\text{inflow}(t) - \text{outflow}(t)) + \text{Stock}(t_0)$$

- Flow changes:

These changes reflect the accumulation rate of the system and changes in accumulation changes over time. These changes are flows into or out of a change, and therefore, decisions made in the form of flows over time affect changes in our information from the system. Input streams are shown with an arrow pointing to the state change and output streams are shown with an arrow pointing out of the state.

$$\frac{d(\text{stock}(t))}{dt} = \text{inflow}(t) - \text{outflow}(t)$$

- Auxiliary variables:

There are variables whose use is optional and with their help the subtle and detailed structure of policies can be defined. By using these variables, the defining relations of a rate variable can be defined

It was shown completely and with details, so the auxiliary variables make the system dynamics model more complete and understandable.

Figure 1 shows an overview of a state-flow diagram. (Sterman, 2000)

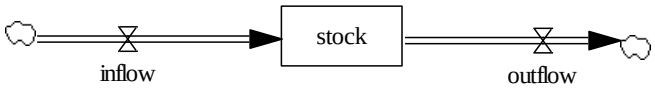

Figure 1. Overview of a state-flow diagram

6- Data analysis

6-1- A causal loop diagram

In system dynamics, graphical tools serve as essential aids to comprehend the intricate structure of systems. Causal-loop diagrams and stock-flow diagrams, as elucidated by Sterman (2000), stand as prominent graphical tools used to unravel system dynamics. Among these, causal-loop diagrams emerge as pivotal tools, illuminating the feedback structures inherent within systems. The process of delineating loops and establishing conceptual connections among variables stands as a pivotal stage in constructing dynamic system models. Building upon the earlier discussions,

this section aims to present the causal-loop diagrams depicting the intricacies of the oil export system, outlined in Figure 2.

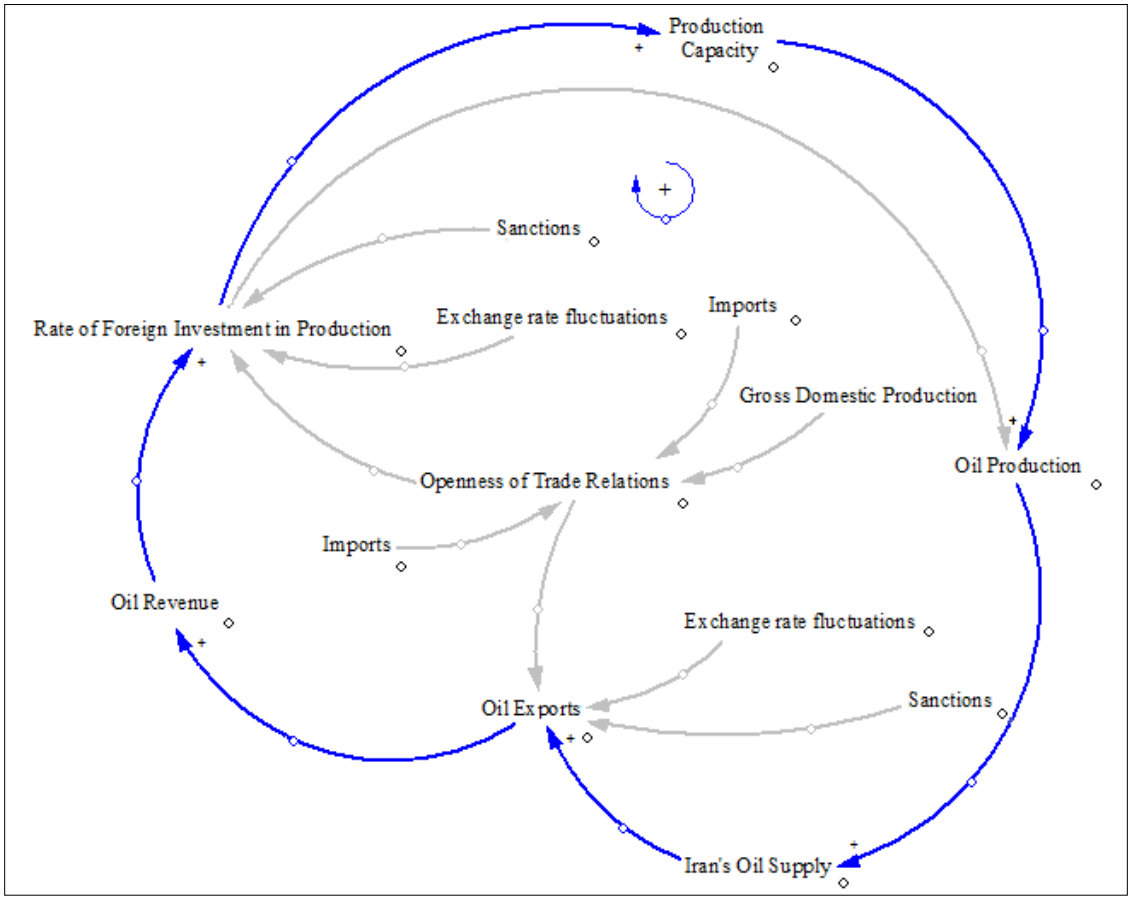

Figure 2. Cause and effect diagram of Iran's oil export

The exchange rate stands as a significant factor influencing the movement of capital in and out of a country. Fluctuations in exchange rates can directly impact the attractiveness of investing in Iran, affecting the cost of investments and the returns expected by foreign investors.
Moreover, the reduction of sanctions often leads to improved economic conditions and increased investor confidence, potentially fostering a more conducive environment for Foreign Direct Investment. This combined influence of exchange rate dynamics and the easing of sanctions shapes the landscape for FDI, making them critical considerations for both investors and policymakers in Iran.

6-2- Stock and Flow diagram

The previous section elucidated the cause-and-effect relationships, delving into the intricate reinforcing and balancing loops that underpin the system's behavior. Causal loop diagrams serve as highly effective tools, delineating interdependencies among variables and portraying feedback mechanisms integral to the system. They offer a mental model, enabling a deeper comprehension of the system's dynamics.

In this section, the focus shifts to the stock-and-flow diagram, a representation showcasing the system's current state. This diagram illustrates the system's status, often formulated using mathematical equations, thereby providing a visual depiction that forms the basis for decision-making. The stock-and-flow model encapsulated in this study is presented in Figure 3.

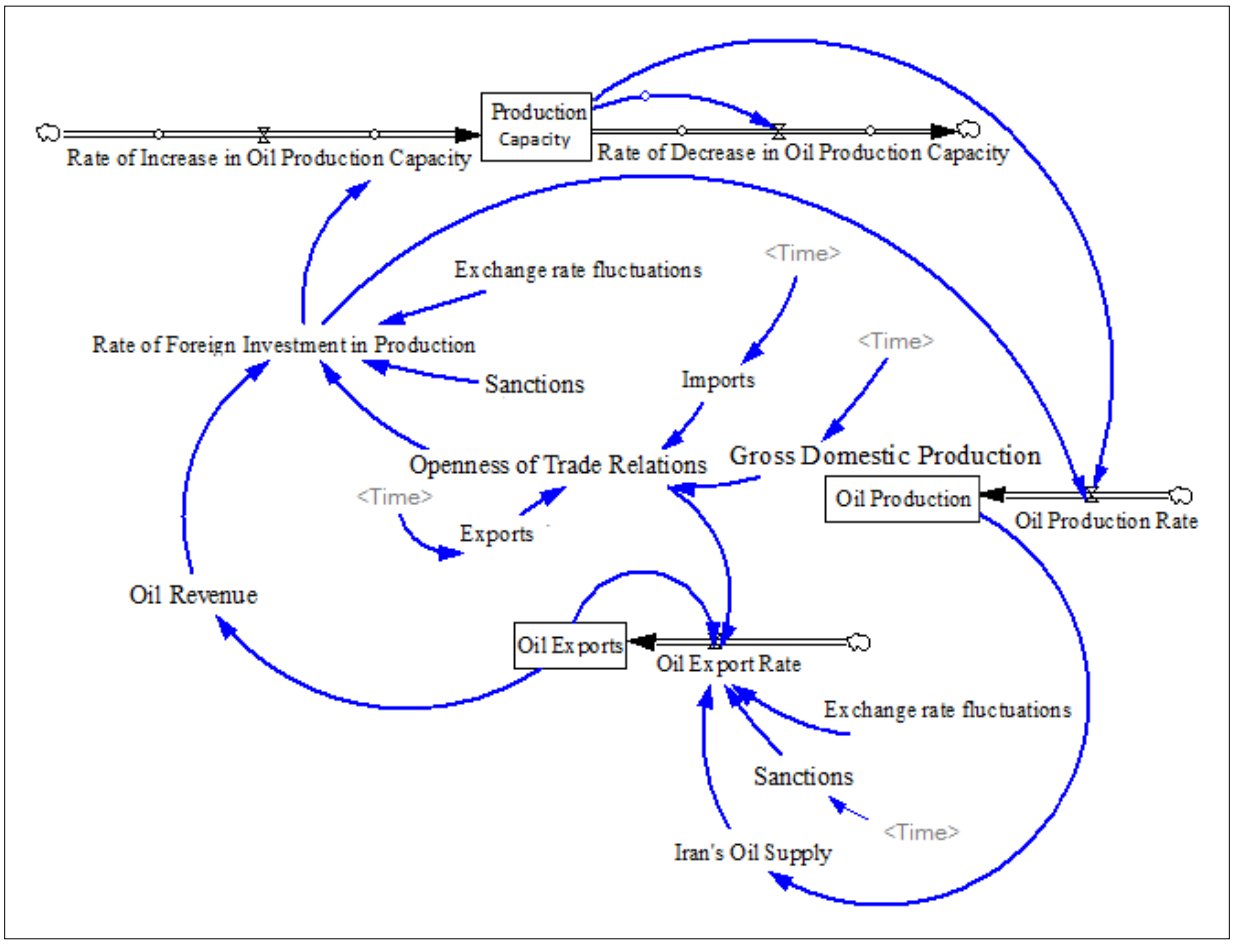

Figure 3. Status diagram - Iran's oil production flow and foreign investment in Iran's oil industry

Table 2, shows the types of variables used in this model.

Table 2. Variables used in the accumulation-flow model and its types

Variable type	Variable name	Row
Stock	Oil Exports	1
Stock	Oil Production	2
Stock	Production Capacity	3

Flow	Oil Export Rate	4
Flow	Oil Production Rate	5
Flow	Rate of Increase in Oil Production Capacity	6
Flow	Rate of Decrease in Oil Production Capacity	7
Auxiliary	Rate of Foreign Investment in Production	8
Auxiliary	Exchange Rate	9
Auxiliary	Sanctions	10
Auxiliary	Imports	11
Auxiliary	Exports	12
Auxiliary	Openness of Trade Relations	13
Auxiliary	Gross Domestic Production	14
Auxiliary	Oil Revenue	15
Auxiliary	Iran's Oil Supply	16

7- Validation of the model

7-1- Model test

Model testing is a crucial step in system dynamics modeling. Before utilizing the model for analysis, it is necessary to assess its validity through one or more methods .

7-1-1- Structure validation test

The structure validation test serves the purpose of aligning the model's structure with the pertinent descriptive knowledge of the system. It aims to ensure the logical consistency of decision rules governing variable behavior and validate the accuracy of the model's equation structure.

In this study, the equations pertaining to the model were formulated within the Vensim software environment. The utilization of this software confirmed the correctness of the model's equation structure, as depicted in Figure 4.

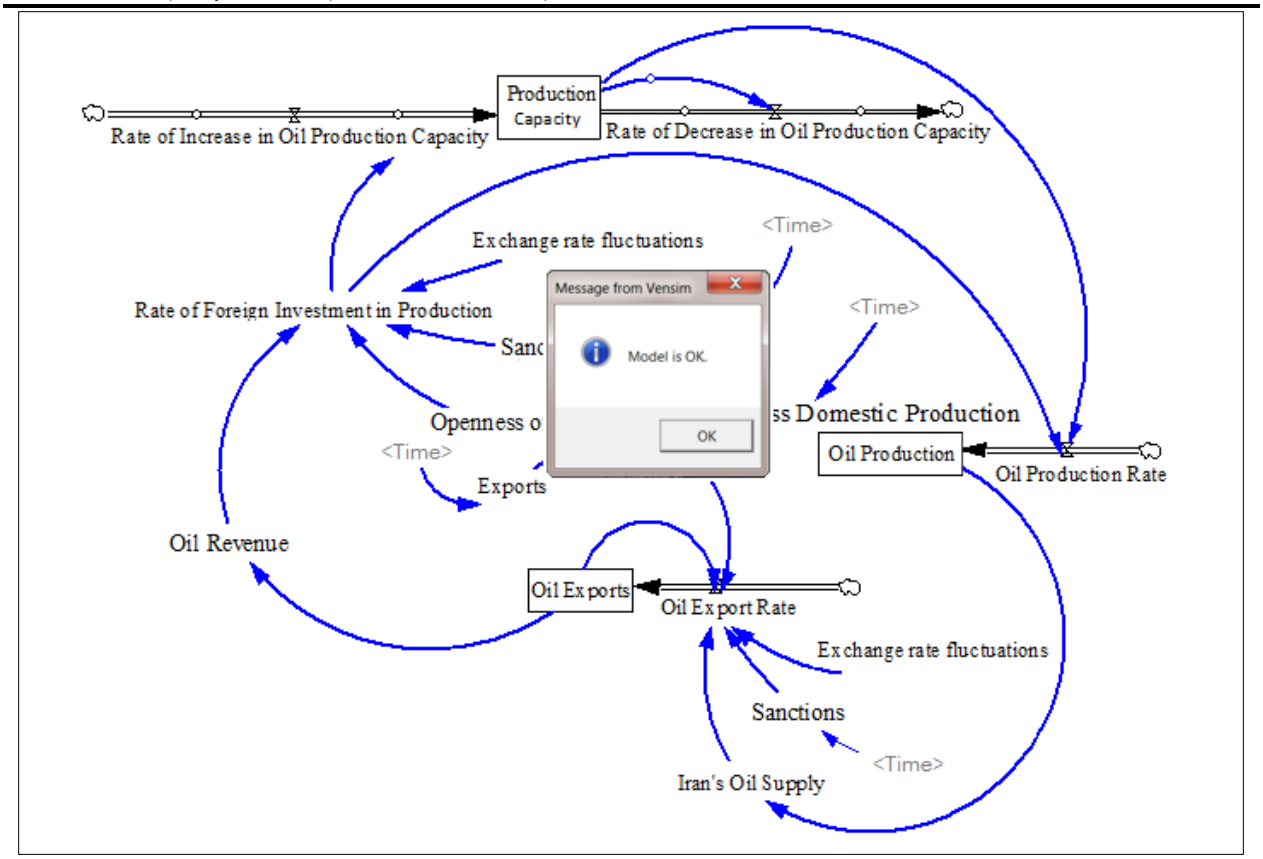

Figure 4: Model structure evaluation test

7-1-2- Repeat behavior test

This approach, known as behavioral replication, serves as a critical test in model assessment by aligning the model's outcomes with historical data. The comparison between the model's results and real historical data is instrumental in evaluating the model's accuracy. When the model closely replicates historical trends, it bolsters confidence in its reliability for assessments and future predictions.

Figure 5 illustrates this comparison, showcasing the simulated outputs of Iran's oil export system model (represented by the blue lines) alongside the actual values derived from historical data (indicated by the red lines). The close alignment between the simulated and actual data demonstrates the model's capability to mirror real-world trends, affirming its accuracy and utility for evaluation and predictive purposes.

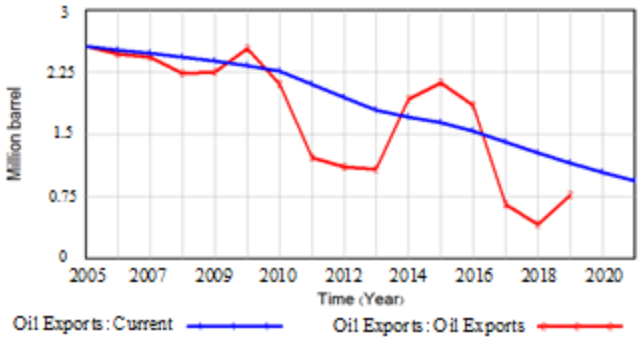

Figure 5. Retesting behavior: oil exports

8- Sensitivity analysis

After simulating and observing the behavior of all the components of the model in the desired period of time, changing the desired variables of the model and analyzing their effect on the main variables under investigation are done. Sensitivity analysis is mainly used to estimate some parameters in the model or to test some structures in the system when the parameters are not very accurate. The goal is to analyze the sensitivity of the model results by changing the parameters. (Zhang J, 2019).

Absolutely, the primary objective of this study remains consistent with the overarching goal of the research: to examine whether alterations in sanctions and exchange rate fluctuations yield significant changes in numerical values, behavioral patterns, and observed states of the principal variables under scrutiny.

Figure 6 depicts the sensitivity analysis conducted via 200 model runs, specifically investigating the impact of an embargo on Iran's oil exports, assuming a uniform random distribution. The outcome showcases the sensitivity analysis of the current scenario through a single blue line. The colored bars delineate the range where oil exports demonstrate sensitivity to the sanctions variable. This representation reveals that 100% of simulation runs fall within the gray bounded area, with 95%, 75%, and 50% of runs within the respective blue, green, and yellow bounded areas. These delineations highlight the extent of oil export sensitivity to variations in the sanctions variable across multiple simulation iterations.

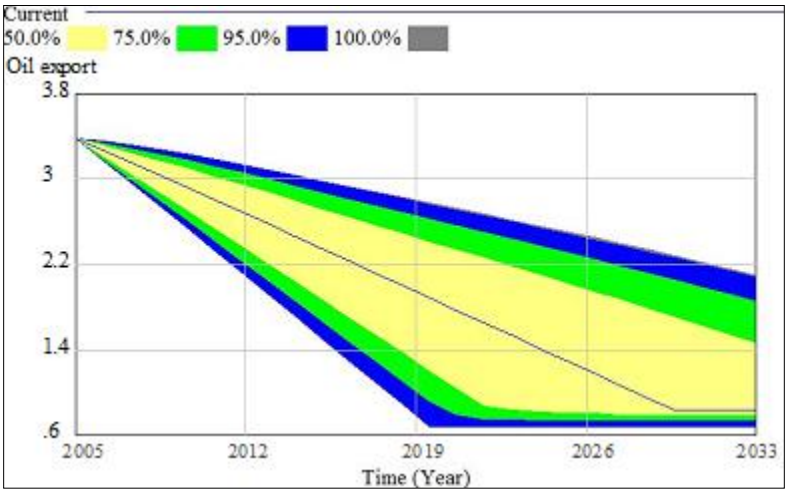

Figure 6. Sensitivity analysis results; The effect of international sanctions on oil exports

As shown in Figure 6, due to changes related to sanctions, oil exports are affected by many changes and these effects increase over time. If the sanctions are strict, oil exports will face a big drop (around 600,000 barrels per day), and if the sanctions are reduced, oil exports will face an increase of over 2 million barrels per day.

The effects of exchange rate on exports are shown in Figure 7. Although the effect of this shock is not as great as the sanctions, it still has a significant effect on oil exports.

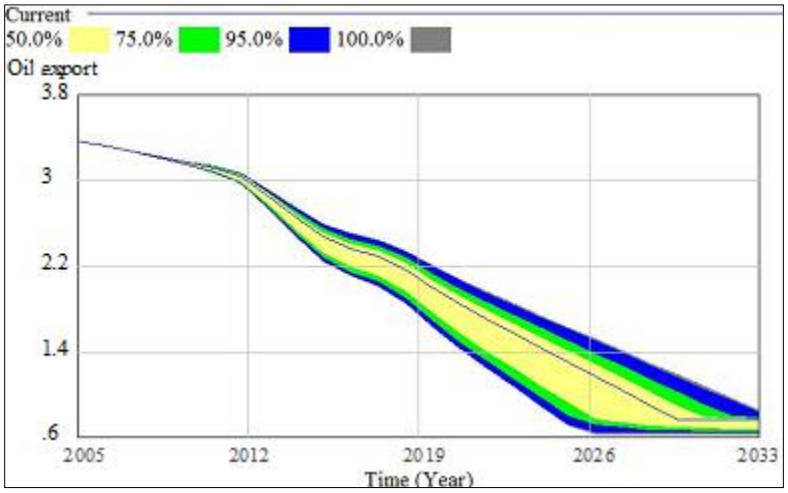

Figure 7. Sensitivity analysis results; The effect of exchange rate on oil exports

9- Conclusion and suggestions

9-1- Conclusion

the simulation outcomes yield several crucial observations:

1) Sanction-related changes significantly impact oil exports; stricter sanctions lead to a considerable drop, while reduced sanctions prompt a substantial increase in exports.
2) System dynamics, emphasizing feedback, delay, flow, and reservoir concepts, proves to be an invaluable tool for exploring complex systems, especially in the context of sanctions and Iran's oil industry. Decision-making benefits derived from this approach include:

    a. Enhanced understanding: System dynamics enables the identification of strengths, weaknesses, feedback loops, and delays within the intricate oil industry system.
    b. Long-term effect prediction: Simulation allows for forecasting the enduring impacts of decisions on national and international scales.
    c. Scenario exploration: Dynamic systems facilitate the evaluation of diverse scenarios, such as changes in sanctions, global oil price fluctuations, or shifts in foreign investments.
    d. Detection of unexpected reactions: This modeling aids in predicting and managing unexpected reactions within complex systems resulting from changes in individual factors.

e. Interrelation among decision-making levels: The model elucidates the interplay between national (e.g., oil policies) and international (e.g., sanctions) decisions.
f. Boosted decision-maker confidence: Understanding the system's mechanisms and effects enhances decision-makers' confidence in formulating effective and well-documented decisions.

Absolutely! In brief, the dynamic system serves as a critical tool for officials, aiding in comprehending the intricate variables and complexities influencing Iran's oil industry amid sanctions. It enables decision-making rooted in accurate information and a nuanced understanding of the system's dynamics.

9-2- Suggestions

9-2-1- Scientific-applied proposals

After analyzing the effects of international sanctions and exchange rate fluctuations on foreign direct investment (FDI) flow in Iran and the export of Iranian oil through the systems dynamics approach, the following suggestions can be considered for the next steps:

- Exchange rate fluctuations can have a significant impact on the flow of foreign direct investment (FDI) in Iran. Recent research shows that the exchange rate is considered as one of the main factors of the flows in trade and foreign direct investment.
- Implementation of appropriate foreign exchange policies: According to the research results, it is recommended that economic policy makers improve the conditions for attracting foreign direct investment and economic growth through the implementation of appropriate exchange policies, which lead to the stability of the exchange rate and reduce its fluctuations. help more
- Provision of appropriate foreign exchange policies: According to the research results, economic policymakers are advised to use appropriate foreign exchange policies, which lead to the stability of the exchange rate and reduce its fluctuations, to provide the conditions for attracting foreign direct investment and further economic growth.
- Provide policy recommendations: based on the research results, you can provide policy recommendations to improve foreign investment and export of Iranian oil in the face of international sanctions. These recommendations may include changes in economic and trade policies, strengthening international relations, adjustments to laws and regulations, development of new markets, and the use of fiscal and monetary policies.
- Examining side effects: Sanctions may have side and unexpected effects on the economy and societies. You can examine these side effects in your research and examine their effects on factors such as unemployment, inflation, changes in currency value, gross domestic product, and general economic health.
- Providing orientation solutions: In your research, you can examine orientation solutions to reduce dependence on oil exports and diversity in the economic structure of the country. These solutions may include the development of other economic sectors, the development of non-oil industries, increasing investment in innovative and technological sectors, strengthening the tourism industry and non-oil exports, and the development of knowledge-based foundations.

- Analysis of the impact of policy changes: If sanctions policies or domestic and foreign policies change, you can analyze how these changes affect. You can analyze the effects of policy changes on foreign investment and Iran's oil exports and provide solutions to manage these changes.
- Comparison with other countries: To improve understanding of the impact of sanctions on foreign investment and oil exports, you can consider other countries that have been subject to similar sanctions. By comparing the impact of sanctions on these countries and Iran, you can identify common patterns and trends and use their experiences to provide better recommendations and solutions for Iran.
- Communication with legal authorities and decision makers: the results of your research can be valuable for legal authorities and decision makers in the policy and economic field. You can play an active role in the decision-making process and policy implementation by presenting your results and recommendations to these people and institutions.

9-2-2- Scientific-research proposals

Our research serves as a foundational platform for further exploration into the implications of sanctions on Iran's economy and potential coping strategies. Future studies by students and researchers could delve into the following areas:

- The influence of sanctions on foreign direct investment.
- The effects of sanctions on non-oil trade dynamics.
- The ramifications of sanctions on the banking and financial sector.
- The impact of sanctions on technological development and innovation.
- The relationship between sanctions and Iran's international relations and diplomatic efforts.

These suggested areas of inquiry could significantly contribute to a more comprehensive understanding of the multifaceted effects of sanctions on Iran's economic landscape.

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11- Conflict of Interest: None

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13- Ethical statements: None

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