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Assessing the Volume of Money Laundering in Iran's Economy Using the Capital Flight Approach

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Abstract:

Money laundering refers to the concealment of the illegal origin of proceeds obtained from criminal activities, making it appear as if they stem from legal sources. This phenomenon has numerous negative impacts on various economic and social spheres; thus, the countries` authorities - alongside international bodies - have sought to combat it by enacting the necessary laws and regulations and enforcing them. This collaboration occurs to prevent the establishment of a free zone for money laundering and ensures that the efficiency of enforcing these regulations is not disrupted. Iran, due to being in the financial Action Task Force (FATF) blacklist, is considered a free zone from this perspective. This makes the research on evaluating money laundering methods applicable to this country and also makes selecting suitable methods significant and appealing. Therefore, this study utilized the findings of the study by Hendriyetty and Grewal (2017) and, considering the information limitations in Iran, employed a combination method using capital flight approach as an index for measuring money laundering. The results of the research indicate that over a 28-year period, from 1995 to 2022, approximately 553 billion dollars have been laundered in Iran, averaging about 20 billion dollars annually. The highest amount of money laundering in Iran occurred in 2011, during which nearly 55 billion dollars was laundered in the country. Additionally, the observations show the lowest amount of money laundering at around 4.8 billion dollars in 2001.

1- Introduction

Money laundering refers to any act or action taken to conceal or alter in which appearance of illicit proceeds derived from criminal activities in such a way that these proceeds be made to appear as though they have originated from legal sources. Criminals face the assumption that sooner or later they will confront

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justice and lose control over their assets. Therefore, their ultimate defense is to break the link between the criminal activity and the monetary flows that have led to legal actions in the legitimate economy (Fronza, 2016). In this context, criminals attempt to hide their criminal activities through money laundering in the financial system, international trade, or other efforts (Hendriyetty & Grewal, 2017).

Assessing the actual scale of money laundering in Iran or any other country, as well as globally, is extremely challenging, and measuring it as revenues derived from transnational crimes pumped through global financial systems is still in its infancy. Nevertheless, many different methods, although imperfect, have been proposed so far that provide various perspectives. Most studies conducted in Iran have utilized the method proposed by Bhattacharyya as articulated by Quirk (1996), in which the demand for cash is introduced as the indicator of dirty money, and the modeling methods have been limited. Bhattacharyya's method, according to Quirk himself, has not kept pace with advancements in financial markets and cannot estimate the volume of money laundering in sync with these developments. From a theorical perspective, domestic studies in Iran, regarding the classification of methods for assessing the volume of money laundering, lag behind foreign studies. In this regard, methods for evaluating money laundering in this country have been introduced through three approaches: direct, indirect, and modeling methods. This classification has been explicitly criticized by Unger (2009), who stated that money laundering refers to revenues arising from activities in the underground economy, parts of the shadow economy (such as tax evasion), and white-collar border crimes (such as capital flight and revenues from fraudulent invoices), which are not typically parts of shadow and underground economies. Therefore, methods such as case studies (direct methods), or models for measuring the shadow economy (modeling methods) tend to underestimate or overestimate money laundering.

Considering the shortcoming related to the methods for assessing the volume of money laundering in domestic studies, the present article aims to utilize the findings from the study by Hendriyetty and Grewal (2017), which sought to introduce the best approaches to money laundering in developing countries. Taking into account the informational limitations of Iran's economy, it will employ a combined method of capital flight approach to calculate the volume of money laundering. This method considers money laundering as the cause of monetary flows between countries and equates it with illegal flows arising from the balance of payment and trade invoicing leaks. Therefore, the following sections will outline the research background, introduce the capital flight approach in section three, and explain the rationale for choosing the combined method as the best method for assessing the volume of money laundering. Ultimately, in section four, illegal flows will be measured as an indicator of the

volume of money laundering, and the findings of money laundering, and the those of the research will be discussed together in section five.

2-Background research:

Most domestic studies conducted in Iran provide a theorical analysis of the effects of money laundering on Iran's economy and strongly recommend the adoption and enforcement of anti-money laundering laws. However, there are a few empirical studies that have evaluated the extent of money laundering in Iran's economy. These studies have been primarily limited to the Bhattacharyya methods and modelling methods. The former, due to its use of the demand for cash as an indicator of dirty money, fails to address the complexities of modern money laundering processes. The latter is associated with methods for measuring the shadow economy. Since money laundering encompasses a broader definition than the underground economy and shadow economy, including white-collar crimes, model-based methods tend to either underestimate or overestimate money laundering. Meanwhile, other various approaches and methods are used globally, which, despite their imperfection, have been able to address this complex process from their perspectives and reveal different aspects of it. These diverse methods range from direct method to capital flight approaches, economic approaches, the gravity model, and dynamic models. Numerous empirical studies have also been conducted to examine the effects of various macroeconomic variables, order and law, and other subjects on the extent of money laundering, as well as the impact of anti-money laundering laws on the economies of different countries. The following section references some of these domestic and international studies.

2-1-Studies in Iran:

Ardabili (2003), in his article titled "Money Laundering: Methods and Effects in Iran and the World," suggests that in order to effectively combat money laundering, the government should distribute all currencies approved by the parliament through the banking system, control all qharzol-hasne funds and other financial institutions as soon as possible by the Central Bank, reform the economic structure of the country effectively against money laundering, transform the banking system into a credit system, achieve an appropriate tax base, prioritize the fight against economic corruption, and eliminate sixty-two private ports that operate outside the oversight of customs and the Ministry of Economic Affairs and Finance.

Shiva and Mikaeili-Pour (2007) examined the issue of money laundering from the perspective of its negative effects on the economy, stating that money laundering undermines the activities of financial institutions, which are essential for economic growth, especially in developing countries, leading to a decrease in productivity in the real sector through inefficient resource allocation, encouraging criminal activities and administrative corruption, and ultimately

reducing economic growth. Additionally, money laundering can significantly impact the composition of a country's production system, thereby affecting the external sector of the economy (international trade and capital flows), and can dominate economic development in the long term.

Khajavi et al. (2010) used the money demand function, based on empirical works (Bhattacharyya method), to measure the extent of dirty money in the Iranian economy from 1973 to 2007. The results of this study indicated a significant positive relationship between the extent of dirty money, money demand, and the size of the underground economy.

Madah and Sinaian (2020) attempted to examine various dimensions of money laundering by evaluating its changes in the Iranian economy using structural equation modeling with a partial least squares approach (SEM-PLS) over the years 1981 to 2017. The results showed that theft and drug trafficking crimes have a significant positive effect on the trend of money laundering. Furthermore, economic conditions can motivate individuals to engage in illegal activities. Additionally, the growth of money laundering is associated with a decrease in gross domestic product and an increase in the volume of cash flow, which ultimately undermines economic stability. According to the findings of this research, money laundering in Iran is on the rise, and if crimes, particularly drug trafficking, continue to grow, this trend will persist, have negative impacts on the real economy.

2-2-Foreign Studies:

Walker (1999), estimated two different aspects of the money laundering process, which included scrutinizing the money produced for laundering in each country and estimating the flows of money generated from one country to another. He believed that money, once traveled, is washed and cleaned. Therefore, he followed a three-stage process. In the first stage, he distributed a questionnaire through AUSTRAC (Australian Transaction Reports and Analysis Centre) among police services and independent researchers, with the resulting figures considered as laundered money from each crime. In the next stage, the money generated from laundering in each country was estimated using crime statistics from the United Nations surveys on trends in crime or international victimization studies, and if data were unavailable, the average per capita crime rate for each of the 12 regions of the world would be utilized. The third stage was designed to understand the flow of money into and out of the country in question, namely Australia. Therefore, it initially aimed to identify where the majority of global money for laundering originates (20 countries were identified by Walker) and then introduced an attractiveness index based on the amount of illegal money entering this country from the 20 countries with the highest volume of money laundering.

Moreira and et.al (2012), analyzed a criminal model emphasizing the relationship between criminal activities and money laundering in a framework aimed at

optimal roles in suppressing and preventing crime, and concluded that anti-money laundering rules are effective only when repressive and deterrent actions against organized crimes are implemented.

Kar & LeBlanc (2014), presented a model of the drivers and dynamics of illegal financial flows to and from the Philippines from 1960 to 2011. These flows were calculated through leaks of the unregistered balance of payments and trade factors. The results indicated that nearly all the money that illegally enters and exits the Philippines have been so through fraudulent trade factors rather than through unregistered hot money flows such as wire transfers. Furthermore, the report conclusively shows that both illegal inflows and outflows are detrimental to the Philippines. Illegal outflows drain money from the internal economy of the Philippines, facilitate tax evasion and customs duty avoidance, and reduce domestic savings. Consequently, they conclude that illegal outflows disrupt sustainable economic growth in the long term due to the tendency to reduce or eliminate customs fees and tariffs resulting from under-invoiced imports; most illegal inflows stem from trade factors derived from under-invoiced imports. Additionally, the results of the research clearly indicate the correlation of all illegal financial flows with the World Bank's "control of corruption" governance index.

Maximilian & Teichmann (2017) identified twelve effective money laundering methods based on ten informal interviews with money launderers and their advisors, eighteen formal interviews with money laundering specialists, and a quantitative survey of 181 compliance officers. These twelve money laundering tools included gold, jewelry, rough diamonds, antiques, artworks, real estate projects, consultancy firms, mergers and ownerships, Dubai banks, deposit funds, private cash transactions, and exchange offices.

Eulaiwi and et.al (2024), explored the relationship between power in money laundering governance and the income change motivations, using a sample of multinational financial institutions in Australia. The results of this study indicate that anti-money laundering controls are an important governance mechanism to achieve fairness, equality, and transparency in the international capital and tax markets.

3-Assessment of Money Laundering Volume Using the Capital Flight Approach:

Measuring the extent of money laundering, from the lost money to the proceeds of laundering, is quite complex and requires conclusions drawn from a range of general perspectives consistent with the approaches used by criminals. Since the safer method for money launderers to conceal their criminal activities is to send money outside the jurisdiction, the flow of capital between countries in connection with money laundering can be mistakenly defined as capital flight.

The main difference between money laundering and capital flight, especially in policy and regulatory processes, lies in their motivations. Money laundering occurs because criminals send their money abroad to avoid detecting of its illegal source by judicial authorities, whereas capital flight takes place to avoid judicial actions aimed at controlling capital and foreign currency. Therefore, some methods of the capital flight approach may also include transactions with legal origins. Thus, those methods of the capital flight approach that only include illegal money flows can be utilized to measure the scale of money laundering.

In the theoretical literature on capital flight approaches, five methods are included: hot money, residual, Dooley, trade mis invoicing, and illegal financial or combination methods. Among these methods, the residual method and the Dooley method, which are conceptually and quantitatively too close together, have a strong connection with that concept of capital flight. Utilizing these methods to measure the volume of money laundering may not be without flaws, as they tend to overestimate illegal outflows due to unrecorded foreign debts of the government arising from legitimate fund sources. To support this, Claessens and Naude (1993) noted that the results of measuring capital flight using the residual approach and the Dooley method yield similar patterns, indicate that the Dooley method also includes capital outflow flows resulting from legal sources.

The hot money method analyzes issues related to the discrepancies between capital inflows and outflows in balance of payments by seeking errors and omissions, where the unexplained amounts arise from unrecorded capital movements, such as transactions with offshore centers, fictitious transactions, and under-invoicing. The greater the amount of these errors and omissions in the balance of payments accounts, the more likely it would be that the country has fallen victim to money laundering activities (Hendriyetty and Grewal, 2017).

The next method is trade mis invoicing, during which the reported export (import) values of the reporting country are compared with the import (export) values of its trading partners after adjusting from CIF (Cost, Insurance, and Freight) to FOB (Free on Board) prices, which is known as the mirror method. This price adjustment is made because, according to the IMTS 2010 methodology, exports are recorded as FOB and imports based on CIF. Imports include transportation and insurance costs up to the border of the importing country, while exports do not (Marini and et.al, 2018). In this method, traders tend to underprice exports and overreport imports to facilitate the outflow of illegal financial flows, while for the purpose of bringing illegal financial flows back into the country, they tend to overestimate exports and underestimate imports. This method appears to be the primary current method for smuggling money out of the country, as the misleading pricing model involves the physical movement of goods through the trade system, which is one of the three methods used by criminal organizations and terrorist financiers (FATA website).

The final method is the combination method or illegal financial method, which is a combination of the trade mis invoicing method and the residual or hot money one. According to the previously mentioned study by Claessens and Naude, the residual method tends to overestimate illegal outflows due to its consideration of unrecorded external government debts, which are considered as a legal source of funding, while the hot money method is limited in measuring balance of payments leaks, which are assumed to encompass illegal flows accurately. Therefore, to measure money laundering through illegal flows, the best and most comprehensive option is to assess the errors and leaks in the balance of payments using the hot money method and to measure the errors in trade invoicing.

3-1-Combination Method or Illegal Financial Method:

The combination method or illegal financial method for calculating illegal financial inflows and outflows as a measure of the volume of money laundering is an integration of the hot money method and the trade mis invoicing method. The amount of hot money in the balance of payments is observed as positive or negative numerical errors and omissions. A positive number indicates illegal financial inflows, while a negative number indicates illegal financial outflows. To estimate the values of leaks in trade invoicing, Iran's exports (imports) are compared with the imports (exports) of its trading partners after adjustment for the CIF/FOB ratio. After price adjustments, the bilateral trade values are used to determine four types of trade mis invoicing to highlight two channels for changing illegal financial flows, which will be explained further.

The method for calculating the value of trade mis invoicing can be expressed as follows:

$$Export\ misinvoicing: Mis\ X_{ij} = M_{ji} - X_{ij} \quad (1)$$

$$Import\ misinvoicing: Mis\ M_{ij} = M_{ij} - X_{ji} \quad (2)$$

Where $Mis\ X_{ij}$ and $Mis\ M_{ij}$ represent the mis invoiced exports and imports, respectively. X_{ij} and M_{ij} are the exports and imports of country i, and X_{ji} and M_{ji} are the exports and imports of country j.

The first channel involves underreporting the value of exports and imports, which necessitates the concealment of goods during transactions between country i (i.e., Iran) and each of its trading partners j.

$$Export\ under-invoicing\left(Mis\ Xu_{ij}\right) \rightarrow M_{ji} > X_{ij} \Longrightarrow MisX_{ij} > 0 \quad (3)$$

$$Import\ under-invoicing\ \left(Mis\ Mu_{ij}\right) \rightarrow M_{ij} < X_{ij} \Longrightarrow Mis\ M_{ij} < 0$$

The second channel involves overreporting the value of exports and imports or the movement of phantom goods between Iran and each of its trading partners.

$$Export\ over-invoicing\left(Mis\ Xo_{ij}\right) \rightarrow M_{ji} < X_{ij} \Longrightarrow MisX_{ij} < 0 \quad (4)$$

$$Import\ over-invoicing\ \left(Mis\ Mu_{ij}\right) \rightarrow M_{ij} > X_{ij} \Longrightarrow Mis\ M_{ij} > 0$$

Considering the four types of trade mis invoicing (over-invoiced exports and imports, and under-invoiced exports and imports), two types of illegal financial

flows can be identified based on the nature of the flow: one involves the physical movement of concealed goods (the first channel), and the other involves the non-physical movement of goods, or phantom goods (the second channel), which implies money flows.

The first channel is driven by the physical movements of goods that are concealed during the transaction process. This refers to under-invoiced exports and imports, which indirectly facilitate the inflow and outflow of the illegal flows as they involve t buying and selling goods. Under-invoiced exports mean receiving less money (outflow of money) because the trader in the partner country intends to deposit the remaining funds in a bank account abroad after selling the goods. Under-invoiced imports relate to receiving larger funds (inflow of money) but involve selling goods in the country of origin (Carton et al., 2018).

Exporters or importers with over-invoiced exports and imports report the values of physical and non-physical goods. In doing so, this practice becomes associated with the exchange of phantom goods along with similar direct money flows. In the case of over-invoiced export invoices, the exporter receives more money than what they would obtain by declaring the actual value of exports. Regarding over-invoiced imports, the importer benefits from cash flow according to actual goods transactions. The second channel allows for the creation of both internal and external illegal flows in a relatively direct manner (Carton et al., 2018).

Ultimately, the result of the combined method is that illegal outflows are subject to under-invoiced exports and over-invoiced imports, along with negative statistical errors in the balance of payments considered as hot money, while illegal inflows also include over-invoiced exports and under-invoiced imports along with positive statistical errors in the balance of payments. The total of illegal financial outflows and inflows is considered as an indicator of money laundering, defined as follows:

$$outflow\ IFF = MisXu_{ij} + MisMo_{ij} + negative\ estimates\ HMN \quad (5)$$

Where $outflow\ IFF$ represents illegal financial outflows, $MisXu_{ij}$ indicates under-invoiced exports, $MisMo_{ij}$ indicates over-invoiced imports, and HMN denotes hot money.

$$inflow\ IFF = MisXo_{ij} + MisMu_{ij} + positive\ estimates\ HMN \quad (6)$$

$inflow\ IFF$ indicates illegal financial inflows, $MisXo_{ij}$ refers to over-invoiced exports, $MisMu_{ij}$ refers to under-invoiced imports, and HMN is hot money.

$$ML = outflow\ IFF + inflow\ IFF \quad (7)$$

Where ML denotes the volume of money laundering.

4-Assessment of Money Laundering Volume in the Iranian Economy:

This section aims to calculate the volume of money laundering in the Iranian economy over a 28-year period, from 1995 to 2022. For this purpose, the combination or illicit financial method has been utilized. This method considers

money laundering as the cause of money flows between countries and equates it with illicit flows derived from balance of payments leaks and trade mis invoicing. To estimate leaks in the balance of payments, statistical errors from the World Bank's international debt statistics from 1995 to 2000 have been used, while the remaining data has been sourced from the balance of payments statistics of the Central Bank of Iran, which is observable as positive or negative figures.

To estimate the values of leaks in trade invoicing, Iran's exports (imports) are compared with the imports (exports) of its trading partners, obtained from the IMF's DOTs database, after adjusting for the CIF/FOB ratio. According to DOTs information, Iran is linked to 190 countries as its export destinations and to 176 countries as its sources of imports. For converting imports to FOB prices until 2016, the OECD (ITIC) transportation cost database suggested a fixed rate of 6%, whereby the value of imports was divided by 1.06. However, ITIC now utilizes varying CIF/FOB margins for each country instead of a fixed 6%. While this data is not specifically available for Iran, the ITIC database provides average global figures for each year from 1995 to 2022, which have been utilized in this study. After price adjustments, bilateral trade values are used to determine four types of trade mis invoicing (under-invoiced exports and imports, and over-invoiced exports and imports) to highlight two channels for illegal cash flow and complete them with hot money statistics. Ultimately, money laundering is expressed as the total of illicit inflows and outflows as a percentage of GDP. The results obtained from these calculations are presented in Table 4-1 (values are expressed in millions of dollars).

Table 4-1--illicit inflows and outflows and volume of money laundering in Iran, 1995-2022.

	Inflow			outflow			ML	(ML/GDP) *100
	HMN	Trade mis invoicing	IFF	HMN	Trade mis invoicing	IFF		
1995	284	3515.164	3799.16	0	10105.56	6986.6	10785.76	11.19%
1996	2622	3898.042	6520.04	0	5728.82	8051.40	14571.44	12.10%
1997	0	5997.792	5997.80	1096	6986.59	7684.63	13682.42	12.01%
1998	0	2825.62	2825.62	2198	8051.40	6524.69	9350.31	8.48%
1999	1184	5449.358	6633.36	0	6588.63	6317.75	12951.11	11.38%
2000	0	2129.49	2129.49	1355	4326.69	3014.77	5144.26	4.69%
2001	0	2777.19	2777.19	257.18	6317.75	2001.63	4778.82	3.77%
2002	0	3995.41	3995.41	159.17	1659.77	3911.71	7907.12	6.15%
2003	67.88	6193.79	6261.67	0	1744.45	1418.05	7679.71	5%
2004	680.67	7288.57	7969.25	0	3752.54	2024.57	9993.81	5.26%
2005	0	6939.12	6939.12	661.04	1418.05	2445.81	9384.93	4.14%
2006	0	11045.57	11045.57	2890.05	2024.57	6103.12	17148.7	6.44%
2007	0	19326.4	19326.4	3742.96	1784.77	8245.07	27571.47	7.88%
2008	0	20119.69	20119.69	3702.11	3213.07	7395.26	27514.94	6.67%
2009	0	17408.4	17408.4	3016.21	4502.11	7389.01	24797.41	5.96%
2010	0	20941.67	20941.67	5172.94	3693.14	11681.58	32623.26	6.70%
2011	0	11262.55	11262.55	23835.2	4372.79	43219.44	54481.98	8.70%

2012	0	9566.69	9566.69	4216.59	6508.64	18559.14	28125.83	4.37%
2013	0	16845.56	16845.56	2262.30	19384.19	7265.94	24111.5	4.89%
2014	0	21914.18	21914.18	5436.04	14342.55	10234.96	32149.14	6.98%
2015	0	17114.23	17114.23	1350.06	5003.66	4613.04	21727.27	5.32%
2016	0	15099.56	15099.56	8564.01	4798.92	1139.65	26494.21	5.79%
2017	0	16788.16	16788.16	3612.69	3262.98	8497.26	25285.42	5.20%
2018	0	16094.04	16094.04	6426.57	2830.63	10789.27	26883.31	8.15%
2019	2688.7	5014.12	7702.84	0	4884.572	8499.39	16202.22	5.71%
2020	4385.1	3044.41	7429.51	0	4362.704	7592.06	15021.58	6.27%
2021	0	6251.52	6251.52	914.95	8499.385	13219.79	19471.3	5.42%
2022	4897	7133.17	12030.17	0	7592.064	15045.86	27076.03	6.55%
Cumulative	16809.38	285979.5	302788.8	80869.11	169257.3	250126.4	552915.3	
Average	600.33	10213.55	10813.89	2888.18	6044.90	8933.087	19746.97	6.83%

Source: Research calculations

According to the results from Table 4-1, which assesses the volume of money laundering using the combination method of capital flight approach, approximately $553 billion has been laundered in Iran over the 28 years under review, yielding an average annual figure of about $20 billion. Notably, mis invoicing plays a significant role in this amount, stemming from discrepancies between trade statistics provided by Iran and those reported by its trading partners. The results also indicate that the highest level of money laundering in Iran occurred in 2011, with nearly $55 billion laundered that year, which is more than twice as much as the average annual money laundering figure and represents one-tenth of the total money laundered over the 28-year period examined in the country. Additionally, the observations reveal the lowest level of money laundering at approximately $4.8 billion in 2001 (see Figure 4-1).

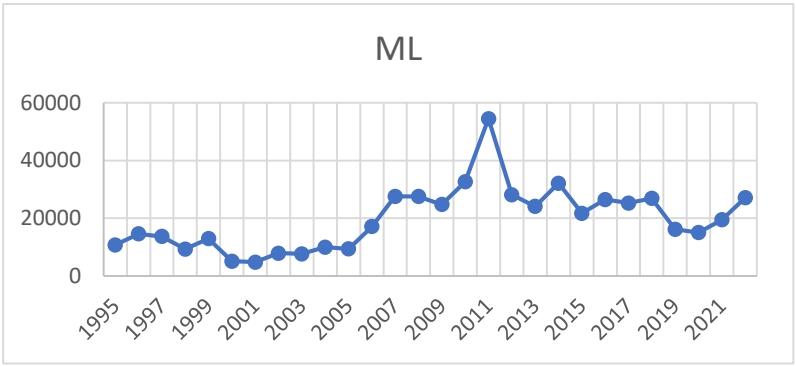


Figure 4-1- volume of money laundering in Iran during the period of 1995-2022

As stated in Table 4-1, it is customary to report these figures as a percentage of GDP for a better understanding of the magnitude of the amounts obtained for the volume of money laundering. The results of this measurement indicate that, during the 28-year period examined, launderers in Iran laundered, on average annually, about 6.83% of the country's GDP value. Among these, the lowest level of money laundering corresponds to 2001, showing approximately 3.77% of GDP, while the highest measured levels were in 1996 and 1997, around 12% of Iran's GDP (see Figure 4-2).

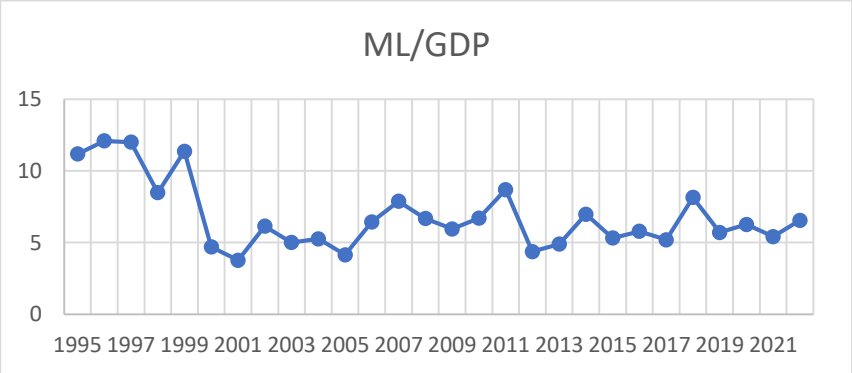


figure 4-2-the ratio of money laundering volume to GDP during the period of 1995-2022

5-Conclusion and Discussion:

Money laundering is a process in which illegal or "dirty" money, generated from criminal activities such as drug trafficking, arms smuggling, human trafficking, bribery, extortion, fraud, and others, is washed through a series of financial transactions and activities to appear as the legal money. Money laundering has numerous negative effects and repercussions across various economic and social spheres; these include the proliferation of corruption and bribery within society, weakening the private sector, diminishing trust in financial markets, reducing government revenue, and strengthening the financial resources and networks of criminals. The negative repercussions of this malignant phenomenon have prompted governments worldwide—alongside international entities—to combat it by enacting necessary laws and regulations, thereby preventing the occurrence of this crime in financial institutions or identifying and referring offenders to judicial authorities (Central Bank of Iran website).

Implementing a strict control program in one country will not be effective without its execution in neighboring countries, as it would lead to the formation of a kind of free zone for money laundering, becoming a destination for illegal financial flows (Veiga et al., 2006). This underscores the necessity for countries to adhere to international anti-money laundering laws and conventions such as the Vienna Convention, Basel Committee Charter, 1990 European Union Charter, EU directives, International Organization of Securities Commissions resolutions, Palermo Convention, and the Financial Action Task Force (FATF) regulations. This necessity is now being seriously recognized by most countries, to the extent that they have incorporated the rules and directives resulting from these conventions into their domestic laws. Consequently, those countries that are outside these regulations have become isolated. Iran is among these countries, which are on the FATF's blacklist. Although measures have been taken to combat money laundering— as one of the goals of this task force and a requirement for joining it—such as creating cash declaration forms, making amendments to the Anti-Terrorism Financing Law and Money Laundering Law, and approving anti-money laundering regulations, these efforts have been deemed insufficient by the recent statements from this organization. They emphasize that financial institutions in this country must ensure that banking transactions contain complete information about the originator and beneficiary. All of these factors have rendered Iran as a high-risk country for global financial systems.

Measuring the scale of money laundering in Iran faces many limitations. For instance, the unavailability of suspicious financial transactions—which is essential for measuring money laundering using the latest version of the gravity model presented by Ferweda et al. (2018)—renders the use of this method impossible for this country. Additionally, statistics on many criminal activities are not published annually and regularly, which further limits the use of other gravity models in Iran. This situation highlights the importance and appeal of researching methods for assessing money laundering relevant to this country and selecting appropriate methods. Such research could provide a clearer picture of this free zone for money laundering from the FATF perspective, revealing the economic impacts of money laundering to the authorities and the public, and illustrating the importance of law and order in combating money laundering. As Unger (2009) posits, a prerequisite for legislating anti-money laundering policies

and preventing the economic, social, and political damages of money laundering is understanding how significant amounts of money are laundered.

Most domestic studies in Iran have focused on the method proposed by Bhattacharyya (1996) and the model-based approach. In Bhattacharyya's method, the demand for cash is introduced as an index for dirty money—a method that does not adequately address the complexities of the money laundering process, especially with the intricate financial tools and multiple domestic and international markets involved. Moreover, model-based approaches are classified under Unger's (2009) categorization as related to the shadow economy. Since money laundering encompasses a broader definition than the underground economy and the shadow economy, extending to white-collar crimes that are not part of the shadow or underground economies, model-based methods tend to underestimate or overestimate the scale of money laundering.

However, other various approaches and methods used worldwide, while not without flaws, have been able to shed light on different aspects of this complex process. Therefore, this study is inspired by the work of Hendriyetty and Grewal (2017), which aimed to introduce approaches and methods suitable for measuring money laundering in developing economies. Considering the informational limitations in the Iranian economy, a combination method with focusing on capital flight approach—conceptually closer to money laundering—was selected. This method was then employed to estimate the scale of money laundering for a period of 28 years from 1995 to 2022.

The results of the study indicate that approximately $553 billion was laundered in Iran over the 28-year period examined, yielding an average annual figure of about $20 billion. The highest amount of money laundering in Iran occurred in 2011, with nearly $55 billion laundered, which is more than two and a half times as much as the average annual figure and about one-tenth of the total money laundering recorded during the 28 years studied. The observations also reveal that the lowest level of money laundering was around $4.8 billion in 2001. By comparing the peak and trough years of money laundering in Iran with the FATF statements regarding the country's economy, a suitable analysis of the reasons for these fluctuations can be achieved. The year 2001 coincided with the events of September 11, prompting the FATF to direct its attention to the issue of terrorist financing, leading to the adoption of eight

recommendations in this regard. In the 2011 FATF statement, which coincides with the highest volume of money laundering in the country according to the calculations, Iran was urged to urgently address its shortcomings in combating money laundering and terrorist financing, particularly by criminalizing terrorist financing and effectively implementing requirements for suspicious transaction reporting (STR). Moreover, all members and jurisdictions were asked to pay special attention to Iranian financial institutions and implement effective countermeasures to protect their financial sectors from the risks of money laundering and terrorist financing emanating from Iran. This effectively reminds stakeholders of the FATF’s perspective on identifying the causes of the high volume of money laundering in Iran and suggests that addressing these issues requires a transformation in Iran's political economy and, until then, its confrontation with the financial and commercial systems of other countries.

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ارزیابی حجم پولشویی در اقتصاد ایران با استفاده از رویکرد فرار سرمایه

چکیده:
پولشویی عبارتست از پنهان کردن منشأ غیرقانونی عواید به‌دست‌آمده از فعالیت‌های مجرمانه به‌طوری‌که به نظر برسد از منابع قانونی سرچشمه گرفته‌اند. این پدیده دارای آثار و تبعات منفی فراوانی در عرصه‌های مختلف اقتصادی و اجتماعی است لذا حاکمیت کشورها ـ همگام با مراجع بین‌المللی ـ در صدد مبارزه با آن، از طریق تصویب قوانین و مقررات لازم و اجرایی کردن آن‌ها برآمده‌اند. این همگامی بدین دلیل صورت می‌گیرد که از ایجاد منطقه آزاد برای پولشویی جلوگیری شود و کارایی اجرایی شدن این مقررات را با اختلال روبرو نکند. ایران به دلیل قرار داشتن در لیست سیاه کارگروه اقدام ویژه مالی از منظر این کارگروه یک منطقه آزاد محسوب می‌شود. همین امر نیز تحقیق در زمینه ارزیابی روش‌های پولشویی متناسب با این کشور و انتخاب روش مناسب را حائز اهمیت و جذاب می‌کند. بنابراین، مطالعه حاضر با استفاده از نتایج مطالعه هندریتی و گراول (2017) و با توجه به محدودیت‌های اطلاعاتی کشور ایران، روش ترکیبی رویکرد فرار سرمایه را به منظور شاخصی برای اندازه‌گیری پولشویی استفاده نمود. نتایج تحقیق حکایت از آن دارد که طی دوره 28 ساله از سال 1995 تا سال 2022، در مجموع حدود 553 میلیارد دلار در ایران پولشویی شده است که به صورت میانگین سالانه عددی حدود 20 میلیارد دلار را به دست می‌دهد. بیشترین میزان پولشویی در ایران مربوط به سال 2011 است که طی آن تقریباً 55 میلیارد دلار پولشویی در کشور صورت گرفته است. همچنین مشاهدات، کمترین میزان پولشویی را در حدود 4 هزار و 800 میلیون دلار در سال 2001 نشان می‌دهند.

کلمات کلیدی: پولشویی، رویکرد فرار سرمایه، روش ترکیبی