



The Stock Market, Consumption, and Inflation: Empirical Evidence of Iran

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Abstract

The Iranian stock market has recently fluctuated sharply; at constant prices, it increased 7.3 times from March 2019 to August 2020 but decreased to less than half the following year. The inflation rate also increased sharply. So, the question arose as to whether the stock market value, as a wealth, through an indirect channel of consumption (wealth), is one of the factors increasing inflation. This study used a structural equation model to investigate this issue using monthly data from 2016 to 2021 by studying two equations of consumption and inflation. Results show that although the stock market value is not one factor that affects consumption, GDP growth and housing, as well as wealth, are significant factors in consumption. Therefore, the stock market value through the indirect channel does not lead to inflation. In addition, the stock market value does not affect inflation directly. But Money growth and Exchange rate are the most crucial factors affecting inflation, and GDP growth has slowed inflation in Iran.

Keywords: Exchange Rate, Inflation, Money, Stock Market, Wealth.

JEL Classification: E21, E31, E51.

1. Introduction

There is a divergence of opinion about the relationship between inflation and the stock market. Some believe there is a negative relationship between inflation and the stock market (Fama, 1981). Some theories argue that the stock market protects against inflation well (Fisher, 1930). Although the inflation effect on the stock market has been analyzed in several studies, less attention has been paid to the impact of increasing stock market value on macroeconomic variables like inflation.

In recent years, inflation has become a significant problem in Iran. There are different views on the causes of inflation in Iran's liquidity, exchange rate, government budget deficit, expectations, and imported inflation (Sadeghi et al., 2010; Azimi et al., 2013; Pourkazemi et al., 2016). Given Iran's rising inflation and stock market fluctuations, finding a relationship between these variables has received much attention. Moreover, in recent years, the share of stock assets in the income of Iranian households has increased. In addition, the number of shareholders has increased in recent years, so 60% of the population of Iran in 2020 received a stock exchange code (Securities & Exchange Organization).

On the other hand, many vital stocks (such as petrochemicals, automobiles, and metals) that play an essential role in the stock market index are state-owned. The growth of stock wealth in the income of Iranian households and the intervention of the Iranian government in the price of large corporation stocks are very noticeable. So, one of the debates is whether the increase in the stock market's value has a role in intensifying Iran's inflation. On the one hand, it has been raised that the growth of the stock market value from the wealth channel can be one of the reasons for inflation because, with the increase in wealth, consumption increases, which increases the demand, leading to inflation. On the other hand, Iran's stock market grows under political decisions, not real ones. Therefore, decisions affecting the growth of the stock market may cause inflation. Nevertheless, any country's stock market is one of that country's development factors. Therefore, this study seeks to answer whether the increase in the value of the stock market is involved in the occurrence of inflation or not.

The stock market has many ways of influencing inflation. Because of Pigou's wealth effect, rising household income and purchasing power increase the consumption level. This study focuses on the impact of the stock market on inflation through the consumption channel, although it is also examined for further analysis of the liquidity channel. Also, this study contributes to the Literature in several ways: I) Despite the central importance of the above issues, a comprehensive survey of the effect of changes in stock market value on inflation through consumption has not been conducted. Therefore, to our knowledge, this study examines for the first time the effect of increased stock market value on inflation through the wealth (consumption) channel; II) Since no comprehensive research has been conducted, there is no clear theoretical basis for this relationship. As such, this study collects and extracts the theoretical framework of this study of theories and parallel studies; III) Applying the structural equation model to examine the effect of the stock market on inflation

through consumption provides exciting results. Therefore, this study uses the structural equation model to investigate the impact of stock market value on inflation from the consumption channel in Iran.

In the next section of the article, the Literature is reviewed. In the third section, data and methodology will be introduced. The empirical results are shown in the fourth section, the fifth section reports further analysis, and finally, conclusions and policy recommendations are presented in the sixth section.

2. Literature review

We first look at theories about the impact of stock values on consumption. As there are no studies to consider the direct effect of stock value on inflation, we relied on the theories on the relationship between stock market value and consumption and the relationship between consumption and inflation. So, we extracted a channel of stock market impact on inflation via the consumption channel.

2.1 Stock Value and Consumption

The consumption function indicates the relation between consumption and various factors affecting it. There are several theories about consumption. In 1936, Keynes argued that multiple factors affect consumption, but income is the most significant factor influencing consumption. Keynes's ideas contradicted the classical theories, which argued that rising interest rates would reduce consumption. Duesenberry (1949) claimed that people resist the reduction of consumption after getting used to a level of consumption and that current consumption depends on past income in addition to current income. Ando & Modigliani (1963) proposed a lifecycle model. They divided an individual's life into youth, middle age, and old age. Under the life cycle model, real consumption depends on income from work, household net wealth. So, if wealth rises unexpectedly, households will save less and consume more over their lifetime. Friedman (1957) proposed the theory of permanent income.

According to Friedman's theory, consumption is obtained by optimization between individual utility periods. Friedman believed consumption was dependent on permanent income. He divided income into two groups: permanent and temporary income, and implicitly included wealth in the consumption function. Therefore, in life cycle theories explicitly and in permanent income theory, wealth is also included as one factor determining the consumption level. However, wealth as a factor influencing consumption was first proposed by

Pigou in 1943. Pigou argued that falling prices increase real wealth (people's purchasing power), increasing consumption. The effect of increased consumption due to increased purchasing power is called the Wealth or Pigou Effect. Some empirical studies have also studied the impact of wealth on the consumption function (Jensen and Johannesen, 2017; Zhang et al., 2021; Aiello et al., 2023). Peltonen et al. (2012) analyzed housing prices (as financial wealth) and stock prices (as liquidity wealth) to examine the effect of wealth on consumption. Ciarlone (2011) examined the impact of income changes, real wealth, and financial wealth on private consumption. He considered housing prices for real wealth and stock market prices for financial wealth.

Given that today, the share of stock assets in the wealth of Iranian households has increased, stock wealth as one of the sources of income can affect household consumption expenditures. In addition, as the share of stock assets in household income has increased, household consumption is sensitive to changes in the stock market (Azizi, 2009; Mankiw and Zeldes, 1991). The stock market affects consumption through both direct and indirect channels. Some studies have examined the direct effect of the stock market on consumption (Poterba, 2000; Jensen and Johannesen, 2017; Di-Maggio et al., 2018; Zhang et al., 2021). Rising the stock market's value means increasing shareholders' wealth, which increases the wealth directly and leads to increased consumer spending (Dynan and Maki, 2001). Some studies have also considered the indirect effect of the stock market on consumer sentiment (Ludwig and Slok, 2002). Increasing the stock market's value improves the future income of shareholders (households), which in the future and with delays increases the consumption expenditures through the indirect channel. Rising stock prices increase the value of collateral, which helps financially constrained households obtain easy consumer loans. So, household consumption increases (Simo-Kengne et al., 2015). Stock market fluctuations through indirect channels change long-run consumption by about 76%, affecting the household's psychology, expectations, ability, and financial budget (Ampudia and Ehrmann, 2017). However, some studies also argue that the indirect effects of wealth are not fundamental determinants of consumption expenditure (Dynan and Maki, 2001). Zhang et al. (2021) showed that a drop in the stock market index reduces household consumption by around 3%, from the direct channel of the effect of wealth and the indirect channel of pessimistic expectations and limited ability to finance. Cieslak and Vissing-Jørgensen (2021) indicated that stock market fluctuations cause fluctuations in household wealth and income. Cooper and Dynan (2016) also demonstrated that stock market fluctuations

change aggregate demand from the investment channel. Chodorow-Reich et al. (2021) stated that a dollar increase in stock market wealth would increase consumer spending by 3.2 cents. Some studies have found a higher percentage (Di-Maggio et al., 2020), claiming that a dollar increase in stock market value increases consumption by 5 to 15 cents per year. In different countries, the effect of wealth on consumption shows different percentages. A dollar increase in wealth in Japan increases consumption by about one percent (Mutoh et al., 1993). In Italy, a dollar increase in revenue changes consumption by about 3 to 3.5 percent (Rossi and Visco, 1995). Some studies have argued that increases in consumption occur gradually and over time as wealth increases (Brayton and Tinsley, 1996). Some surveys have also found no significant relationship between stock market wealth and consumption (Zhou and Carroll, 2012). Some researchers have also discussed the two-way relationship between household consumption and the stock market (Liu and Shu, 2004; Hui et al., 2012). Di-Maggio et al. (2018) investigated the effect of stock wealth on the consumption of Swedish households and discovered the heterogeneous behavior of stock wealth on consumption in different income deciles. Liu and Li (2023) investigated how habits are formed on the consumption of households in youth and old age and found that reducing current consumption by reducing the habit stock will increase future wealth. They argued that the consumption function in habit formation changes over time. Arellano (2023) investigated the effect of income shocks on US household consumption using a nonlinear quantile approach with annual data from 2005 to 2017 and found significant heterogeneity in consumer responses to income shocks. Aiello et al. (2023) investigated the effect of digital currency wealth on households' consumption and found that the MPC digital currency profits are twice the MPC stock dividends. In addition, they found that digital currency wealth affects the real economy through the consumption channel. According to the various theories and studies mentioned above, the consumption function in this study in the benchmark model is as follows:

$$C = f(VM, GDP, PH) \quad (1)$$

In Equation 1, C is real private consumption, VM is the real stock market value (financial wealth), GDP is real GDP, and PH is housing price (real wealth).

2.2 Stock Value and Inflation

The relationship between consumption and inflation to the theory of inflation due to demand pressure, can be explained among the various theories of inflation.

Keynes's theory of inflation from the point of demand pressure considers the emergence of inflation as the reason for the increase in aggregate demand. The rise in demand may be due to the increase in the real and monetary sectors of the economy. In the real sector, factors such as an increase in consumer spending, investment spending, and exports, and a decline in imports can increase aggregate demand or, in other words, push the aggregate demand curve upward. However, the increase in demand may be due to monetary factors. Increasing the money supply due to expansionary monetary policy increases aggregate demand and the general level of prices (Pourkazemi et al., 2016). Keynes argues that an increase in effective demand leads to an increase in real output as long as there are unemployed factors of production. Still, when labor and capital equipment are relatively fully employed, a further increase in demand can lead to higher prices. Keynes calls this net inflation (Pourkazemi et al., 2016; Azimi et al., 2013). In addition, as a society's inflation expectations increase, consumption and aggregate demand increase, leading to higher inflation (Coibion et al., 2023). According to the various theories, the factors affecting inflation in the benchmark model of this study are as follows:

$$P = f(C, E, M2, IR) \quad (2)$$

In Equation 2, P is inflation, C represents real private consumption, E indicates the exchange rate, $M2$ shows liquidity, and IR is the interbank interest rate.

Inflation is one of the most important economic problems that some researchers believe is affected by stock prices (Gupta and Inglesi-Lotz, 2012). In addition, the real stock price through the wealth (consumption) channel can affect aggregate demand and inflation (Antonakakis et al., 2017).

This research examines the effect of stock market value on inflation through the consumption channel and answers whether the increase in the value of the Iranian stock market has contributed to the intensification of inflation. There is a possibility that household wealth and income changes will directly lead to changes in household consumption, affecting the consumer price index. Wealth directly and rapidly affects consumption; consumption increases in the coming periods as wealth increases. (Dynan and Maki, 2001). The dramatic rise in inflation in Iran in recent years has sparked much debate as to whether an increase in the value of the stock market index through the "Wealth Effects" channel could lead to inflation with a boom in consumer spending. In addition to the wealth effect, some researchers discuss another channel for the stock market

to influence inflation. For this purpose, approaches with mediator variables are used. The SEM approach can properly show the direct and indirect effects of the independent variable (stock market value) through the mediating variable (consumption) on the dependent variable (inflation) and answer the question of whether the stock market can lead directly or indirectly through the consumption channel. Some researchers argue that sometimes, the stock market can play a role in liquidity and thus raise inflation. So, in this study, the effect of stock market value on inflation is also investigated through the liquidity channel for further analysis. According to the existing study gap, this study examines the direct and indirect effects of the stock market on inflation. In addition, despite the severe and stable inflation in Iran, the fluctuations of stock returns and the rapid increase in the number of shareholders in recent years, the results of this study can help policymakers in order to control inflation and developing the stock market for economic growth. Despite this importance, there is relatively little empirical evidence on the effects of the stock market on inflation. Therefore, this study is one of the first attempts to test the impact of increasing stock market value on inflation from the consumption channel.

3. Data and Method

3.1 Trends

This subsection discusses trends in the Iranian stock market and inflation from September 2016 to September 2021. The value of the Iranian stock market has been increasing in recent years. The value of the Iranian stock market (the total value of the stock exchanges in the Tehran Stock Exchange and OTC) at the current price has increased from about 4259240 billion Rials in 2016 to about 67593993 billion Rials in 2021. In addition, the Iranian economy has constantly been exposed to high inflation rates in recent years. It has been rising since 2017, and annual inflation in 2020 has reached about 48.7% (Securities & Exchange Organization; Central Bank of Iran).

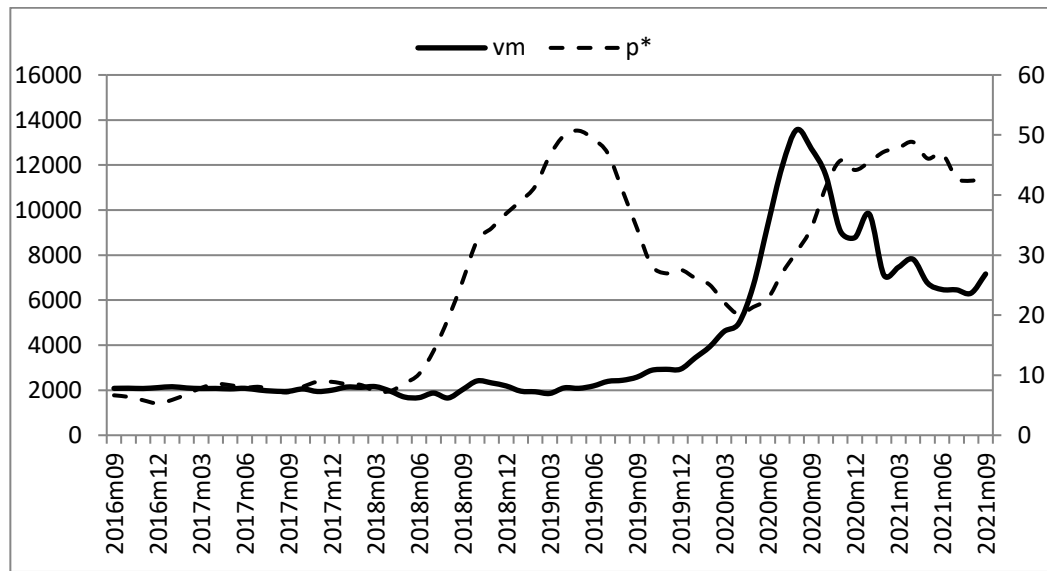


Figure 1. The Trends of the Iranian Stock Market Value at a Fixed Price in Thousand Billion Rial (Solid Line on the Left) and Annual Inflation in Percent (Dashed Line on the Right)

Source: Research finding.

Figure 1 shows that the real value of the Iran Stock Exchange had an upward trend during the study period. The slope of this value has been mild from 2016m9 to 2019m12, and from 2019m12 had an upward trend to 2020m8. It experienced a sharp fall from 2020m8 to 2020m12 and fluctuated greatly until 2021m9. In addition, annual inflation had an upward trend. The chart indicates that inflation has been growing steadily from 2018m3 to 2019m4. From 2019m4 to 2020m4 has taken a downward trend. Inflation has risen again from 2020m4 to 2020m11. After a slight decrease, it increased again to 2021m4 and has seen many fluctuations since 2021m4. Generally, the two variables show the same pattern in some periods. Nevertheless, it is noteworthy that inflation has continued to rise since 2020m8, when the value of the Iranian stock market fell sharply.

3.2 Data

This study's period is considered monthly from September 2016 to September 2021. The variables used in this study and their source are presented in Table 1. Consumption and GDP data are available quarterly. Monthly data for these two variables were obtained from the Denton method. Denton's method interpolates a

time series (such as a season) and applies the constraints that the interpolated series follows (Bloem et al., 2001).

Table 1. Variable Acronyms, Definitions, and Sources

Abbreviation	Variables	Sources
VM	The market value of the stock market (Sum of stock and OTC values) (constant with GDP deflator)), Billion Rial	Securities & Exchange Organization (SEO)
GDP	Gross domestic product (constant= 2012), Billion Rial	Statistical Center of Iran
HP	The average purchase and sale price of one square meter of residential infrastructure, Rial	Statistical Center of Iran
C	Consumption (Private sector final consumption costs) (constant=2012)	Statistical Center of Iran
M2	Liquidity	Central Bank of Iran (CBI)
E	exchange rate (unofficial)	Central Bank of Iran (CBI)
IR	Interbank interest rates (%)	Central Bank of Iran (CBI)
CPI	Consumer price index (the base year 2016)	Statistical Center of Iran
P	Inflation	calculated based on CPI

Source: Research finding.

3.3 Method

Mediation is a causal relationship between several variables so that the first variable (X) affects the second variable (M), and the second variable affects the third variable (Y). The variable that depends on all or part of the effect of the independent variable on the dependent variable is called the mediating variable(M) (Baron and Kenny, 1986).

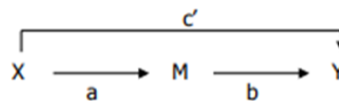


Figure 2. Relationships between the First and Third Variables and the Mediator Variable

Source: Baron and Kenny (1986).

Figure 2 shows path a, the effect of the first variable (stock market value) on the second variable (consumption), and path b, the effect of the second variable (consumption) on the third variable (inflation). These two paths are

called direct effects. The path c' where the relationship between the first variable (stock market value) and the third variable (inflation) is shown by the second variable (consumption or mediation), is called the indirect effect (Kenny et al., 2020).

Several approaches have been proposed to calculate the indirect effect. Most of these new approaches achieve the same values for the indirect effect. Statistical tests should be analyzed for significance and standard error to estimate the extent of the indirect effect. Structural Equation Modeling (SEM) is one of the most potent analysis methods in models with mediator variables. This model is a mathematical and statistical combination of several regressions that came together in a system to analyze complex phenomena. Therefore, this approach is very suitable for testing complex relationships between variables and has been used in various studies of different sciences (Teo, 2011; Adelson, 2012).

The SEM approach has several advantages. In addition to examining the paths defined in the model, the SEM approach makes it possible to estimate more complex models. Another advantage of the SEM approach is that it provides helpful information about model compatibility with data. In addition, unlike linear multiple regression models, SEM can calculate measurement error (Hoyle, 2012).

In the SEM approach, first, based on the hypotheses and study questions, a general outline of the relationships between the variables is drawn (Adelson, 2012). This study uses the approach (SEM) to estimate the effect of stock market value on inflation with the consumption mediating variable.

There are several methods to evaluate the fitting of the model (Hoyle, 2012). Model fitness tests are called fitness indices. These indicators are constantly developing and evolving (Alavi, 2013). Different studies evaluate different indicators. Normalized fitness index (NFI) and Tucker-Louise index (TLI) or non-normalized fitness index (NNFI) are among the model fitness indices in which values above 0.9 to 0.95 mean a good fit (Iacobucci, 2010). The fit index (GFI) with a coefficient less than 0.9 indicates poor fit. In addition, the Root Mean Square Error of Approximation index (RMSEA) is also one of the fitness indices of the model, and values less than 0.08 are acceptable. However, some studies have reported values less than 0.1 as acceptable. Values below the 0.08 index (SRMR) also indicate a good fit (Dion, 2008; Alavi, 2013).

4. Empirical Results

Recently, the increase in stock market value and the upward inflation growth in Iran have raised several questions about the relationship between these two variables. Therefore, this study with monthly data has studied the relationship between these two variables of the consumption channel with the SEM approach. The SEM approach has several estimation methods. One of the methods for estimating the sem approach is the Maximum Likelihood (ML) method, which has been used in several studies (Kline, 2011). This method shows the extent to which the observed variances and covariances between the variables can be reconstructed with the specified model, also known as a good fit evaluation (Brown, 2006). In this study, the maximum likelihood method has been used. Since the technique is based on assumptions, such as the normal distribution of variables, some pre-tests should be considered before estimating the model (Harrington, 2009). Thus, the normality of the variables is checked first. The Shapiro-Wilk and the Shapiro-France tests are used to check the normality of the data (Royston, 1992). The result shows that the probability values of the Shapiro-Wilk and Shapiro-France tests for all variables are higher than 0.05. Therefore, the normality of the distribution of the variables is accepted.

After examining the normality test of variables, the unit root test checks the variables' significance. For this purpose, the generalized Dickey-Fuller (1979) test is used. The results of the Augmented Dickey-Fuller test are shown in Table 2. The results show that the variables are nonstationary at the level, but with the first-order difference, the variables remain the same. The unit root test results when variables are in the natural logarithms indicate that all variables are stationary.

Table 2. Augmented Dickey-Fuller Test of Unit Root

Variables	Dickey-Fuller test	Variables	Dickey-Fuller test
VM	-0.946	LVM	-3.612
GDP	-2.097	LGDP	-4.107
HP	-0.504	LHP	-3.112
C	-2.540	LC	-4.589
M2	0.720	LM2	-2.990
E	-2.407	LE	-3.045
IR	-2.295	LIR	-3.501
CPI	1.125	LCPI	-2.611

Source: Research finding.

Note: Critical values (-3.566, -2.922, -2.596) at the level (1%, 5%, 10%), respectively. "L" variables in the natural logarithms.

The Breush-Pagan heteroscedasticity test is performed in the next step to check the heterogeneity. In this test, the null hypothesis indicates equal variances in the model. The results of this test showed that there is no variance heterogeneity problem in the estimated model.

The Breusch-Godfrey LM test examined the variables' autocorrelation. In this test, the null hypothesis is that there is no autocorrelation. The results of the autocorrelation test show that the null hypothesis is not accepted. Then, Toda and Yamamoto's (1995) causality tests are analyzed to examine the direction of causality. It is necessary to examine the long-run relationship and cointegration test between the variables to perform a conventional Granger causality test; in contrast, in the Toda-Yamamoto causality test, information about the cointegration properties of the system is not necessary. The Toda and Yamamoto Causality test results are presented in Table 3. The results indicate that there is a one-way relationship from VM to C. In addition, the results in this table show that VM is not the cause of CPI.

Table 3. Toda and Yamamoto No-Causality Test VAR Model Results

Excluded	Chi-sq	Prob.	Direction of causality
Dependent variable: LVM LC	1.612	0.446	$C \neq VM$
Dependent variable: LC LVM	11.89	0.0001	$VM \longrightarrow C$
Dependent variable: LCPI LVM	6.181	0.045	$VM \neq CPI$
Dependent variable: LVM LCPI	2.783	0.248	$CPI \neq VM$

Source: Research finding.

Table 4. Results of Model Estimation by ML Method with Total Sample Data

Structural	Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
LC	LVM	-0.0407***	-0.0407***	-0.0407***	-0.0407***	-0.0407***	-0.0407***	-0.037***
	LGDP	0.972***	0.972***	0.972***	0.972***	0.972***	0.972***	0.836***
	LHP	0.073***	0.073***	0.073***	0.073***	0.073***	0.073***	-0.086*
	LM2	--	--	--	--	--	--	0.300***
	CONS	-0.528	-0.528	-0.528	-0.528	-0.528	-0.528	0.089
LCPI	LC	-0.570***	-0.331**	-0.297**	-0.376***	2.554***	0.365	-0.570***
	LM2	1.117***	1.112***	1.092***	1.050***			1.117***
	LE	-0.207***	-0.291***	-0.273***	--	1.47***	2.59***	-0.207***
	LIR	0.170***	0.183***	0.197***	0.173***	0.109	-0.200	0.170***
	LVM	--	-0.009	--	--	--	--	--
	LGDP	--	-0.456**	-0.480**	-0.238	-0.417***	--	--
	CONS	3.531**	7.90***	7.60***	2.792	14.521	-26.74***	3.531**
	N	61	61	61	61	61	61	61
	CD	0.996	0.997	0.997	0.996	0.861	0.823	0.997

Source: Research finding.

Note: ***, **, * denote statistically significant at the 1%, 5%, 10%, level, respectively; “L” denotes variables in natural logarithms.

Table 5. Results of the Goodness of Fit Tests

Fit Statistic	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Optimal values
RMSEA	0.077	0.080	0.079	0.080	0.81	0.085	0.079	0.08>
GFI	0.989	0.998	0.996	0.994	0.992	0.990	0.996	0.9<
CFI	0.990	0.999	0.997	0.995	0.994	0.992	0.999	0.9<
TLI (NNFI)	0.933	0.922	0.900	0.939	0.993	0.889	0.899	0.9<
SRMR	0.035	0.035	0.035	0.040	0.06	0.07	0.024	0.08>
CD	0.996	0.997	0.997	0.996	0.861	0.823	0.997	R ²
N	61	61	61	61	61	61	61	-

Source: Research finding.

After reviewing the pre-tests, the relationships drawn in Equations 1 and 2, and Figure 2 are estimated using the SEM approach. These relationships are first estimated in the form of the benchmark model (1),¹ and then, for further analysis of the results, models (2)², (3)³, (4)⁴, (5)⁵, and (6)⁶ are also estimated. Model (7)⁷ is presented by changing the variables of the first part.

According to Table 4, it is observed that the coefficients of the first part of models 1 to 6 are similar because the variables of the first part of these models (i.e., the variables affecting consumption) are considered the same in all six models, so the coefficients are the same. In model 7, the variables of the first part (factors affecting consumption) are different from the six previous models, so the coefficients are different.

The empirical results of models 1 to 6 are similar in terms of factors affecting consumption and show that the real value of the stock market (VM) has a negative and significant effect on consumption. Then, by increasing the VM by one percent, 0.0407 percent of real consumption decreases. The impact of VM on household consumption in model 7 is also negative and statistically significant. Household income is the sum of savings and consumption; rising stock market value has led to a redistribution of the household income mix. As stock market value increases, households save more and consume less to take advantage of stock market speculation conditions. In addition, the more pessimistic consumers are, the more pessimistic they are about the future state of the economy (Zaremba et al., 2020). Therefore, due to the poor economic situation in Iran, due to international sanctions, despite the increase in the value of the stock market, Iranian households, due to a pessimistic view of the economic situation, refrain from increasing consumption and save to increase financial wealth so that they can deal with financial problems if bad economic conditions continue. Therefore, increasing market value through indirect consumption channels can not exacerbate inflation in Iran. Some studies have found that stock market fluctuations change aggregate demand from the investment channel (Copper and Dynan, 2016). Some studies, such as Zhang et al. (2021), have also found that the stock market directly correlates with consumption during a downturn.

¹. Model (1): $C = f(VM, GDP, HP)$, $CPI = f(C, M2, E, IR)$

². Model (2): $C = f(VM, GDP, HP)$, $CPI = f(C, M2, E, IR, VM, GDP)$

³. Model (3): $C = f(VM, GDP, HP)$, $CPI = f(C, M2, E, IR, GDP)$

⁴. Model (4): $C = f(VM, GDP, HP)$, $CPI = f(C, M2, IR, GDP)$

⁵. Model (5): $C = f(VM, GDP, HP)$, $CPI = f(C, E, IR, GDP)$

⁶. Model (6): $C = f(VM, GDP, HP)$, $CPI = f(C, E, IR)$

⁷. Model (7): $C = f(VM, GDP, HP, M2)$, $CPI = f(C, M2, E, IR)$

Real GDP has a positive and statistically significant effect on consumption in models 1 to 7. In fact, with a one percent increase in GDP, real consumption increases by about 0.972 percent. Batrancea (2021) studied the effect of GDP on household consumption with monthly data from 28 countries of the European Union from December 2019 to October 2020 and found that economic growth has a positive and significant effect on household consumption.

Housing price (HP) has a positive and significant effect on private sector consumption in models 1 to 6. In model 7, the impact of HP on C is significant at 10%. Housing in Iran is the main component of the wealth of the household. Therefore, with the increase in housing prices, household consumption increases through the wealth channel. Xu et al. (2018) also found a positive relationship between housing prices and consumption. However, some studies have also found that housing prices rise, household savings increase, and consumption decreases (Waxman et al., 2020).

In models 1 to 6, variables affecting consumption are considered constant, and the coefficients of the six models in the consumption function are the same. However, in model 7, the effect of liquidity on consumption is also analyzed. The results show that the impact of M2 on C is positive and statistically significant. It can be said that with a one percent increase in liquidity, consumption increases about 0.30 percent. In a study for Saudi Arabia, Algaeed (2016) found that household consumption increased as liquidity increased as wealth increased. Orphanides and Solow (1990) also argued that different rates of liquidity growth occur with varying inflation rates.

Real private sector consumption (C) reduces CPI on all models except Model 5. Because consumption is part of GDP, CPI decreases as consumption increases as a component of income. In addition, the effect of consumption on CPI in this period in Iran is more than the total income channel (total income, which is the sum of savings and consumption) than the total demand channel. In addition, by introducing real GDP into the model, the impact of consumption on inflation is diminished (see Model 2, Model 3, and Model 5 in Table 8).

Liquidity (M2) increases CPI in all models. Therefore, Friedman's theory of inflation in Iran is correct, and liquidity growth is the most critical factor in causing inflation in Iran. With a one percent increase in liquidity growth, inflation increases by about 1.117 percent. Therefore, the findings of this study show that although inflation in Iran is not just a monetary phenomenon and other factors have had a positive effect on its formation, the growth of liquidity has had the highest share in the formation of inflation (Model Results 1). The results of

other models show that inflation increases by more than one percent with a one percent increase in liquidity growth. Some studies support our results (Sadeghi et al., 2010; Shah et al., 2014).

An exchange rate (E) increase significantly and negatively affects the CPI in the presence of liquidity. By removing liquidity from the model, the impact of exchange rates on CPI becomes positive and significant (see results in Models 5 and 6). Models 5 and 6 show that with an increase of one percent in the exchange rate, inflation increases by more than one percent. In fact, with the rise in the exchange rate, imported raw materials become more expensive, which leads to an increase in the cost of items whose raw materials are imported, and causes prices to rise.

In most models, the Interbank interest rate (IR) positively and significantly impacts CPI. In model (1), with an increase of one percent interest rate, inflation increases by about 0.170 percent. Deviations in monetary policy lead to higher interest rates, which lead to lower investment and higher inflation (Lawal et al., 2018).

An increase in stock market value (VM) does not directly affect the CPI (Model 2 results in Table 8).

An increase in real GDP reduces the CPI (see the results of models 2, 3, and 5 in Table 8). Empirical results are consistent with some studies (Valdovinos, 2003; Talha et al., 2021; Dua and Goel, 2021). In this study, after estimating the models, goodness-of-fit tests are evaluated. The results of goodness-of-fit tests are presented in Table 5.

RMSEA in this study in different models shows a value equal to or less than 0.08. The value indicates the desired fit. Table 5 shows that all models' GFI and CFI values are higher than 0.9. This study examined the Tucker-Louise (TLI) or abnormal fitness index (NNFI). The results of this index show that models 1 to 4 reported values above 0.9, and model 5 showed values close to 0.9. SRMR values in all models are reported below 0.08. The CD also plays the role of R^2 in the model, which shows high values. Good fit tests indicate that all the studied models have a good fit.

5. Further Analysis

Given that from 2016m9 to 2019m3, the stock market value has not grown much, but after this date, the Iranian stock market value has experienced unprecedented growth. Therefore, the study period to better understand the results and further analysis is divided into two sub-samples, the first period (2016m9 - 2019m3) and

the second (2019m4 - 2021m9). The average growth of all variables in the two sub-samples is shown in Table 6. In the first period, the real monthly growth of the stock market value was about 0.334%, while in the second period was more than 5%. Therefore, considering whether this stock market growth has caused inflation in recent years has intensified inflation.

Table 6. Average Monthly Growth of Variables in Two Sub-Samples

Variables	VM	GDP	HP	C	M2	E	CPI
The first period	0.334	-0.125	2.714	0.315	1.740	1.00	1.667
The second period	5.083	0.323	4.199	0.717	2.654	0.009	2.523

Source: Research finding.

Table 7. Estimation Results by ML Method, First Sub-Sample (2016m9 - 2019m3)

Structural	Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
LC	LVM	-0.089	-0.089	-0.089	-0.089	-0.089	-0.089	-0.072
	LGDP	0.915***	0.915***	0.915***	0.915***	0.915***	0.915***	0.599**
	LHP	0.095***	0.095***	0.095***	0.095***	0.095***	0.095***	-0.091
	LM	--	--	--	--	--	--	0.286**
	CONS	0.795	0.795	0.795	0.795	0.795	0.795	4.207
LCPI	LC	-1.126***	-0.702***	-0.849***	-0.725***	0.206	-0.563	-1.126***
	LM2	1.280***	1.116***	1.187***	0.916***	--	--	1.281***
	LE	-0.384**	-0.252*	-0.339**		0.847***	1.039***	-0.384**
	LIR	0.223	0.185	0.139	0.084	0.114	0.441	0.223
	LVM	--	0.146*	--	--	--	--	--
	LGDP	--	-0.459*	-0.421*	-0.526**	-1.376***	--	--
	CONS	11.266	10.283	14.249***	13.279***	12.603**	0.242	11.266***
	N	31	31	31	31	31	31	31
	CD	0.978	0.978	0.980	0.976	0.924	0.898	0.980

Source: Research finding.

Note: ***, **, * denote statistically significant at the 1%, 5%, 10%, level, respectively; “L” denotes variables in natural logarithms.

Table 8. Estimation Results by ML Method, Second Sub-Sample (2019m4-2021m9)

Structural	Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)
LC	LVM	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.038**
	LGDP	0.886***	0.886***	0.886***	0.886***	0.886***	0.886***	0.745***
	LHP	0.081***	0.081***	0.081***	0.081***	0.081***	0.081***	-0.120
	LM2	--	--	--	--	--	--	0.407***
	CONS	0.491	0.491	0.491	0.491	0.491	0.491	0.690
LCPI	LC	-0.050	-0.238**	-0.180**	-0.1807**	1.84*	2.257***	-0.051
	LM2	0.999***	1.014***	0.986***	0.986***	--	--	0.999***
	LE	-1.47	-3.48	-3.64		1.01	4.15	2.58
	LIR	0.138***	0.085***	0.106***	0.1061***	-0.12	0.0618	0.138***
	LVM	--	-0.012	--	--	--	--	--
	LGDP	--	0.483***	0.437**	0.4378***	2.54*	--	--
	CONS	-4.47	-8.68	-8.76	-8.76***	-4.88	-26.74***	-4.47
	N	30	30	30	30	30	30	30
	CD	0.995	0.996	0.996	0.995	0.689	0.625	0.996

Source: Research finding.

Note: ***, **, * denote statistically significant at the 1%, 5%, 10%, level, respectively; “L” denotes variables in natural logarithms.

Therefore, the seven models in the two sub-samples are estimated for further analysis with the SEM approach. The results of these estimates are presented in Tables 7 and 8.

The results of Table 7 show the estimation of models 1 to 7 in the first period. The results indicate that the value of the Iranian stock market in the first period does not significantly affect consumption. Given that the real growth of the effect of the Iranian stock market in this period has been minimal, the slight growth of the stock market could not affect the real consumption of households during the first period. However, GDP growth and housing prices positively and significantly affect consumption. In addition, liquidity has a positive and statistically significant impact on real consumption.

In the first period, as in the whole period, the CPI decreases with increasing consumption. In addition, as expected, liquidity was an essential factor in increasing the CPI, so with a one percent increase in liquidity, the CPI has grown by about 1.281 percent (model 7). Given that the exchange in the first period was very high (Table 7), the CPI increases as the exchange rate increases in the absence of liquidity. This effect is so significant that in Model 6, with a one percent increase in the exchange rate, the CPI increases by about 1.039 percent. In the first period, interbank interest rates did not grow much, so there is no significant relationship between interbank interest rates and CPI.

The results of Table 8 show no significant relationship between stock market value and consumption in the second period. There is no indirect channel of stock market impact on inflation in Iran in this period, and severe inflation in this period has other reasons than the growth of the stock market. Rising real GDP, housing prices, and liquidity have increased household consumption through the wealth channel.

Empirical results show no significant relationship between consumption and CPI in models 1 and 7. Consumption and CPI have a negative and significant relationship in models 2, 3, and 4. In models 5 and 6, the relationship between consumption and CPI becomes positive and significant by eliminating liquidity. Increased liquidity in all models has a positive and significant effect on CPI. Since the exchange rate has grown slightly in the second period, the increase in the exchange rate has not significantly affected the CPI. There is no significant relationship between the exchange rate and CPI in the second period. While in the first period, when the exchange rate experienced high growth, it significantly affected CPI. Interbank interest rates have a positive and statistically significant relationship with CPI in models 1, 2, 3, 4, and 7. Stock market value does not

directly affect CPI (Model 2). Real GDP and CPI also have a positive and significant relationship in this period.

6. Conclusion

From 2018 onwards, the inflation rate in Iran has been about 29% on average. Iran's stock market has also experienced sharp fluctuations. Therefore, the question arises, can the growth of the stock market cause inflation with the increase in consumption? To answer this question, this study aims to investigate the effect of stock market value on inflation from the consumption channel using the monthly data of Iran during the period 2016m9 to 2021m9.

The results showed that the increase in stock market value could not increase consumption and indirectly increase inflation. The Pigou wealth channel is not established through Iran's stock market. Also, the rise in stock market value did not statistically affect inflation in Iran. The results of the estimates in different sub-samples also reported similar results. Although in the second sub-sample, from 2019m4 to 2021m9, the Iranian stock market has experienced monthly growth of over 5%, even this unprecedented stock market growth has not led to an increase in real consumption. The reason can be that the stock growth in Iran has not occurred with real factors and is not sustainable. So, this unstable growth cannot increase the real wealth of households and increase demand. Therefore, this study reported that the growth of the stock market in the period under study was not a factor in inflation in Iran through the consumption channel. Abbate et al. (2021), by examining the effect of the financial shock on inflation in the United States, argued that since the financial shock affects the supply side and causes changes in production and inflation in the opposite direction, its effects on inflation are uncertain. Some studies in other countries found that stock wealth has a heterogeneous effect on household consumption (Di-Maggio et al., 2018).

Empirical results showed that liquidity, real GDP, and housing prices increased real consumption in all the studied periods. Numerous studies have supported these results (Algaeed, 2016; Xu et al., 2018; Batrancea, 2021). Deniz and Thanasis (2023) found that income is an important factor in the consumption function of different countries. Aiello et al. (2023) observed that stock wealth affects the US economy through the consumption channel. Coskun et al. (2022) also discovered that the effects of housing wealth are greater than financial wealth on consumption in 25 OECD countries. Empirical results also showed that consumption had a negative and statistically significant effect on CPI. In

addition, the results showed that the most critical factors of inflation in Iran in the studied periods were liquidity and exchange rates, and real economic growth has helped to reduce inflation. Therefore, this study suggests that monetary policymakers should pay more attention to liquidity and its inflationary effects in Iran in implementing monetary policy. In addition, another critical step in reducing inflation is to stabilize the exchange rate.

The results of this study show that the stock market's growth has not been an essential factor in inflation in the period under investigation. Still, analyzing other variables affecting inflation helps to provide solutions to reduce inflation.

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