RESEARCH ARTICLE   OPEN ACCESS

Forecasting the Iranian Currency Value Based on Inflation, Interest Rate, and Interbank Rate

Amirhossein Taghipour,

King Mongkut's Institute of Technology Ladkrabang, Thailand, amirtg149@gmail.com

Abstract

The aim of the analysis is to determine the impact of exchange rate changes on Iranian currency.According to economic theory, there is a negative relationship between interest rates and exchange rates. This formed the basis for this paper, which sought to determine if this holds true for Iran and whether interest rate policy does, in fact, contribute to exchange rate fluctuations. Additionally, the government spends this budget and generates purchasing power, and this purchasing power enters the market, where, if there are sufficient goods on the market, prices remain relatively stable; if there are insufficient goods, prices rise. As a result, the researcher concludes that not only is the currency's value depreciating by nearly 20 to 22 percent compounded annually, but also that other products are being impacted by this fluctuation in the inflation rate, which means that the prices of petroleum, gasoline for automobiles, and other consuming products are increasing by 19 to 22 percent, with average of 21 percent. This rate is impacted by a number of factors, including Iran's and other nations' regional and international political and economic actions, as well as the country's national and international level of corruption.Even after the sanctions are lifted, Iran's economy is still highly dependent on a variety of other factors, such as the banking system's structure.

Keywords:*Exchange Rate, Inflation Rate, Interbank Rate, Economy, Iran.*

Introduction

Exchange rate volatility can have a major impact on the general level of prices in emerging economies. Real exchange rate policies must be implemented in developed countries to account for domestic inflation. Iran's economy is chronically in crisis, and the country is experiencing high and chronic inflation.It also resulted in excessive exchange rate fluctuations and a weakening of exchange rates. One of the most important subjects for economists to research has always been the relationship between inflation and exchange rates. As a result, changes in the exchange rate have an effect on nominal wages through the impact of the national currency on the Consumer Price Index. There is a real balance channel in addition to the previously listed imported output and imported input cost channels. The last and most critical argument is that some of the external issues of the exchange rate are related to the national economy. The exchange rate plays an important role in monetary policy because it influences the amount of money spent on consumer goods, services, and even the number of people living in a country (Monfared, &Akın, 2017).Affection Since it is a contributing factor in macroeconomics, the rate should be controlled and adjusted as needed. Making policy Many factors influence the interest rate, including economic stability and monetary policy, etc., with the exchange rate being one of those macroeconomic variables (Samani& Ansari, 2017).

A central bank's inflation outlook is one of the instruments it uses to target inflation. The most serious flaw in previous forecasting models was their inability to estimate over time. However, central bank policymakers should disregard short-term and intermittent price shifts in order to create economic stability by forecasting constant inflation. As a result, it has been attempted to present nonlinear dynamic models for simulation of inflation in Iran's economy using the Temporary and Permanent Influential TVP-DMA and TVP-DMS models(Samani& Ansari, 2017). The DMS estimation model results showed that the input variables had changed over time, emphasizing the importance of using dynamic models in inflation modeling rather than constant input variables.

The results of the DMA estimation model indicated that the probability of currency in circulation growth, economic growth, growth in visual and non-visual deposits in modeling of inflation in the economy. According to the results, dynamic models are more effective in forecasting inflation in Iran; hence, MAFE and MSFE in different models of DMA, DMS that are entirely dynamic are higher than TVP-BMA, BMA, and TVP. The findings maintained that simple changes in variable coefficients in the TVP model would not result in inflation simulation, and the complex assumption of input variables to the model is a significant factor in increasing the accuracy of inflation modeling in Iran's economy. As previously stated, the studied variables involve eight time-series that were chosen based on domestic past studies that had the greatest effect on inflation. In future research, by adding more variables to the model, it may be possible to investigate the effects of a time variable in other variables assessing inflation in Iran's economy.

Figure 1. interest rate in Iran from 2000-2020.

SOURCE: TRADINGECONOMICS.COM | CENTRAL BANK OF IRAN
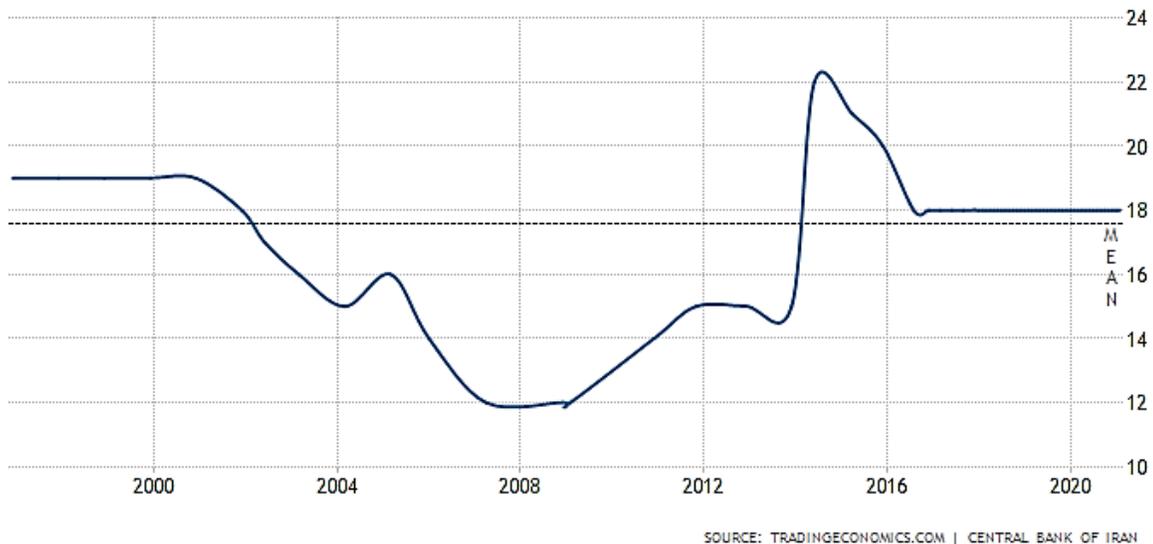
As illustrated in Figure 1, the average inflation rate in Iran over the last three decades has been approximately 18%, according to the Central Bank of Iran.These statistics, along with others,

indicate that inflation has fluctuated between approximately 18 and 22% over the last four decades.

Figure 2. annual inflation rate in Iran 2000-2020.

**Source:**tradingeconomics.com/Iran/inflation

Iran has experienced four presidents during the last two decades. Each president has tried to indicate a good performance of his government in controlling the inflation rate (shown in the red boxes in figure 2.). However, they have dragged the inflation rate down by force. For example, during the presidency of Mr. Muhammad Khatami between 2001-2003, as it is shown in figure 2., his government tried to pull down the rate to near 10 or lower than 10 percent. Following that, Mr. Mahmoud Ahmadinejad did the same between 2006 and 2007 and 2009 and 2011.Moreover, Mr. Hassan Rohani's government tried to manipulate the inflation rate as well during his first round and second round of the presidency. According to the Iranian Statistical Center (Iran Inflation Rate | 1957-2021 Data | 2022-2023 Forecast | Calendar | Historical, 2021), the annual inflation rate in Iran rose to 48.7 percent in March 2021, the highest since June 2019, from 48.2 percent the previous month, owing primarily to a faster increase in housing and utility prices (28.4 percent vs 27.1 percent). Inflation also increased for furniture and household appliances (68.3 percent vs 64.1 percent in February), clothing and footwear (52.1 percent vs 49.7 percent), restaurants & hotels (49.1 percent vs 43.3 percent), entertainment & culture (60.1 percent vs 59.5 percent), and health & medical services (60.1 percent vs 59.5 percent). (40.2 percent vs 37.8 percent). Meanwhile, rates for food and nonalcoholic drinks (67.0 percent vs 67.2 percent), transportation (54.0 percent vs 56.7 percent), miscellaneous products and services (47.8 percent vs 48.5 percent), communication (20.3 percent vs 21.8 percent), and tobacco continued to rise (51.7 percent vs 54.3 percent).

Figure 3. Central bank currency rate for import and export in Iran 2010-2020.

As shown in the figure 3., Iran has two currency rates, one of which is set aside for importers and exporters. The Central Bank of Iran is in charge of managing the flow of dollars into the country.The difference between market and central bank rates is usually large, and this gap allows market brokers to take advantage of the situation to maximize profit. Brokers, who can be either officials or locals, borrow money from the Central Bank in order to import or export the purchased goods. In exchange, the brokers either sell the dollars to the banks or sell them to the free market.

Figure 4. Free market currency rate in Iran 2010-2020.
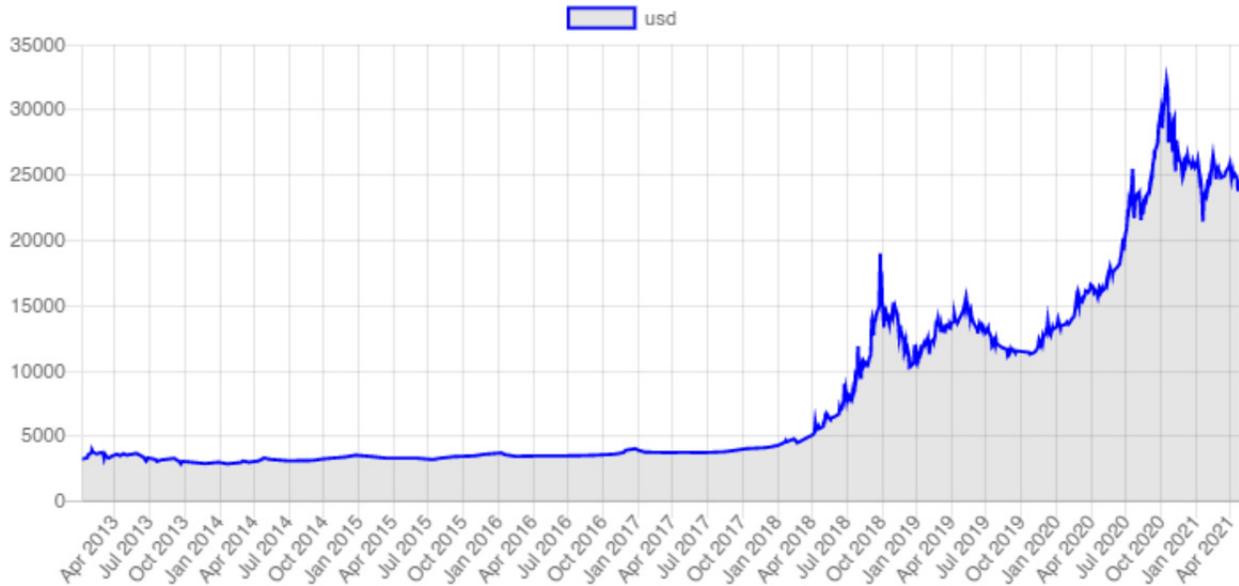
As shown in Figure 2, Mr. President Hasan Rouhani's government maintained a low inflation rate during his first term (2013–2017) and second term (2017–2018). This performance directly impacted an erroneous currency exchange rate. As a result, after 2018, the Iranian government took its finger off the deflationary button, resulting in a significant depreciation of the Iranian currency (Figure 4.).

The current interest rate on one-year long-term investment deposits is 15%, calculated at the interest rate. The monthly interest income is calculated using the formula below and is deposited monthly into the depositor's designated account. One month is the bare minimum required to start making money.
The following is the calculation method:

$$\text{Monthly Profit Interest} = \frac{\text{number of actual days per year}}{(\text{actual days per month; rate deposit amount})}$$

It is important to note that the profit calculated by the above formula is calculated on a monthly basis. The deposit will be made into the depositor's designated account. We will pay the difference between the paid-in profits and the eligible earnings from the customer or paid to the customer if an account is closed early.

Table 1. Interest rate in Iran's local banks

Bank name	Profit ceiling	Minimum investment	Failure rate
Ayande	18%	1,000,000	10% before one year
Ansar	15 percent	1,000,000	10% before one year
Pasargad	15 percent	1,000,000	8% before 3 months
Post Bank	15 percent	1,000,000	8% before one year
Business	15 percent	1,000,000	10% before one year
Cooperative development	15 percent	1,000,000	8% before one year
Export Development	15 percent	1,000,000	8% before one year
The wisdom of the Iranians	15 percent	1,000,000	8% before one year
Middle East	15 percent	1,000,000	8% before one year
Welfare of workers	15 percent	1,000,000	8% before one year
Saman	15 percent	1,000,000	8% before 3 months
Sina	18%	50,000,000	8% before 3 months
Shahr	15 percent	1,000,000	After a month without failure rate
Saderat	15 percent	1,000,000	8% before one year
Ghavamin	18%	1,000,000	10% before one year
Kowsar Institute	15 percent	1,000,000	No failure rate

According to Table 1, the average interest rate in Iran's local banks is nearly 15 percent. It means that if an Iranian citizen wants to earn interest on his or her money, they may get 15% on the present value of the deposited money. Similarly, the government adds up 10-20 percent on employees' salaries every year.Because of this, it is anticipated that there will be an inflation rate ranging from 15 to 20 percent each year.

Table 2.Interbank market rate

Date	Interbank market rate	Minimum repurchase agreement rate	Rule of validation of the rule	Regular deposit rates
22-Apr 2021	19.76%	19.80%	22%	14%
15-Apr 2021	19.82%	19.80%	22%	14%
8-Apr 2021	19.87%	19.80%	22%	14%
31-Mar 2021	19.90%	19.80%	22%	14%
18-Mar 2021	19.99%	19.80%	22%	14%
13-Mar 2021	19.72%	19.80%	22%	14%
6-Mar 2021	19.71%	19.81%	22%	14%
27-Feb 2021	19.81%	19.81%	22%	14%
20-Feb 2021	19.79%	19.81%	22%	14%
13-Feb 2021	19.85%	19.81%	22%	14%
Average	19.82%	19.804%	22%	14%

Source:https://www.cbi.ir/PolicyRates/policyrates_fa.aspx

According to the results in Table 2, the interbank market rate will be approximately 19.82 percent in 2021. Similarly, one of the ways banks make payments is through the establishment of numerous businesses throughout the country. For instance, banks should have a diverse range of industries and businesses in order to meet their obligations, whether to individuals or to other banks. In this scenario, the country's inflation rate is projected to be around 19.82 percent.Additionally, the researchers discovered a formula with the following specifications for forecasting changes in the currency rate in Iran:

The compound interest formula is used to calculate the future value of Iranian currency versus USA dollars:

$$A = P (1 + r/n)^{nt}$$

In the formula

A = Accrued amount (principal + interest)

P = Principal Amount

r = Annual nominal interest rate in decimal form

R = Annual nominal interest rate expressed as a percentage

r = R/100

n = the number of compounding periods per unit of time

t = time in decimal years;

I= is the amount of interest

ln = natural logarithm, as used in the formulas below

Figure 5. Free market currency rate calculated based on value of currency 1979-2002.

According to figure 5., the currency's principal rate is calculated using Iran's 1979 currency rate, which is valued at up to 7 toman (70 rials). According to inflation, interest, and interbank rates statistics, the average is estimated to be 21%. And 23 years later, from 1979 to 2002 (1357-1381 Iranian calendar years), the free-market exchange rate fluctuated between 7 and 799 Tomans (Figure 10.). While the formula and my calculations indicate that the currency value would be 561 Tomans.

Figure 6. Free market currency rate calculated based on value of currency 1979-2012.

According to Figure 6, the currency's principal rate is determined using Iran's 1979 currency rate, which is worth up to 7 toman (70 rials). According to inflation, interest, and interbank rate figures, the average is calculated to be 21%. And 33 years later, from 1979 to 2012 (1357-1391 Iranian calendar years), the free-market exchange rate fluctuated between 7 and 3650Tomans (Figure 10.). While the formula and my estimates show that the currency value is 3,775 Tomans.The difference between the real free market and my estimate is not very large, indicating that the formula may be accurate on some level.

Figure 7. Free market currency rate calculated based on value of currency 1979-2021.

The currency's principal rate is calculated using Iran's 1979 currency rate, which is worth up to 7 toman, as shown in Figure 7. (70 rials). The average is estimated to be 21% based on inflation, interest, and interbank rate estimates. The free-market exchange rate fluctuated between 7 and 24,615 Tomans (according to https://www.bonbast.com/historical, average iranian currecy rate in April 2021) for 43 years, from 1979 to 2021 (1357-1400 Iranian calendar years) (Figure 10.). The currency value, according to the formula and my calculations, is 25,402 Tomans. The difference between the actual free market and my estimation isn't significant, implying that the formula is correct to some extent.

Figure 8. Anticipating the Free-market currency rate between 1979-2025.

The currency value, according to the formula and my calculations, will be around 54,451 Tomansby2025 (1404 Iranian calendar years) (Figure 8.).

Figure 9. Anticipating the Free-market currency rate between 1979-2029.

The currency value, according to the formula and my calculations, will be around 116,721 Tomans by 2029 (1408 Iranian calendar years) (Figure 9.).

Figure 10. Free market currency rate 1979-2021.

نسب آزاد به رسمی	سال	حداکثر نرخ رسمی بانک مرکزی (ریال)	حداکثر نرخ بازار آزاد (ریال)	سال
143%	سال 1357	7	10	1357
200%	سال 1358	7	14	1358
286%	سال 1359	7	20	1359
338%	سال 1360	8	27	1360
438%	سال 1361	8	35	1361
563%	سال 1362	8	45	1362
644%	سال 1363	9	58	1363
763%	سال 1364	8	61	1364
1057%	سال 1365	7	74	1365
1414%	سال 1366	7	99	1366
1600%	سال 1367	6	96	1367
1714%	سال 1368	7	120	1368
2350%	سال 1369	6	141	1369
2367%	سال 1370	6	142	1370
103%	سال 1371	145	149	1371
109%	سال 1372	165	180	1372
150%	سال 1373	175	263	1373
230%	سال 1374	175	403	1374
254%	سال 1375	175	444	1375
273%	سال 1376	175	478	1376
369%	سال 1377	175	646	1377
493%	سال 1378	175	863	1378
465%	سال 1379	175	813	1379
453%	سال 1380	175	792	1380
101%	سال 1381	795	799	1381
100%	سال 1382	828	832	1382
100%	سال 1383	871	874	1383
100%	سال 1384	902	904	1384
100%	سال 1385	919	922	1385
101%	سال 1386	928	935	1386
101%	سال 1387	957	966	1387
102%	سال 1388	983	1000	1388
106%	سال 1389	1036	1100	1389
164%	سال 1390	1100	1800	1390
298%	سال 1391	1226 و ارز مبادله ای	3650	1391
294%	سال 1392	1226 و ارز مبادله ای	3600	1392
119%	سال 1393	2400 تا 2990	3550	1393
113%	سال 1394	3000 تا 3180	3600	1394
114%	سال 1395	3022 تا 3280	3750	1395
119%	سال 1396	3243 تا 3585	4250	1396
361%	سال 1397	4200 و ارز سنا	15150	1397

www.ModiriateFarda.ir

Managerial implication

As a result, the government must 1) restructure the government budget, 2) restructure bank credit, loan, interbank rate, interest rate and 3) restructure the import-export structure and dollar allocation policies for imports and exports. Apart from the calculations and estimations contained in this paper, the solution for such an economy is to gradually reduce the interest rate to a level comparable to that of other well-managed banking systems.

Conclusion

The inflation rate has a strong direct impact on the Iranian currency. So, the researcher concludes that not only is the value of the currency depreciating by nearly 20 to 22 percent compounded annually; but also, other products are also being affected by this inflation rate fluctuation, which means that the prices of petroleum, gas for cars, and other consuming products are being raised annually by 19 to 22 percent, with an average of 21 percent. This anticipatory rate is influenced by a variety of factors, including Iran's and other nations' regional and international political and economic actions, the country's national and international level of corruption, and so on.Although the government is attempting to keep the inflation rate low for a few years, the country's inflation rate will inevitably rise after a few years. As a result, the currency's value will depreciate accordingly.

References

http://rasanebank.com/%D9%84%DB%8C%D8%B3%D8%AA-
%DA%A9%D8%A7%D9%85%D9%84-%D9%86%D8%B1%D8%AE-
%D8%B3%D9%88%D8%AF-%D8%A8%D8%A7%D9%86%DA%A9-
%D8%A8%DB%8C%D8%B4%D8%AA%D8%B1%DB%8C%D9%86/

https://ba24.ir/service/detail/20percent/99/view/

https://ba24.ir/service/detail/long-term-deposit/79/view/

https://ba24.ir/service/detail/short-term-deposit/80/view/

https://www.cbi.ir/PolicyRates/policyrates_fa.aspx

https://www.iafi.ir/

https://www.rade.ir/6845-%D8%A8%DB%8C%D8%B4%D8%AA%D8%B1%DB%8C%D9%86-
%D8%B3%D9%88%D8%AF-%D8%B3%D9%BE%D8%B1%D8%AF%D9%87-
%D8%A8%D8%A7%D9%86%DA%A9%E2%80%8C%D9%87%D8%A7-
%D8%AF%D8%B1-%D8%B3%D8%A7%D9%84-98/

https://www.rade.ir/service_cat/%d8%b3%d9%be%d8%b1%d8%af%d9%87-
%d8%a8%d9%84%d9%86%d8%af%d9%85%d8%af%d8%aa-
%db%8c%da%a9%d8%b3%d8%a7%d9%84%d9%87/

Monfared, S. S., &Akın, F. (2017). The relationship between exchange rates and inflation: The case of iran. European Journal of Sustainable Development, 6(4), 329-329.

Samani, H. A., & Ansari, M. S. (2017). Investigating the relationship between interest rate and exchange rate: Application to a VAR model. In Conference Paper (pp. 1-12).

Tradingeconomics.com. 2021. Iran Inflation Rate | 1957-2021 Data | 2022-2023 Forecast | Calendar | Historical. [online] Available at: <https://tradingeconomics.com/iran/inflation-cpi> [Accessed 21 May 2021].