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## MACROECONOMIC IMPLICATIONS OF US SANCTIONS ON IRAN: A SECTORAL FINANCIAL BALANCES ANALYSIS

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### **Abstract:**

*Iran is facing a severe macroeconomics crisis after the US (re)imposed sanctions on its oil and gas exports in May 2018, followed by additional sanctions on metal exports in 2019. Its exports have collapsed triggering a contraction of the economy along with accelerating inflation and depreciating currency. Using the sectoral financial balances (SFB) model, we study the interrelationship between several macroeconomic parameters maintaining stock-flow consistency across time and sectors of the economy. Fiscal and monetary policy cannot reverse the consequences of the sanctions although fiscal deficits as a percentage of GDP will see a rise to accommodate the domestic private sector's desire to accumulate financial asset accumulation. The lack of a strong monetary policy mechanism in Iran may, however, be unable to quell the impact of expansionary fiscal policy on inflation and depreciating rial. Given the limited macroeconomic policy options open to Iran in dealing with the crisis Iran, the only option may be political – a return to the negotiating table with the US.*

**Key words:** *Iran, US sanctions, sectoral financial balances, macroeconomic crisis, fiscal policy*

### **1. Introduction**

The threat of war with the United States of America looms over the Islamic Republic of Iran. While Iran's priorities may not be purely economic at present, macroeconomic policy will nonetheless plays an important part in how this predicament plays out in the course of the next few months. The economic "shock" to Iran actually began more than a year ago on 8 May 2018 when the US President Donald Trump announced withdrawal from the nuclear deal JCPOA (Joint Comprehensive Plan of Action)

with Iran. This essentially meant the (re)imposition of sanctions on Iran, which came into effect in November 2018, resulting in the weakening of its currency (the *rial*) and a decline in Gross Domestic Product (GDP). Before the sanctions had come into effect, the International Monetary Fund (IMF) had estimated that between March 2018 and March 2019, Iran's GDP would increase by about 4 percent. However, post-sanctions, the IMF in its "World Economic Outlook" (IMF 2019) knocked down its estimates by some 10 percent to negative 6 percent; Iran was heading into a severe economic recession.

With crude petroleum amounting to 72 percent of its exports, Iran's economy has always been susceptible to shocks emanating in the market for oil. After the global financial crisis of 2008, oil and gas export revenues decreased from US\$ 82.4 billion to US\$ 66.2 billion dragging down GDP growth rate from 8 percent in 2007 to less than a percent in 2008 (IMF 2011, p.21). The US imposed sanctions on Iran due to disagreement over nuclear policies in 2012, had resulted in a massive 50 percent fall in oil and gas export revenues that pulled Iran's growth rate down from about 3 percent in 2011 to a negative 8 percent in 2012 (IMF 2014, p. 37). The situation presently is more alarming than ever; GDP growth has begun stalling, unemployment persists at high levels, the current account balance is slipping into negative territory after decades and the rial is in free fall.

Given Iran's overarching dependency on oil and gas exports has given the United States an important economic lever – sanctions – in influencing Iran's foreign policy and balance of power in the Middle East. It is no wonder then that Iran perceives the sanctions as nothing less than an "economic war" on it by the US. At the time of writing this paper, tensions with the US were in fact escalating after its drone was brought down by Iran. With a possible full-blown economic and political crisis imminent, this paper uses the Sectoral Financial Balances (SFB) model to look at the macroeconomic policy options available to Iran, if at all, to cope with its present predicament. Lessons from the previous episode of sanctions imposed in 2012 are particularly useful in this exercise.

## **2. The Sectoral Financial Balances (SFB) Model**

Following Sivramkrishna (2016), this section briefly presents the SFB model, developed by the heterodox economist, Wynne Godley. The economy is divided into three sectors, the domestic private sector comprising of firms and households, the domestic government sector and the finally, the external sector comprising of both the foreign private and foreign government sector. This model states that the net financial asset accumulation of the three sectors combined must add up to zero. In other words,

$$(S - I) + (T - G) + (M - X) = 0 \quad \dots\dots\dots (1)$$

Or,

$$(S - I) = (G - T) + (X - M) \quad \dots\dots\dots (2)$$

where S = private sector financial savings, I = private sector investment, T = tax revenues of the government, G = government spending, M = value of imports and X = value of exports, all considered as a percentage of GDP. The equation also holds true for components expressed as absolute values.

A current account surplus (CAS), i.e.  $(X - M) > 0$  implies a net outflow of foreign exchange so that the domestic private sector is accumulating financial assets abroad or equivalently foreigners are accumulating financial liabilities.

Equation (1) and (2) are based on simple double entry bookkeeping wherein every financial asset must simultaneously give rise to a corresponding financial liability. If the domestic private sector as a whole desires to accumulate net financial assets outside itself, then either the domestic government sector and/or the external sector must accumulate financial liabilities.

Two pertinent questions must be raised here; first, why would the domestic private sector want to accumulate *financial* assets and second, why would it want to accumulate financial assets *outside itself*? Physical assets both cumbersome to hold (bulky, theft and legal issues), they are not always liquid and can lose value. Financial assets like equity, bonds and bank deposits are convenient and physically safer to hold. However, private sector financial liabilities are also risky and can lose value (equity shares, for instance) because such liabilities are backed by physical assets like plant and equipment or property. This brings us to the next question; why does the private sector desire to hold assets outside itself? A government bond is usually considered a safe financial asset since it is not backed by any physical asset but rather by the ability of the state to issue its own currency. Savings of households and private sector businesses would therefore include physical assets and financial assets, the latter comprising of both, private sector liabilities (which may give higher yields) and government securities (for safety). A lack of adequate options may drive households and firms to raise their propensity to save as they look for financial security through greater diversity.

It is possible that the domestic private sector accumulates financial liabilities outside of itself by borrowing (credit) from the government or external agencies. However, such leveraging is not sustainable over the longer run since these liabilities will have to be settled in a reasonable period of time. On the other hand, an economically sovereign government can accumulate liabilities indefinitely.

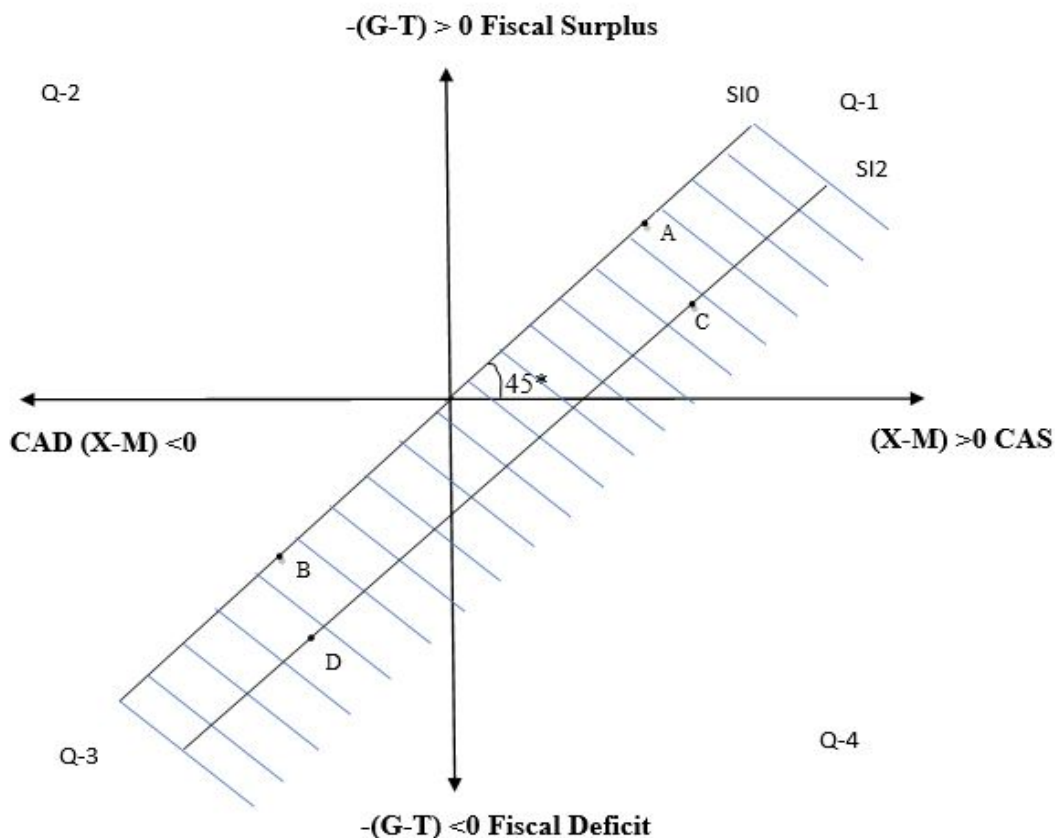
### **3. The SFB Template**

The SFB equation can be mapped on a 4-quadrant diagram with current account balances on the X-axis and fiscal balances on the Y-axis.

The line  $Sl_0$  drawn in Figure 1 is where  $S - I = 0$ . Consider a point A on the line  $Sl_0$ . Here  $-(G - T)$  or the fiscal surplus is equal to the current account surplus (CAS), i.e.  $(X - M)$ . From equation (3),  $S - I = 0$ . Similarly at point B, the fiscal deficit  $(G - T)$  is equal to the current account deficit (CAD), i.e.  $-(X - M)$  so that  $(S - I) = 0$ . The line  $Sl_0$  is therefore a locus of points where  $S - I = 0$ . Now consider a point such as C. Here the CAS i.e.  $(X - M)$  of (say) 6 percent is greater than the fiscal surplus  $-(G - T)$  of (say) 4 percent so that the private sector is able to accumulate net financial assets amounting to 2 percent of GDP. Similarly, at point D, if the CAD i.e.  $(X - M)$  of (say) - 2 percent is less than the fiscal deficit  $(G - T)$  of (say) 4 percent then the private sector is able to accumulate net financial assets amounting to 2 percent of GDP. The line  $Sl_2$  is therefore a locus of points where the private sector accumulates financial assets equal to two percent of GDP. Interestingly, the SFB template makes it clear that a country running CAD must run fiscal deficits if the domestic private sector is accumulating net financial assets outside itself. In general, all points in the shaded region indicate positive net financial asset

accumulation by the domestic private sector and therefore the sustainable region for the economy in the longer run. The unshaded portion to the left of  $SI_0$  is, however, one where the domestic private sector is accumulating net financial liabilities and indicates the possibility of imminent deleveraging by the private sector to repay debt.

**Figure 1: The SFB template**



A word of caution is necessary in using the SFB model for macroeconomic policy analysis. While the SFB must hold true as it is derived from double entry book keeping it does not establish cause and effect. However, by carefully selecting and interpreting changes in key macroeconomic parameters while at the same time, maintaining stock-flow consistency, the SFB model can throw light on policy options available to the government in order to meet its objectives. The present Iranian crisis serves as an interesting case study in utilization of the SFB model for the study of macroeconomic policy.

#### **4. A Preliminary Exploration of the SFB Equation for Iran**

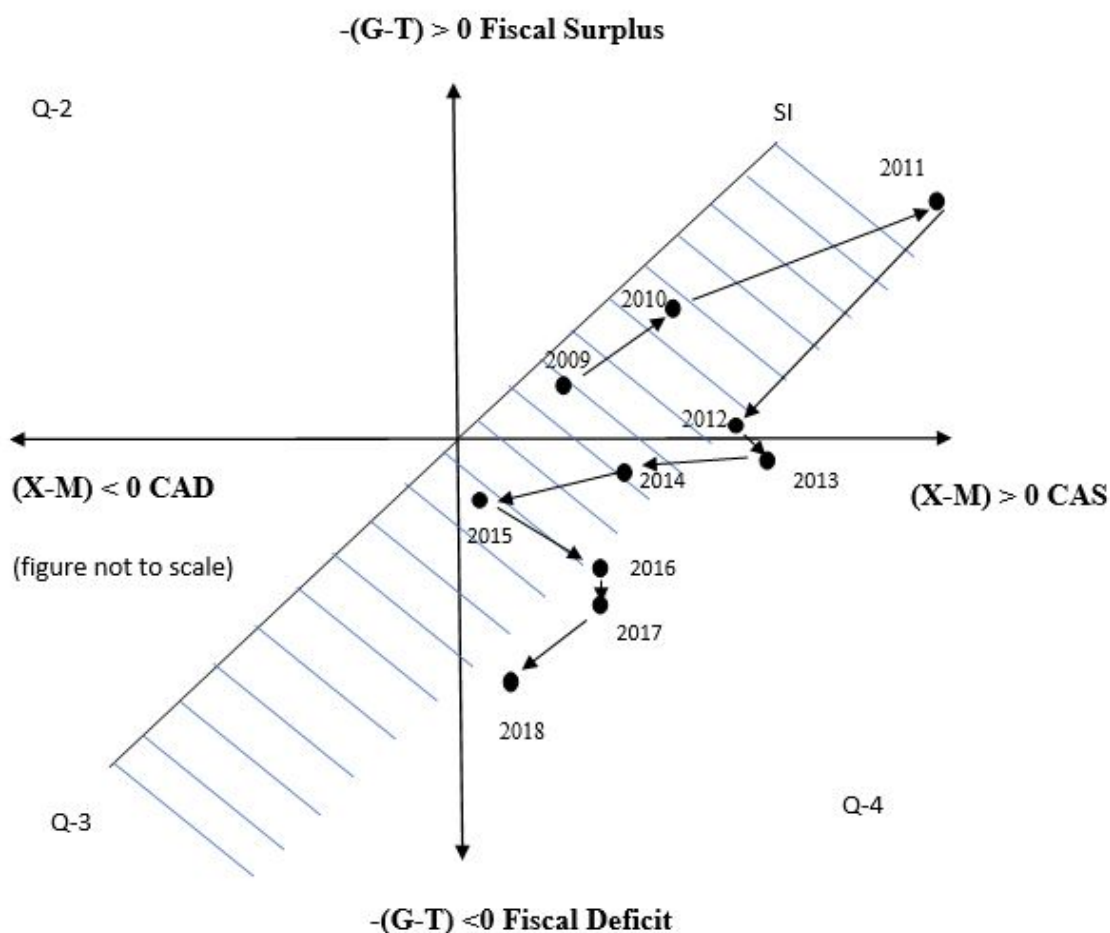
We begin with a simple mapping of the SFB equation on to the SFB template for Iran. Using data on the reported fiscal balances and current account balances we compute in Table 1 below the quantum of net financial asset accumulation by the domestic

private sector from equation (2). This is based on the argument made by Koo (2011) that data on private sector savings is usually not reported and given that Equation (1) is essentially an accounting identity, it is appropriate to compute  $(S - I)$  from the sectoral balances of the government and external sector, for which data is relatively more accurate.

**Table 1: SFB values for Iran, 2009 to 2018**

YEAR	G-T	X-M	S-I
2009	-0.8	2.14	1.34
2010	-2.6	4.22	1.62
2011	-0.6	10.45	9.85
2012	0.3	6.02	6.32
2013	0.9	6.69	7.54
2014	1.1	3.21	4.31
2015	1.8	0.33	2.13
2016	2.3	4.03	6.33
2017	1.8	4.26	6.06
2018	3.9	1.3	5.20

**Figure 2: The SFB Template for Iran**



A cursory analysis of the SFB template tells us that the Iranian private sector has been able to maintain net financial asset accumulation over the entire period in spite of the sanctions of 2012-15 and even in 2018. The issue of its deleveraging therefore does not seem to pose an immediate threat. However, as the US sanctions become tighter, and there is every reason to believe that they will at the moment, a fall in oil exports will take Iran into a current account deficit zone so that any increase in desired net financial asset accumulation will necessitate larger fiscal deficits. This situation began to reveal itself after the 2012-sanctions in 2014-15 when Iran's CAS began to shrink.

This simple mapping of the SFB equation is, however, inadequate to understand Iran's current economic predicament. Most importantly, while the SFB equation is usually presented in terms of a percentage of GDP, what could be easily overlooked is the value of its components in absolute terms. This is indeed the situation in Iran with its decline into recession induced by the shock of sanctions on its oil and gas exports. A simple numerical example can illustrate this point:

Suppose value of exports = US\$20 and value of imports = US\$15 with GDP = US\$100, then CAS = 5 percent of GDP.

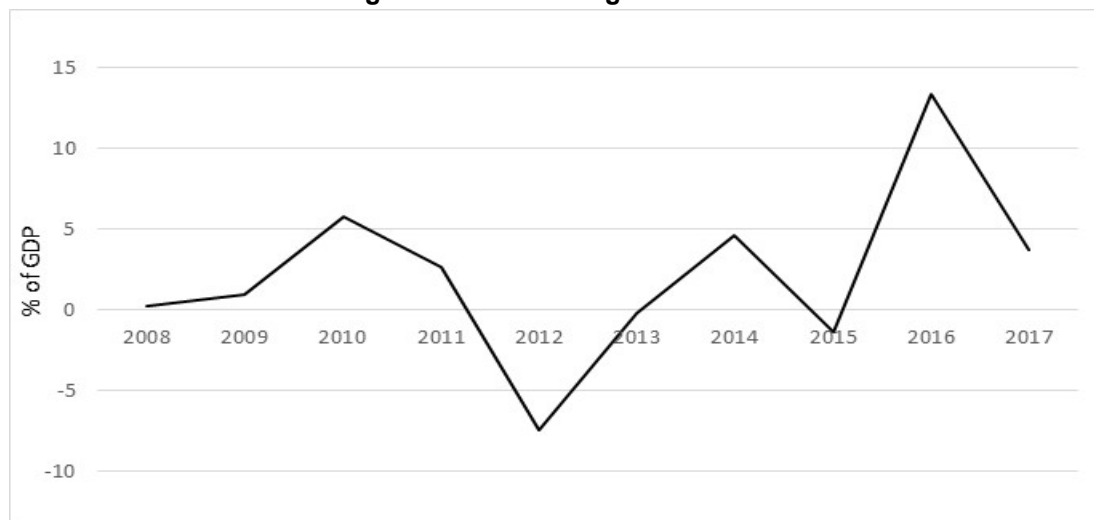
Suppose after a severe decline in exports and GDP contraction, we have: Value of exports = US\$10 and value of imports = US\$7.5 with GDP = US\$50, then CAS still remains at 5 percent of GDP.

However, are the two situations the same? Obviously not; ignoring this important fact – whether it is on current account balances, fiscal deficits and/or the savings rate – could render the conclusions drawn from the SFB model inadequate and muddled. The case of Iran shows that a more in-depth analysis of trends in key macroeconomic parameters is essential if we are to draw important insights into and make inferences on macroeconomic policy from the SFB equation.

## **5. Some Key Macroeconomic Parameters of the Iranian Economy**

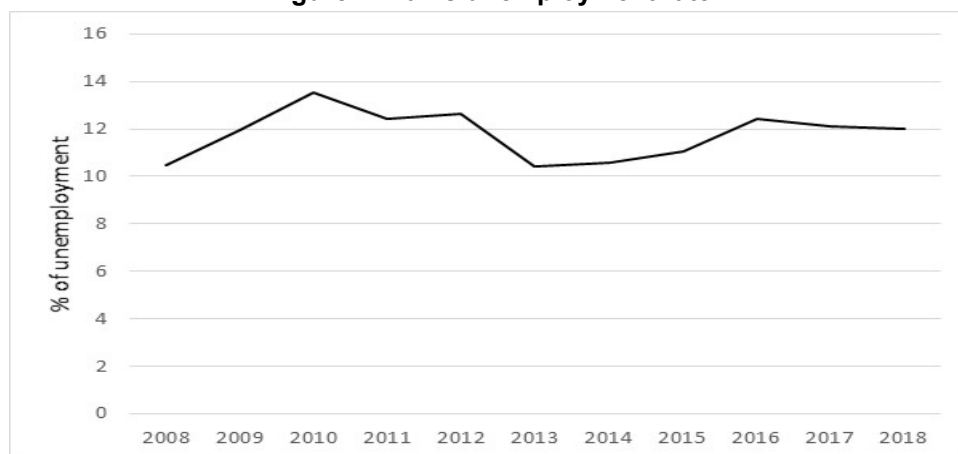
Iran is a middle income country with a per capita income at roughly US\$5,000 and US\$21,000 in PPP terms. With a population of about 82 million, Iran ranks 60<sup>th</sup> in the world on the human development index; its absolute score being close to 0.8. Estimates of absolute poverty, however, vary from 13 percent to almost a third of the population (Radio Farda 2018).

Iran's GDP growth rate has constantly fluctuated widely from lows of almost –10 percent in 2012 to highs of almost +15 percent in 2016 (Figure 3). The primary reason for this variance in GDP growth are sanctions imposed on Iran on account of its antagonistic political relations with the West emanating from its nuclear program. To constrain it from producing nuclear weapons, the US and EU have consistently used economic sanctions, both on trade and financial transactions (IMF 2014, p. 9), that have wrecked the possibility of a stable growth trajectory for Iran. In addition to these politically motivated shocks, Iran as a major petroleum producer, is also severely impacted by international oil and gas demand and prices. As we will see, efforts to mitigate their impacts have been rather limited in their effectiveness.

**Figure 3: Iran's GDP growth rate**

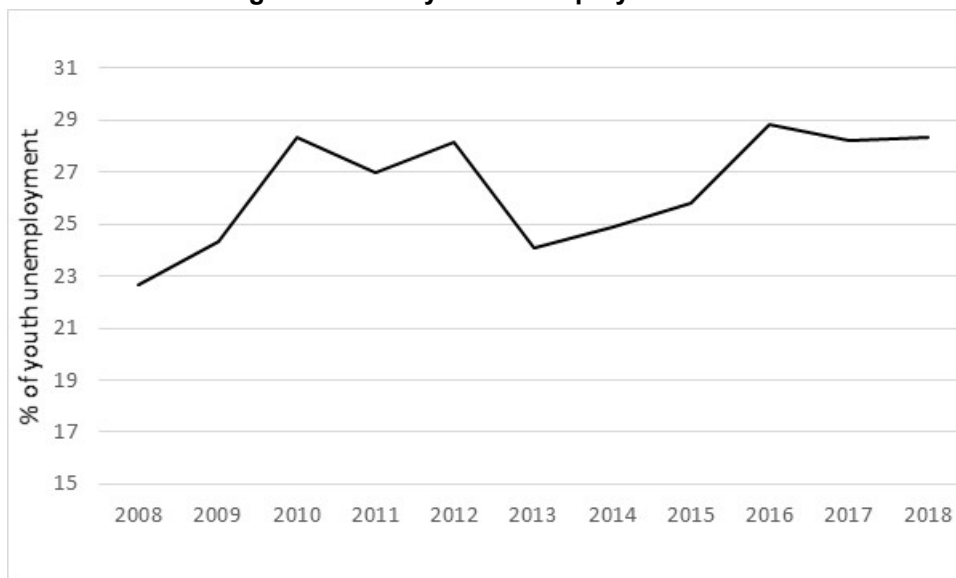
Source: <https://tradingeconomics.com/iran/gdp-growth-annual>

The ultimate objective of macroeconomic policy is full employment; Iran has failed to come close to this target with unemployment remaining close to or above the 10 percent level over the last decade (Figure 4). Of even greater concern is the alarmingly high level of youth unemployment in Iran (Figure 5), which presently stands at 28 percent. There is widespread discontent and frustration among the youth of Iran as most of them are educated but are unable to find jobs.

**Figure 4: Iran's unemployment rate**

Source: <https://tradingeconomics.com/iran/unemployment-rate>

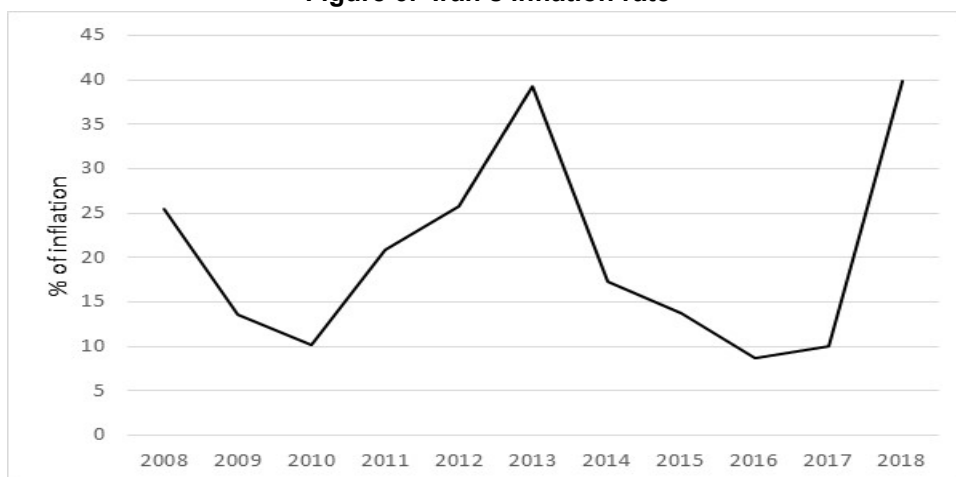
Figure 5: Iran's youth unemployment rate



Source: <https://tradingeconomics.com/iran/youth-unemployment-rate>

Accelerating inflation especially during period of sanctions (Figure 6), persistent unemployment and erratic growth rates together starkly reveals the nature of Iran's economic crisis. For a major oil exporter this is unfortunate as it is unable to use its bounty of natural resources to stabilize its economy. The punishment that the West has imposed has certainly taken a toll on the standards of living and economic security of Iranians.

Figure 6: Iran's inflation rate



Source: <https://tradingeconomics.com/iran/inflation-cpi>

## 6. Delving Deeper into Iran's External Sector

With exports of goods and services at close to 25 percent of GDP and imports at roughly 24 percent of GDP in 2017 (Global Economy), foreign trade in goods and services account for almost half of Iran's GDP. Out of the total exports, the share of oil and gas

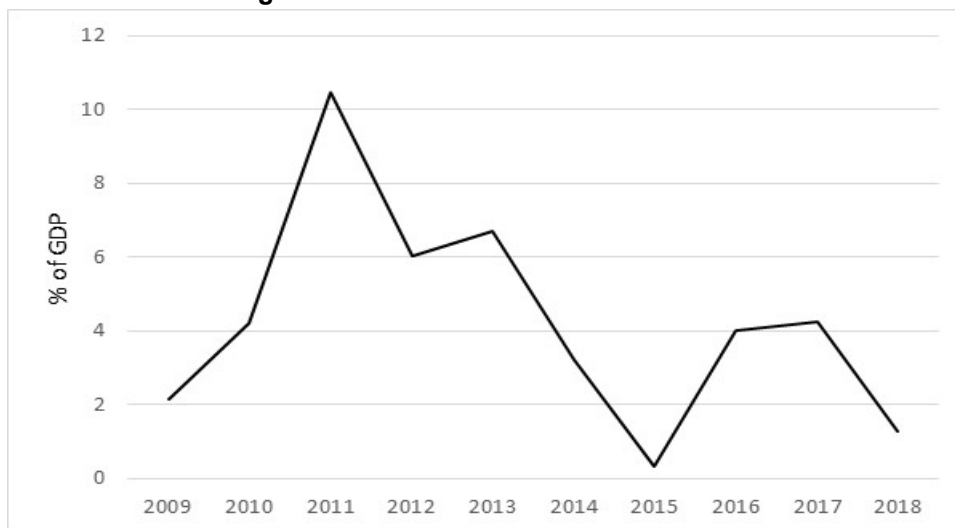


exports account for some 72 percent, a substantial portion of the remaining exports comes from petrochemicals, iron ore and steel exports (Fallahi 2018). Iran's metal exports – iron, steel, aluminium and copper – which are the largest non-petroleum-source of export revenue accounts for about 10 percent of its export economy (The Wire 2019). The present episode of US sanctions has targeted both these items, hitting Iran hard by starving it of its primary source of foreign exchange.

On the import front, although US sanctions do not cover food and medical supplies, the restrictions on financial transactions have impacted Iran's access to foreign products. Iran, which "relies heavily of imported food staples" (Reuters 2018a) is increasingly concerned over impact of the sanctions on the availability of daily food items as rationing and queues outside shops grow. A report in May 2019 tersely captures the precarious situation developing in Iran: The government banned livestock exports last August to avoid shortages at home as sanctions came into force, but farmers instead smuggled animals abroad to obtain foreign currency. To stem public discontent, it has airlifted in hundreds of thousands of cows and sheep, as well as extra supplies of beef and lamb from Romania, Australia and Brazil for cut-price sale to low-income families like Mokhtari's (Bloomberg 2019).

As seen in Figure 7 below, the impact of US sanctions has, without a shadow of doubt, plunged Iran's external sector into a crisis, both in 2012-15 and since late 2018. With oil exports plummeting to less than half a million barrels per day in May 2019 from more than 2.5 million barrels per day in April 2018 (Reuters 2018b), the sanctions have taken Iran from a surplus towards a deficit in its current account.

**Figure 7: Iran's current account balance**

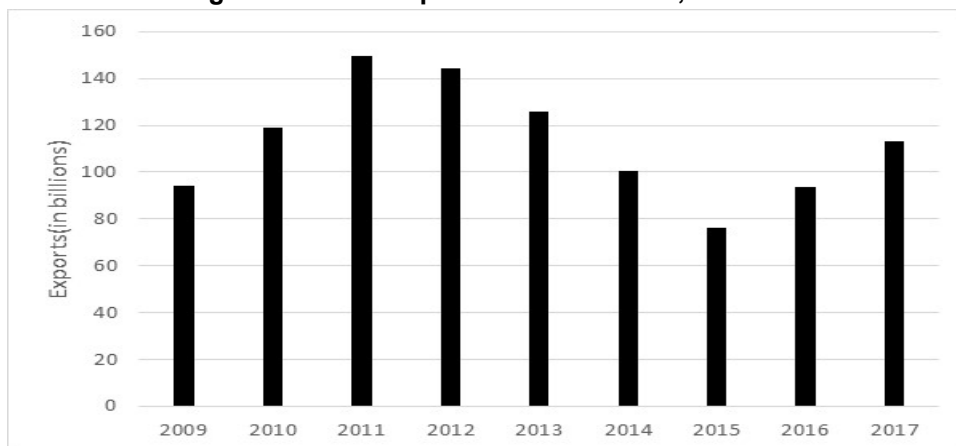


Source: <https://tradingeconomics.com/iran/current-account-to-gdp>

The overall current account balance, however, does not capture the impact of sanctions adequately. If we look at the value of exports in dollar terms during the previous round of sanctions in 2012-15 (Figure 8), it becomes clear why this is nothing less than a shock; a 60 percent fall in (dollar) exports. There is no reason to believe that the present

US sanctions will have the same, if not even worse, impact on Iran's exports with oil exports shrinking by 88 percent by July 2019 (Cole 2019).

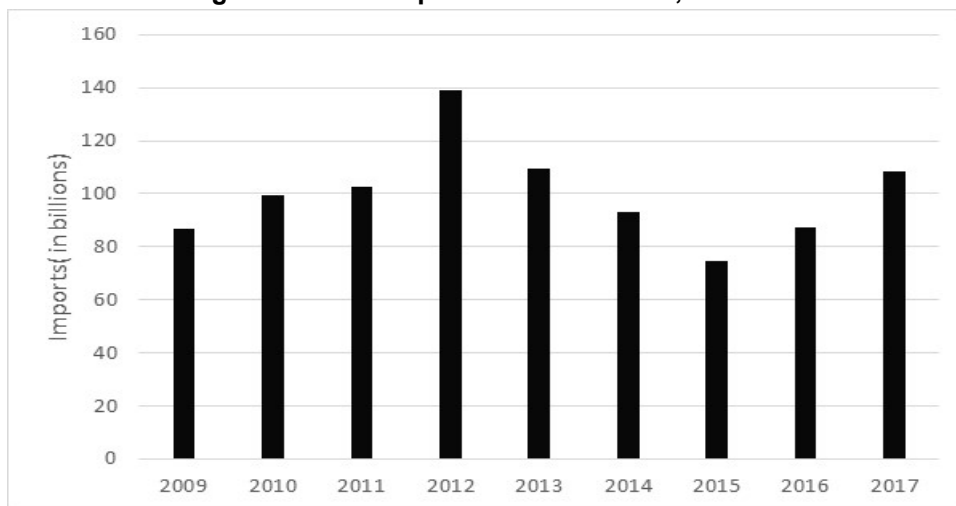
**Figure 8: Iran's exports in dollar terms, 2009-17**



Source: <https://tradingeconomics.com/iran/exports>

Furthermore, the fall in the rial and the restrictions on financial transactions will also contract Iran's imports as evident from the impact of sanctions in 2012 (Figure 9).

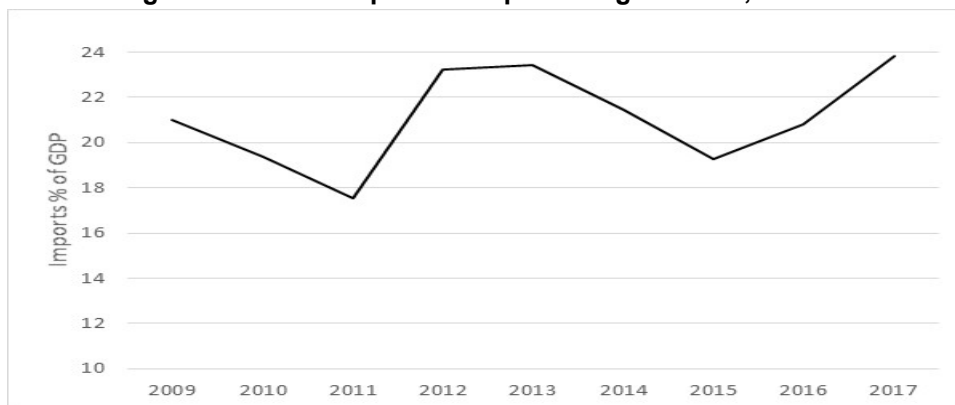
**Figure 9: Iran's imports in dollar terms, 2009-17**



Source: <https://tradingeconomics.com/iran/imports>

In spite of a severe contraction of imports of up to 50 percent during the sanctions of 2012-15, it is important to note that imports as a percentage of GDP does not show a fall to the same extent (Figure 10).

Figure 10: Iran's imports as a percentage of GDP, 2009-17



Source: <https://www.theglobaleconomy.com/Iran/Imports/>

This is possible only if GDP itself is contracting at the same time (the denominator must be contracting along with the numerator). The argument that is being emphasized here is that the declining current account surplus must be seen as not merely an outcome of falling exports but in a situation of falling exports *along with* declining imports and contracting GDP as illustrated in the numerical example above. Unfortunately, this significant fact can be missed out with a simplistic analysis of the external balance as a percentage of GDP.

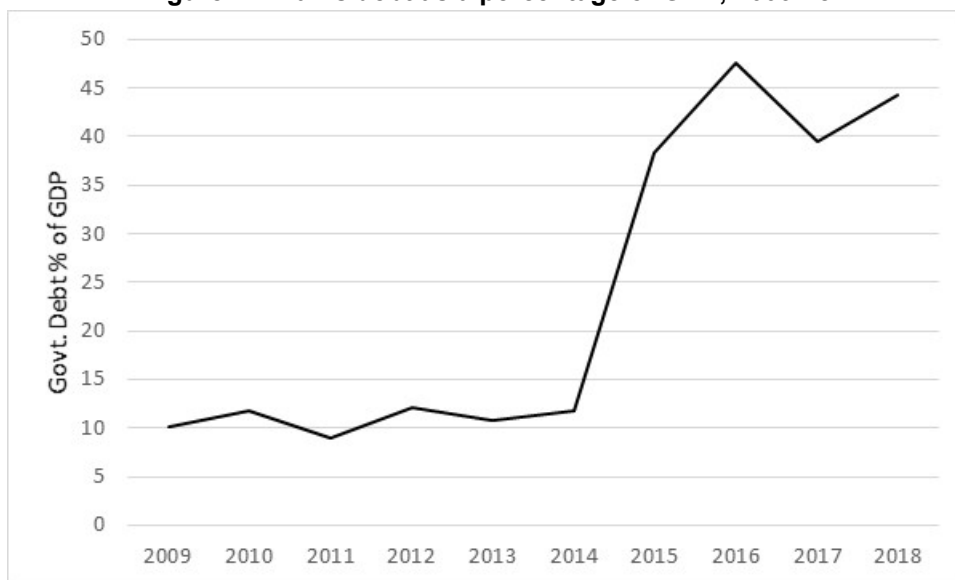
## 7. Iran's Resource Curse

Like all oil exporting countries, Iran too has had to face up to the "resource curse"; high oil export revenues would mean a large inflow of dollars (and other foreign currencies) that would lead to an appreciation of the rial, cheapen imports and render most domestic industries uncompetitive. The only solution was to prevent the inflow of dollars into the foreign exchange markets. Iran therefore set up Oil Stabilization Fund (OSF) and National Development Fund (NDF) in 2010 and 2011 respectively. Although a detailed presentation of these institutions is beyond the scope of this paper and may be found elsewhere (National Resource Funds 2014), understanding Iran's macroeconomic policies without considering the important role of these institutions would be inadequate.

Iran's oil exports are done through the government owned, National Iranian Oil Company (NIOC). Instead of the whole receipts (after the NIOC retains a part of the foreign exchange proceeds) being transferred into the account of the government, it is apportioned by the OSF for various purposes, which includes a portion used to fund the domestic budget. However, the dollars are not spent in the domestic economy by the Iranian government; instead, the amount of dollars is transferred to the CBI by the government in exchange for a credit of rials in its account held at the central bank. These rials are then spent into the economy through the banking system. The dollars are held as foreign exchange reserves – an asset – of the CBI, and are utilized for imports and other capital account transactions. The key point that must be highlighted here is that the corresponding amount spent by the government in rials does not add to the fiscal deficit or to the issue of public debt. To put it simply, the government is spending a part of its earnings from oil exports rather than by raising this amount through issue of bonds or

public debt. However, post-sanctions of 2012, Iran had to raise the level of public debt domestically in rials with the dollar inflows constrained (Figure 11). Nonetheless, even with low deficits and debt, the CBI has had to deal with the additional liquidity in the commercial banking system and its inflationary impact – we will look at the challenges to monetary policy in Iran later in the paper.

**Figure 11: Iran's debt as a percentage of GDP, 2009-18**

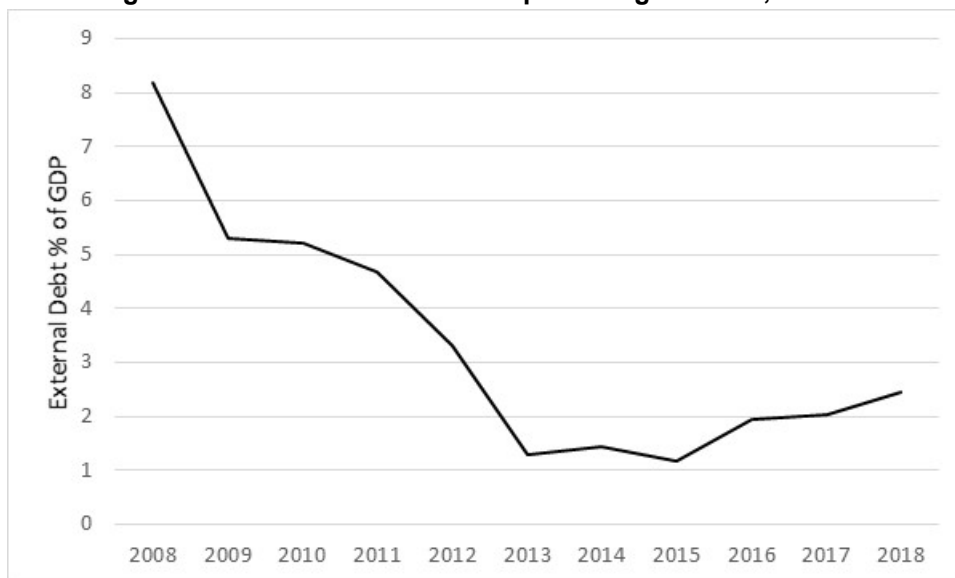


Source: <https://tradingeconomics.com/iran/government-debt-to-gdp>

The dollar revenues earned from oil and gas exports were also routed through the OSF and NDF “to provide loans to private-sector companies, cooperatives and economic enterprises owned by public non-governmental institutions through agent banks to make investments to promote economic growth and reduce poverty” (Natural Resource Funds 2014). These loans were to be specifically utilized for foreign purchases and had to be repaid in foreign currency only. While the nominal interest rates were low, the foreign exchange risk-adjusted rate proved to be too high and unattractive for many genuine investment projects although substantial sums of money have been disbursed.

The Iranian government has, therefore, been injecting its dollar revenues (after conversion into rial) from its export earnings. This is one reason why inflation rates have been elevated in Iran despite fiscal surpluses (prior to 2012) or low fiscal deficits (except after the 2018 sanctions).

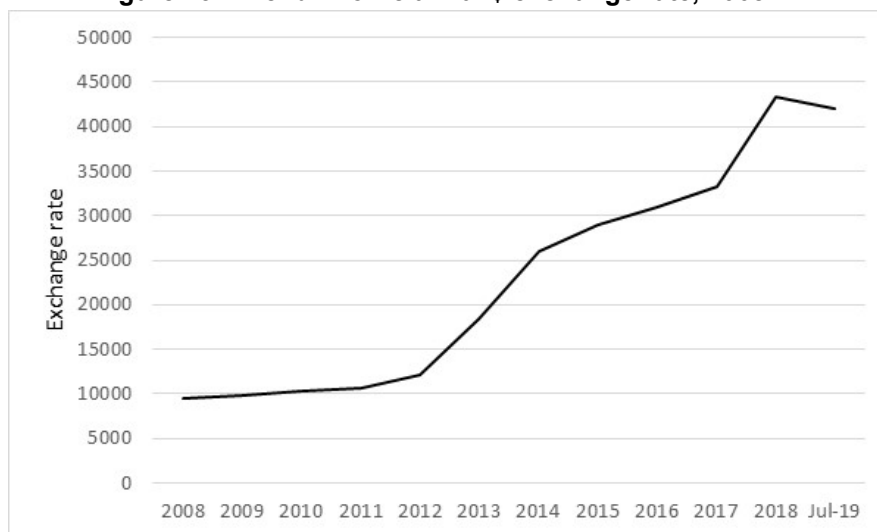
An upside of Iran's oil exports is that debt owed by Iran by both the public and private sector to foreign creditors has been kept low as can be seen in Figure 12. In fact, over the years Iran has managed to reduce its external debt as a percentage of GDP.

**Figure 12: Iran's external debt as percentage of GDP, 2008-18**

Source: <https://www.ceicdata.com/en/indicator/iran/external-debt--of-nominal-gdp>

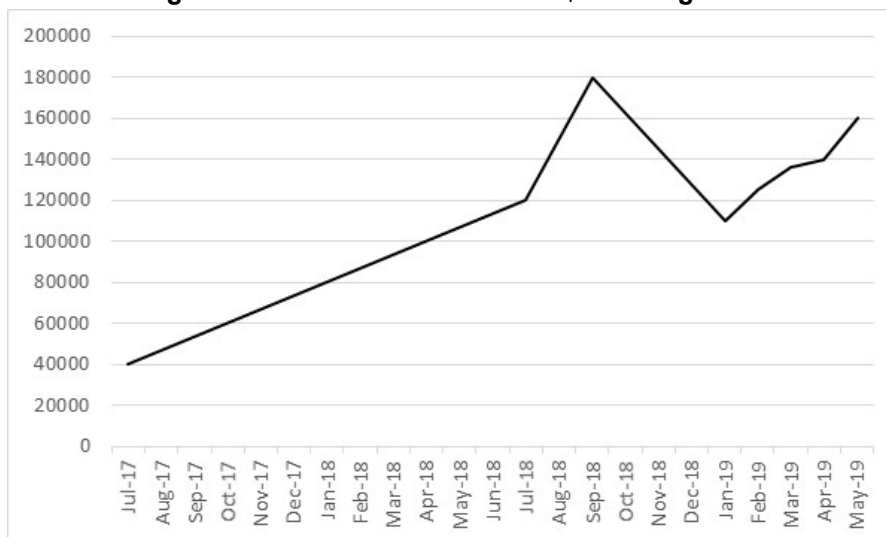
## 8. Iran's Exchange Rate Crisis

An important parameter in the external sector is the foreign exchange rate. Once again the Iranian situation is not straight forward with a multitude of exchange rates; different rates for different transactions. In spite of the official unification of exchange rates in 2011 by the CBI, multiple exchange rate system continues. Broadly speaking, we look at the official and unofficial (market) rates in Figures 13 and 14 (BBC 2019) below.

**Figure 13: Trend in official rial/\$ exchange rate, 2008-17**

Source: <https://tradingeconomics.com/iran/currency>

Figure 14: Trend in unofficial rial/\$ exchange rate



Source: based on data from <https://www.bbc.com/news/world-middle-east-48119109>.

The official exchange rate has been held at an overvalued rate to cheapen cost of imports of selected products – made possible from the sale of dollars held as reserves by the CBI – while the unofficial market rate reflects the actual demand-supply position for foreign exchange. While there is some truth in the argument that profligate government spending and the resultant inflation are the cause of the depreciating rial (Plaut 2013) there is no doubt that sanctions act as a shock in the currency market. A cursory look at Figure 13 and 14 above shows the plunge in the rial since the 2018 sanctions.

The inelasticity of exports on account of sanctions, the inelastic nature of essential imports as well as its anticipated depreciation is driving the rial into free fall, which in turn drives up domestic inflation rates. The anecdotal case of nappies made from imported raw materials illustrates Iran's predicament of imported inflation:

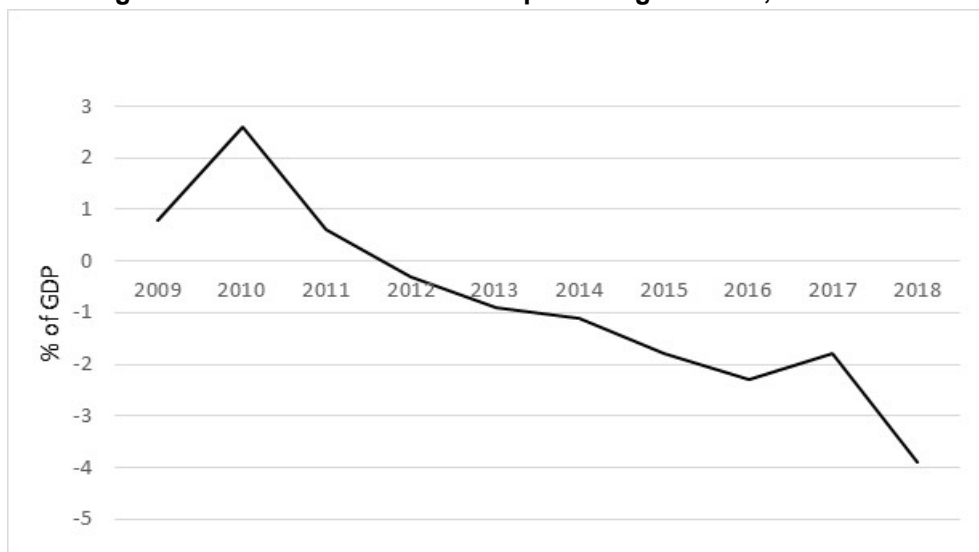
In one case, for example, the price of a pack of Iranian-made nappies rose from 380,000 rials (\$9; £7) in late April to 850,000 rials in late August - a 137% increase in just four months (BBC [2019](#)).

The relation between a falling exchange rate and rising inflation turn into a vicious circle, adverse expectations of each feeding into the other, leading to worse outcomes in both. What adds even more fuel to this raging fire is the desire of the domestic private sector to hold their savings either in foreign currency or gold as the value of the rial depreciates by the day – resulting in a self-fulfilling prophecy.

## 9. The Government Sector in Iran

A study of Iran's fiscal balance (Figure 15) also reiterates the dismal story of the impact of sanctions; increasing deficits as a percentage of GDP.

Figure 15: Iran's fiscal balance as percentage of GDP, 2009-2018



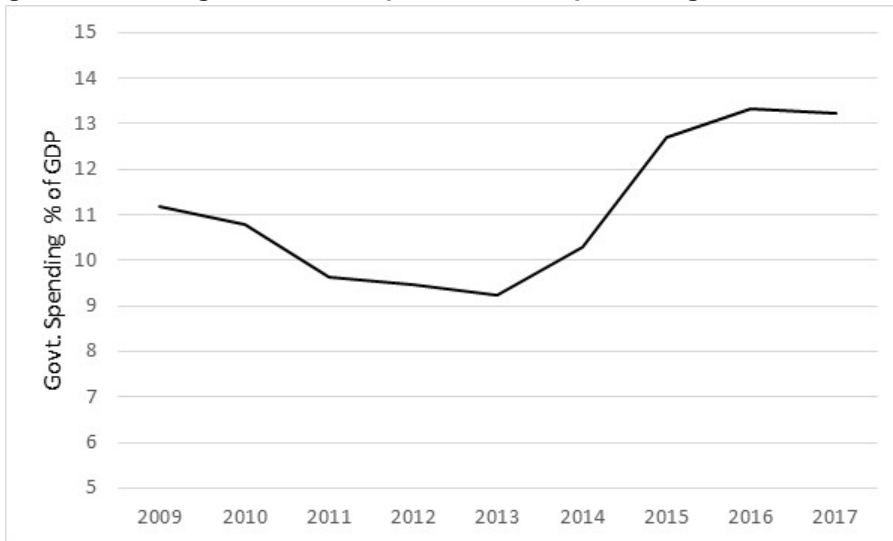
Source: <https://tradingeconomics.com/iran/government-budget>

Iran had maintained a fiscal surplus as an oil exporting country all through the early 2000s until the imposition of sanctions in 2012. The Iranian government then had to start running deficits to counter the impact of the sanctions on its revenues from oil exports. Recall that with dollar inflows, the spending of the government would not be reflected as a fiscal deficit but rather from its income.

The SFB equation for Iran illustrated in Figure 2 captures this relationship while maintain stock-flow consistency; a movement to the left along the X-axis and movement down along the Y-axis. If the domestic private sector in Iran desires to accumulate net financial assets outside itself, then either the foreign sector and/or the government must accumulate liabilities. With the foreign sector no longer accumulating liabilities as Iran's CAS gives way to a CAD, the government must run a deficit to meet the domestic sector's desire for asset accumulation.

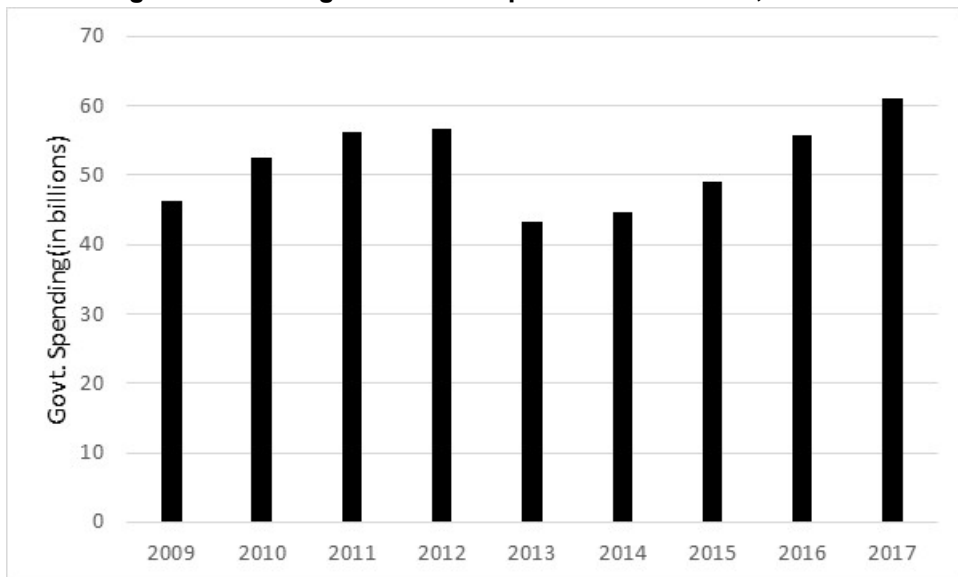
It is also important to observe that in the previous round of sanctions in 2012-15, the fiscal deficit as a percentage of GDP was increasing (Figure 16) while the quantum of government expenditure in dollar terms (Figure 17) was falling sharply. This, like we pointed out in the case of imports (Figures 9 and 10) is a clear indication of an economy in the grips of a severe GDP contraction. Moreover, it is then also likely that Iran's tax revenues as a percentage of GDP – as well as in absolute terms – were falling sharply to raise the overall fiscal deficit. Tax revenue data is, however, not available for Iran post-2007. Recent reports of Iranian authorities claim increase in tax revenue in 2019 (Radio Farda 2019a). This is, however, questionable given the steep contraction in GDP since sanctions were imposed.

**Figure 16: Iran's government expenditure as a percentage of GDP, 2009-17**



Source: [https://www.theglobaleconomy.com/Iran/Government\\_size/](https://www.theglobaleconomy.com/Iran/Government_size/)

**Figure 17: Iran's government expenditure in dollars, 2009-17**



Source: [https://www.theglobaleconomy.com/Iran/government\\_spending\\_dollars/](https://www.theglobaleconomy.com/Iran/government_spending_dollars/)

The ability of the OSF and NDF to counter the impact of sanctions by providing foreign exchange for imports (from reserves held at the CBI) actually allows for continuing imports ([Tasmin News Agency 2019](#)) in spite of plummeting exports. This effect of decreasing the CAS or aggravating the CAD (taking Iran leftward on the X-axis in Figure 2) must then be compensated with a higher fiscal deficit (downward on the Y-axis in Figure 2) to maintain a given level of net financial asset accumulation by the private sector (along any given SI line).



However, it is doubtful whether Iran can continue to sustain the level of imports given that funds were never used prudently. As one economist (Amuzegar 2005) pointed out some years ago:

The skepticism expressed by economists regarding the effectiveness of oil reserve funds in improving fiscal management seems to have been fully confirmed by the Iranian experience ...

... [the] handling of the OSF has thus shown the futility, if not indeed the absurdity, of setting up a rainy day fund if it can be freely used while the sunshine had never been brighter ...

From subsidies on food staples and medicines to those on energy and fuel products, the government has utilized oil revenues during good times, leaving little for periods of instability. While the poor may have benefitted from these expenditures it is apparent that the impact of sanctions cannot be overcome when the flow of oil revenues dry up. In such situations, the government resorting to increasing fiscal spending through larger deficits and issue of debt faces the extreme danger of acceleration in inflation and steep depreciation of its currency that have already been adversely and severely impacted within a period of just over a year since the sanctions were imposed.

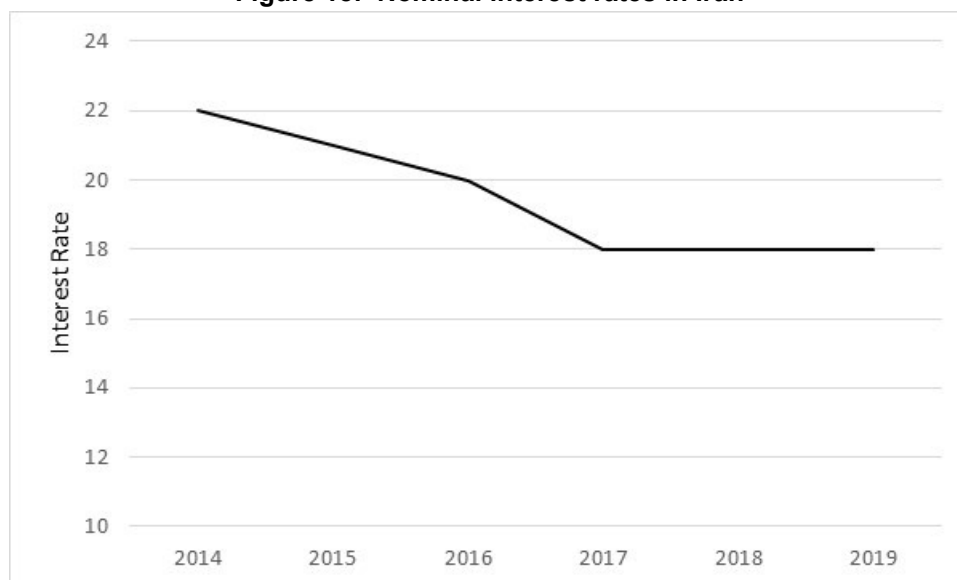
## **10. Monetary Policy in Iran**

Although fiscal deficits and public debt have been rather modest in Iran, the injection of export revenues into the economy by the government meant large spending from “income”. These were large sums – in the range of 60 percent of the annual budget (Amuzegar 2015) – which in some sense amounted to a distribution of the earnings from Iran’s natural resources amongst its people. With foreign exchange available, the country could import many essential goods and services, then distributed through subsidized schemes to a large section of the population. However, when there are shocks like sanctions and export revenues plummet, the country easily slips into a crisis. Government spending continues although with larger fiscal deficits but more importantly, the currency soon collapses alongside skyrocketing domestic inflation. This has been a standard feature of not just Iranian crises but also those witnessed in other oil exporting countries like Saudi Arabia (Sivramkrishna 2016) and Venezuela.

Large government spending also means that banks are flush with liquidity (larger reserve balances with the CBI) so that bank credit is easily available. In a country which follows the principles of Islamic banking, interest is formally prohibited (Plaut 2013) and therefore cannot be interpreted and understood as we do in standard macroeconomics. The system in Iran is essentially an artificial one where banks receive payments on loans dispersed and make payments on deposits - but these are neither “fixed” nor can they be called “interest”. With these “rates” for loans held below the inflation rate and remaining unchanged since January 2018 (see Figure 6 above and Figure 18 below) in spite of accelerating inflation – negative real rates of interest – an administrative rationing mechanism for dispersal of loans becomes necessary. The arbitrariness in granting of loans has manifested in a massive problem of non-performing loans (NPLs) on the balance sheet of banks. As one commentator puts it, “experts agree that most NPLs have resulted from politicized lending through corrupt networks” (Al Monitor 2018). At the same time, households are forced to look at more secure avenues to park their savings; foreign

exchange and gold are obviously the more attractive especially during times of high inflation and a rapidly depreciating rial.

**Figure 18: Nominal interest rates in Iran**



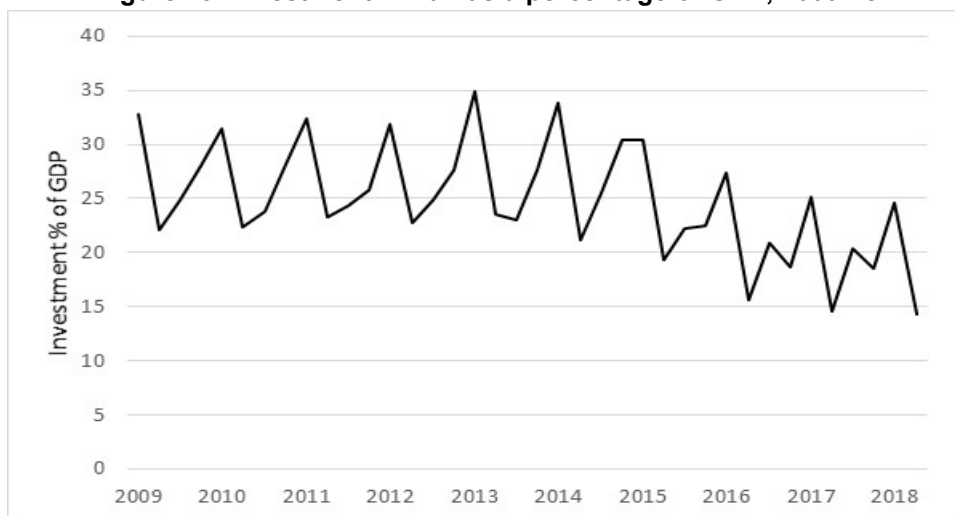
Source: <https://tradingeconomics.com/iran/interest-rate>

Although there are some signs that the CBI may be granted more autonomy in influencing interest rates through the use of open market operations (AI Monitor 2018), it is doubtful whether monetary policy can play an important role in controlling inflation. There is also the dilemma over the rate that must be set by the CBI – lower interest rates may increase the demand for loans which could increase the risk of higher NPLs and higher inflation while an increase in rates might help inflation but further squeeze the already contracting economy.

### 11. Iran's Domestic Private Sector

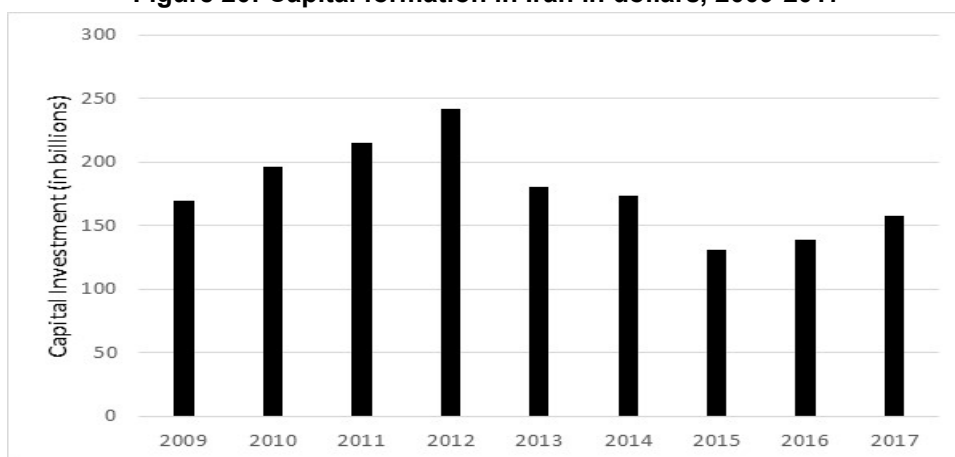
The SFB model indicates that Iran's domestic private sector has been able to accumulate net financial assets ( $S - I > 0$ ), during good times as well as under conditions of distress. While this may be seen as positive, what is missed out is that this has come at the cost of a contracting economy induced by sanctions.

First, private sector investment spending shows an unequivocal and significant downward trend (Figure 19). What is even more alarming is the fact that this is true even as a percentage of GDP, which in times of a contraction (lower denominator) implies lower investment spending in absolute terms (lower numerator). This can be seen in Figure 20; in particular, for the period 2012-15 when Iran was subject to sanctions. Moreover the larger non-performing loans position in banks also indicates the wasteful nature of private sector investment spending. Meanwhile, there are growing concerns as to whether the toxic assets or NPL position on the banks' balance sheets can drive Iran's banking system to a financial collapse (AI Monitor 2018).

**Figure 19: Investment in Iran as a percentage of GDP, 2009-18**

Source: <https://www.ceicdata.com/en/indicator/iran/investment--nominal-gdp>

There are several reasons for the low investment spending in Iran; uncertain US policies, bureaucratic dispersal of loans both by banks and through NDF schemes, exchange rate fluctuations as well as high inflation expectations. However, the abysmal level of investment shows that Iran's growth story and its standard of living has been induced and supported by government spending (from its oil export earnings) rather than consistent productivity gains in industry.

**Figure 20: Capital formation in Iran in dollars, 2009-2017**

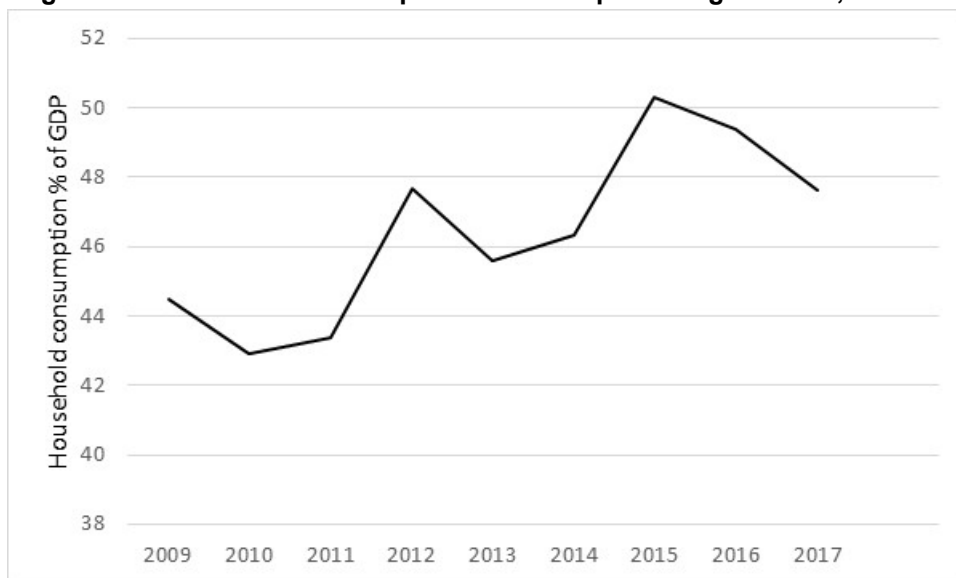
Source: [https://www.theglobaleconomy.com/Iran/capital\\_investment\\_dollars/](https://www.theglobaleconomy.com/Iran/capital_investment_dollars/)

On the savings side, anecdotal reports from Iran indicate the likely impact that sanctions can have on the savings rate and also the quantum of savings.

Our bank savings have been wiped out, rents go up every month, and the price of food increases every single day, while most salaries stay the same (Benjamin 2019).

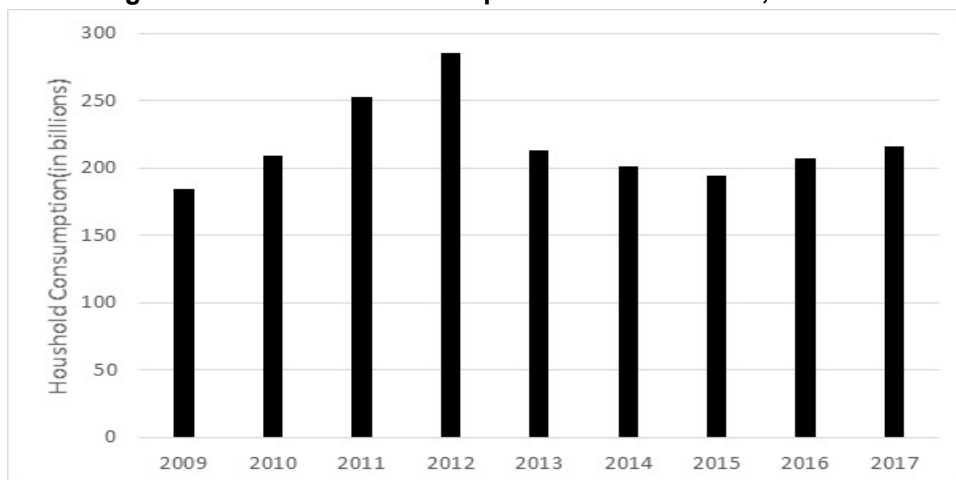
Under the present circumstances it is only obvious that people will cut down consumption and attempt to save a larger proportion of their incomes. Given the uncertainty over the duration and intensity of sanctions, households will expect the situation to deteriorate further so that saving for a rainy day is more a necessity than an option that can be deferred. With low returns on bank deposits that are way below the inflation rate, the preferred savings options of households are likely to be foreign currency and gold. Since accumulation of physical assets is not reflected in the savings rate of financial assets, the impact on consumption, and thereby on sales of businesses, could be even greater. Figure 21 and 22 tells us the story of household consumption in Iran; in particular the situation that arose during the period of sanctions between 2012 and 2015.

**Figure 21: Household consumption in Iran as percentage of GDP, 2009-17:**



Source: [https://www.theglobaleconomy.com/Iran/household\\_consumption/](https://www.theglobaleconomy.com/Iran/household_consumption/)

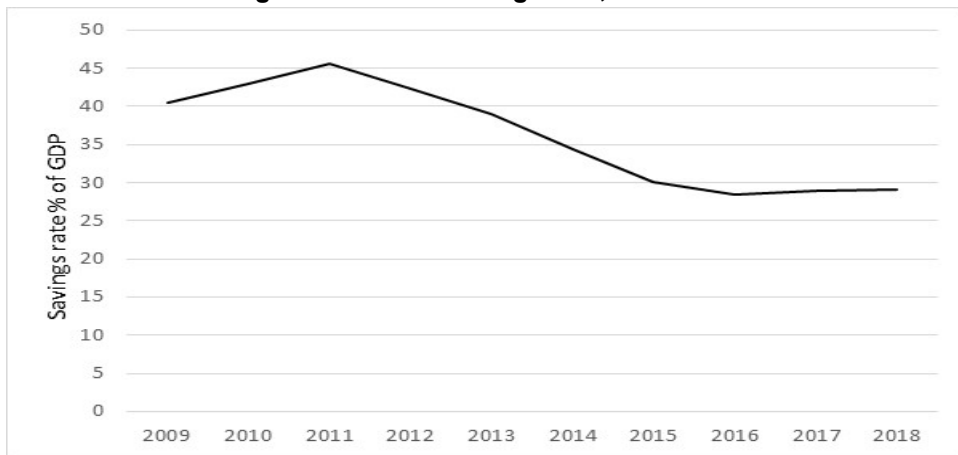
**Figure 22: Household consumption in Iran in dollars, 2009-17**



Source: [https://www.theglobaleconomy.com/Iran/household\\_consumption\\_dollars/](https://www.theglobaleconomy.com/Iran/household_consumption_dollars/)

While the consumption data above tells us what could be the desired savings rate of households, the actual savings rate ( $S/G \times 100$ ) shows a different trend; it broadly shows a declining trend, more so during a period of the 2012-15 sanctions. This is because the savings rate measures the quantum of savings to GDP so that with declining GDP (the denominator is decreasing), the quantum of savings (numerator) must be declining at a higher rate than the denominator. In other words, households were in fact increasing their desired savings rate (propensity to save) although at the end of the period they were left with a lower actual savings rate; a situation akin to the Keynesian “paradox of thrift” wherein a rising desire to save induces falling consumption, dragging the economy into a recession (contracting GDP), whereby households actually end up with a lower savings rate.

**Figure 23: Iran’s savings rate, 2009-2018**



Source: [http://www.economywatch.com/economic-statistics/Iran/Gross\\_National\\_Savings\\_Percentage\\_of\\_GDP/](http://www.economywatch.com/economic-statistics/Iran/Gross_National_Savings_Percentage_of_GDP/)

The private domestic sector’s net financial asset accumulation must now be seen in the light of the above; although  $S - I$  remains positive, both  $S$  and  $I$  are declining, induced by contractions in GDP, particularly during periods when sanctions are in force.

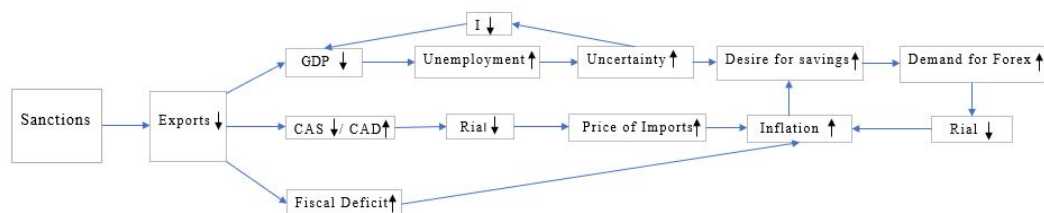
## **12. Summary and Conclusion**

Iran is imploding. And a critical analysis of macroeconomic parameters shows unequivocally that this is an outcome of US sanctions on Iran. Figure 24 schematically illustrates the impact of sanctions on the Iranian economy. The shock emanating from decreased exports is transmitted across all sectors of the economy in a perpetual vicious cycle that could drag Iran into an existential crisis.

While the SFB model is clearly inadequate in understanding the complexity of the sanctions on Iran, it is indispensable in highlighting the importance of sectoral stock-flow consistency for an economy. Returning to Figure 2, as Iran moves into a current account deficit zone, and uncertainties of the effects of sanctions permeate deeper through the economy, the desire for savings by the domestic private sector will only become greater. Without any possibility for exports to increase the desire for increased savings must be supported by larger fiscal deficits through increased public debt. But herein lies the

dilemma for Iran; deficit spending is likely to accelerate inflation further and simultaneously hammer the rial even harder.

**Figure 24: A schematic presentation of the transmission of the shock from export sanctions on Iran**



On the other hand, with larger deficits, an increased desire for savings will lead to a further contraction of the economy, causing even more unemployment, the internal repercussions of which could induce political instability. There seems to be no policy option available for Iran from this maze of dilemmas and self-fulfilling prophecies. In the longer run, Iran must focus on governance to build greater complexity into its economy – but this is neither within the scope of the paper nor within Iran's present options. For now, a return to the negotiating table with the US seems to be the only way out of a macroeconomic crisis for Iran.

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