Original Article

# Comparing the Effects of Inflation on the Expenditure and Income of Urban and Rural Families in Iran Using a Panel Data

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## Abstract

**Purpose:** After the beginning of a new round of sanctions against Iran in 2010-2011, many disorders were introduced in the Iranian economy including increased inflation and reduced purchasing power. It has significantly affected on the welfare of families and, hence. The study objective is to compare the effects of inflation on the costs of the social welfare and income among rural and urban families.

**Methodology:** The study adopts a descriptive-analytical methodology and urban and rural families in 31 provinces of Iran constitute its units of analysis. The data was comprised of family expenditure on food and non-food items in urban and rural areas during the period of 2011-2017 (at the height of sanctions) together with inflation. The panel data was analyzed using STATA 15 software package .

**Finding:** The findings showed that inflation has increased income and, as a result, has increased costs and that a one percent increase in inflation has increased non-food costs as much as 0.43 and 0.35 and food costs as much as 0.18 and 0.22 for rural families. Similarly, by a one percent increase in inflation in urban areas of Iran, families' non-food costs have increased by 0.20 and 0.16 and their food costs have increased by 0.11 and 0.24 Overall, inflation has led to a lower increase in the expenditure of rural families, so that a one percent increase in inflation has increased the costs for urban families as much as 0.32 and for rural families as much as 0.15. Therefore, the inflation caused by sanctions has increased the gap between urban and rural area and, as a result, increased macroeconomic instability. Considering the mutual effect of income distribution, unemployment, inflation and cost on each other, the policy of adjustment of income distribution and tax on income and wealth should be implemented in an exponential manner to reduce inequality. Also, in the face of inequality, in the early stages of development, politicians can control or reduce the upward trend in poverty and inequality by using the tools of transfer payments, social security insurances, unemployment insurances, etc .

**Originality/value:** The results of this research can help organizations in charge of dealing with the effects of inflation in urban and rural areas to have a deeper insight into the existing conditions so that they can reduce the negative effects of inflation on life by using the solutions provided.

**Keywords:** cost and income, urban households, rural households, inflation effects, panel data

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## 1. Introduction

Although macroeconomic policies have a long history in shaping the economic life of human societies, they have acquired wider dimensions and expanded domains in the contemporary century (Akhavi & Hosseini, 2016: 34). On the international level, issues related to sanctions are one of the major economic policies (Noghanibehambari & Rahnamamoghadam, 2020). Since the Islamic revolution of 1978, many sanctions were imposed on Iran and a new round of sanctions were also introduced in 2005. Harshest sanctions were imposed on Iran from early 2011, and in terms of the imposing agents, they can be divided into three categories: UN sanctions, EU sanctions and main sanctions which were imposed by the US (Armanmehr & Farahmandmanesh, 2018). Some other American allies also imposed sanctions on Iran. Although Iran has been grappling with sanctions from the onset of the Islamic revolution, these sanctions entered a new phase in 2005, under the pretext of uranium enrichment program. From early 2011, more severe sanctions were imposed on Iran due to the resumption of its nuclear programs and its support of the Syrian government and resistance forces (Ezzati & Salmani, 2013) which were construed as an economic war by many experts. In March 2011, and following the sanctions imposed on the Central Bank of Iran, sanctions entered a new phase and sanctions by the European Union on Iranian oil, which were imposed since January 2012, together with restricting the Iranian banking system's access to the Society for Worldwide Interbank Financial Telecommunication (SWIFT) in March 2012, added to the severity of these sanctions (Bayat, 2015). These sanctions have different economic outcomes in Iran. Although the initial idea behind sanctions is to punish a country, in effect, they lead to increased costs for the target country, to imposition of commercial banks, to reduced joint projects, to prohibition of financial aids (Hufbauer & Jung, 2021) and ultimately, in the form of increased stagnation taxes, inflation, and shortage of consumer staples, they are imposed on people (Akhavi & Shams al-Dini, 2016). With regards western and US sanctions on Iran, it is worth mention that, to some extent, there was a consensus in the western world on the importance of Iranian sanctions, since the over reliance on oil dollars is the Achilles' heel of the Iranian economy. Therefore, they did their best to restrict Iranian oil exports and to impose various other limitations. Aforementioned weaknesses have made the Iranian economy vulnerable to external events that influence the market (Taybi & Sadeghi, 2017). Meanwhile, one of the main consequences of sanctions is its effect on inflation. Inflation which refers to the sustainable increase in general price levels and exerts pressure on both the society and people is an outcome of sanctions (Peksen, 2019). Since in the viewpoint of those who impose such sanctions, they lay the ground for people to compel authorities to change their actions (Taybi & Sadeghi, 2017). The historical experience of the Iranian economy indicates that when exchange-rate shocks are accompanied by a rapid growth in money supply, inflation is manifested at a higher level compared to its chronic, structural trend in the Iranian economy and affects people's lives. Expenditure and changes in price levels are among the items that are affected by inflation, either directly or indirectly. Inflation is known as the most important challenge in the economic life of countries and is the main factor for the continuous increase in prices and reduced purchasing power of a country's currency which imposes many costs on society. Nowadays, inflation is a major problem and economic weakness and one of the main topics of discussion in the Iranian economy (Akkol, 2016).

A salient economic effect which has made people feel inflation within the context of their lives concerns its effect on the economic growth and their purchasing power (World Bank, 2020). Compared to other macroeconomic variables, Inflation, which is defined as an increase in the general price levels in a specific period, receives more social attention from the general public and severely affects income and, over time, leads to a gap between the poor and the rich in the society and reduces the welfare of low-income families (Sameti & Izadi, 2013). Naturally, increase in inflation levels and the concomitant increase in general price levels are not commensurate and they have different effects on various income levels (Carr & et al, 2019). Importance of the inflation and its different effects on the society, such as levels of welfare, income, macroeconomic policies, purchasing power, etc. has secured an important position for this concept in the economy. Inflation, and its relationship with welfare, has always been a topic of interest to researchers since lower inflation leads to increased welfare and self-sufficiency for families and increased levels of welfare can also affect other aspects of family life.

Studying expenditure levels among urban and rural families in the current situation has a specific importance for at least two reasons: first it constitutes a major aspect of social justice and second, it influences food, economic and social capital security (Tarasuk & et al, 2019). Studying the relationship between inflation, expenditure and income in a society helps identify relative power and the poverty status in that society (Booth, 2019). Therefore, income and expenditure patterns, regardless of guiding various systems, have turned into an objective in economic planning (Rouhani, 2015). Since expenditure and income of urban and rural families play a crucial role in determining levels of social welfare and general economic conditions, studying them is of paramount importance (Haar & et al, 2018). Following the economic sanctions, the overall status of the economy in Iran has greatly affected the livelihood of families. Needless to say, that levels of inflation along with expenditure and income levels of rural and urban families directly affect levels of welfare and this is an issue with which various societies have been grappling for a long time (Sharma & et al, 2015: 1). In general, the importance of the effect of economic inflation on the well-being of people in society is that with the increase in inflation, people's feeling of relative deprivation increases and their purchasing power decreases, and they have less time to be happy with their families, their sense of satisfaction with their lives decreases and They will feel a lot of concern about their future, source of income and their job and financial situation. In the meantime, some things besides inflation have affected the country's economy, including embargo, urban-rural inequalities, unemployment, poverty, etc., which are examined in detail in this research. Considering what was mentioned, the main research question is as follows: how has inflation affected the income and expenditure levels of rural and urban families during economic sanctions?

## 2. Research Theoretical Literature

Income distribution has been of special importance in the theories of economists. In recent years and after the plan to reduce poverty in the world, the way of distribution of income and expenses has been paid more attention than before, because in today's world, the biggest cause of poverty is the unfair distribution of income (Iranian Statistical Center, 2015). In this context, Adam Smith believed that economic agents in the field of micro-decisions and in the field of production and consumption achieve an optimal and balanced choice by maximizing certain objective functions. This balance automatically leads to macro balance. Because in the economy, whatever quantity of goods is supplied, the demand for it will be created. Therefore, the equivalent supply creates the income of production factors, and the total product is distributed among those factors in proportion to the participation of different production factors in its production. Factors of production either save their income or their consumption and savings are all spent on investment and demand for capital goods. Therefore, the equivalent of the total supply and demand is created (Carr & et al, 2019). In here, the implicit assumption of the classical model is that economic conditions and the way incomes are distributed will lead to asymmetry and imbalance in the society and will bring uncertainty in the economy. Empirical theories related to the economy in the world in recent times largely confirm this view (Kindangen & et al, 2017). In the middle of the 19th century, Karl Marx, as a classical economist of the third generation, predicted the emergence of such inconsistency. He called this inconsistency as the crisis of disproportion. The concern about the possibility of such a problem is well understood in the writings of John Stuart Mill, who was a contemporary of Marx (Cappelen & et al, 2020).

In any case, in such a situation, macro balance is not automatically provided and the need for macroeconomic analysis becomes relevant. This inconsistency between cost and income and this imbalance of supply and demand continued as a serious problem of the capitalist system until the beginning of the 20th century, and in addition, existing inequalities affect all aspects of life (Haar & et al, 2018). In the following, a number of economic theories are mentioned in the discussed field.

A- Income distribution in the theories of classical economists.

In the past, paying attention to income distribution was considered exclusively in the production stage and among the factors participating in it. Classical economists were interested in how to distribute national income among different parts of the population. They considered the basis of this distribution to be the ownership of factors and raised the issue of income distribution based on the ownership of production factors (Manduca, 2019).

Ricardo's Theory: The classic distribution theory is mostly attributed to Ricardo. In Ricardo's theory, the economy is divided into two major sectors: industry

and agriculture, but what happens in the agricultural sector plays an important role in the overall development of the economy. According to Ricardo, the distribution of production among its three factors, i.e. labor, land, and capital, changes over time in favor of rent and to the detriment of profit. Therefore, Ricardo believed that in the capitalist system of the 18th century, the distribution of income is done in such a way that the owner class is in prosperity (Dosi & Roventini, 2019).

Marx's theory (1883-1818): Marx criticized the classical economic ideas and emphasized that the attention of the classics was only towards the positive economy and they did not use the prescriptive economy which is actually necessary to solve the economic and social problems (Rouhani, 2014).

B. Neoclassical theories of income distribution

Neoclassical economics is a method that focuses on price determination and income distribution in markets through supply and demand, often through the assumed maximization of utility by income-limited individuals and profit by cost-limited firms (Haldane & Turrell, 2018).

Marshall's theory (1960): According to Marshall, supply and demand is a mechanism that, in addition to determining the price of goods, can also determine the price of factors. Marshall made a special connection between the theory of value and the theory of distribution that existed in classical economics (Hommes, 2021).

Clark's theory: Clark emphasized the existence of a personal distinction between measurable capital goods and abstract aspects of social capital (Bresser-Pereira, 2020: 637).

Keynes' macroeconomic theory: In the 1930s, Keynes, by properly analyzing the economic situation of advanced countries and recognizing the roots of inequality and imbalances in the economy, suggested that the government should administer pro-equality policies (Bems & Johnson, 2017).

In the direction of the effect of macroeconomics on income distribution in the oldest empirical articles, Schultz investigated the effect of inflation and lack of jobs to pay the income of households using the time series of 1944-1965. The results showed that employment had an increasing effect and inflation did not have a decreasing effect on inequality. After her, Blinder and Esaki in the time period of 1947-1974 in an econometric study investigated the effects of inflation and unemployment on the income distribution of the United States of America. They summarized the distribution of income in quantiles and concluded that unemployment had an unequal effect and inflation had an equalizing effect on the distribution of personal income. Li and Hing Fu (2002) showed that the existence of inflation worsens the income distribution situation among households, increases the income share of the rich class, and has a negative but insignificant effect on the income share of the middle class and the poor. Heinz and Udo (2008) also identified the economic factors determining the level of well-being in 12 countries of the European Union during the period 1991 to 2003 in order to investigate economic integration and life satisfaction. To estimate the equation of life satisfaction, they used explanatory variables of unemployment rate, inflation rate and per capita income. The results show that among various macroeconomic indicators, the inflation rate has played a major role in life satisfaction. Di Tella and MacCulloch (2008) in their study showed that the life satisfaction data of more than 600,000 Europeans have negative effects in relation to the unemployment rate and the inflation rate. Also, the results show that emotions are influenced by macroeconomic fluctuations. Satisfaction with life is one of the most important emotions that are influenced by these variables. Luengas and Ruprah (2009) investigated whether happiness should be one of the goals of the central bank in 17 Latin American countries during the period from 1997 to 2006. In this study, life satisfaction as a dependent variable and unemployment, inflation rate, demographic variables such as gender, age, education, etc., country fixed effects and year fixed effects were used as explanatory variables. The obtained results indicate that unemployment and inflation have caused a decrease in happiness. However, the evidence shows that unemployment has caused more unhappiness than inflation. Shimeles (2011) In his article, investigated the reduction of effective welfare from the price change of 13 goods in the African continent. The results show that changes in food prices can lead to a decrease in welfare compared to changes in the prices of energy or other goods. Kaya & Şen (2013) The empirical findings indicate that there is a uni-directional causality running from spending to tax revenue. In other words, our findings support the spend-and-tax hypo thesis for fiscal discipline in Turkey over the periodof1975-2011. Attanasio et al. (2013) investigated the welfare effects of food price increases on households in Mexico during the years

2006-2009. This research showed that with the increase in food prices, the income of needy households has decreased. Ebeke and Fouejieu (2018) showed that countries that have used inflation targeting; On average, they have had more flexible exchange rate regimes than other emerging economies and moderated the unwanted effects of inflation on the sudden increase in Kurds' expenses and the decrease in people's purchasing power. Yelena & Faryal (2016) Using seasonal data of the time period of 1999-2015 and the vector autoregression (VAR) method, they investigated the effect of oil prices and sanctions on the Russian economy. The results showed that the Russian economy is highly affected by fluctuations in oil prices and sanctions (through affecting the income from oil exports). AlAzzawi (2017) showed that when the level of inflation is high, people resort to suitable alternatives to protect themselves against a decrease in the level of well-being. In order to accurately control the changes in the cost of living, it is necessary to create real life indicators to check whether households at different income and expenditure levels have experienced different rates of cost of living and whether one group is consistently worse off than others. The results of Permik and Stanisławska study (2017) showed that inflation has a negative effect on saving attitude, especially in the group of consumers who are known to have a very good economic status. Teryoshin's study (2017) showed that if the monetary policy in the country is effective, inflation may decrease; While a strong monetary policy reduces inflation and increases household welfare. Uncertainty about the timing of changes in targeted inflation leads to more stable paths and, often, greater welfare. Gärling (2013) concluded in his study that people who have a dynamic role in the economy determine the rate of inflation. In general, it was found that in the case of inflation, the prices of products increase compared to before, and the increase in income becomes an opportunity to increase consumption. In general, the rate of inflation has a direct effect on the amount of expenditure and income of households. In their research, Muhibbullah and Das (2019) showed that if inflation increases by 1%, income inequality increases by 99.4%. The result of the vector error correction model (VECM) shows that inequality needs approximately 0.35% to correct the error per year and inflation needs 22.7% to correct the error per year to achieve equilibrium. Ouyang and Rajan (2019) also showed in their research that the inflation rate between 1980 and 2015 has been affected by the financial policies of the country, so that with the development of domestic and international markets as well as the increase of bank funds, the inflation rate has decreased and also Ndou et al. (2019) concluded that sudden monetary policy shocks caused by inflation have different effects on spending and income and consumption in rural areas. The higher the inflation rate, the more rural expenses and incomes will decrease and the rural poor will suffer more.

A review of the conducted researches showed that inflation and economic conditions are among the factors that affect the lives of people in a society, in such a way that in some studies it was found that inflation affects the level of equality and inequality of people receiving services (Schultz, Blinder and Esaki, Li and Hing Fu, Muhibbullah and Das). Some other studies (Heinz and Udo, Luengas and Ruprah, Shimeles, Attanasio et al, AlAzzawi and Teryoshin) concluded that inflation increases the cost of households and reduces the level of well-being. Therefore, most of the studies have only examined the general impact of inflation on the lives of people in the society. But what is new in this study compared to other studies is the investigation of the impact of inflation on the lives of households in urban and rural areas, as well as on the cost of living, including food and non-food, which has not been discussed in other studies. Therefore, the purpose of the present study is to investigate the impact of inflation on the spending of urban and rural households and the difference between them, the amount of income and the level of well-being and wants to measure the impact of inflation on the amount of food and non-food expenses between urban and rural households.

## 3. Research Methodology
### 3.1. Geographical Scope of the Research
The area under study is comprise of 31 provinces of Iran and levels of expenditure and cost for each province were separately obtained for rural and urban regions.
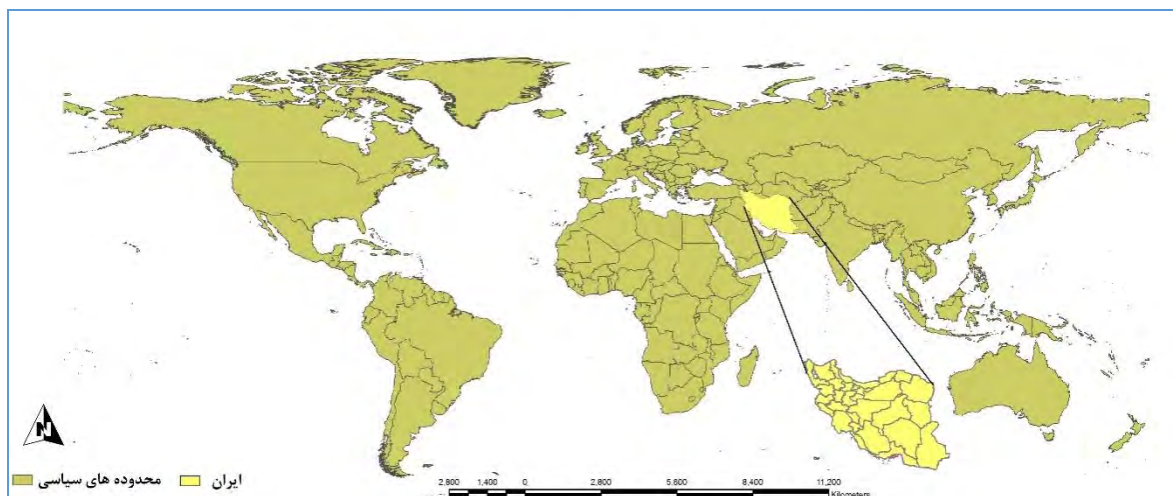
**Figure 1. Introduction of the study area**

### 3.2. Methodology

The present study is applied research and in terms of method, it's a descriptive-analytical one. The provinces of Iran constitute the units of analysis in the study. Using the data provided by the Statistical Center of Iran, the study measures and compares the effects of inflation on families' income and expenditure in urban and rural societies of the country. To this end, "Inflation Rate Index" which is calculated and published by the central bank of Iran on a monthly basis was used for inflation. This index measures the volatility of prices of goods and services in a specific year relative to a base year and is known as the "Consumer Price Index" (CPI). Data related to the expenditure (on food and non-food items) in urban and rural families was obtained from 2011 (the base year) to 2017. To analyze the data, considering the time-series nature of the data in terms of variability in a 7-year period and its dispersion, panel data analysis was used using STATA 15. The data pertaining to non-food expenditure indices is comprised of 8 categories (healthcare, education, housing, entertainment, transportation and communication, clothing, shoes, and household expenditure) and food costs are comprised of 9 categories (cigarettes, cereals, drinks, fruits and vegetables, beans, meat, dairy, sweets, oil and fat).In addition, sources of income include all public, cooperative, private, self-employment, agricultural, non-agricultural and miscellaneous income which are published by the Statistical Center of Iran. In statistics and econometrics, panel data are data sets comprised of some data in time and place which include N factors in T time periods. If the number of time observations are equal for all the factors in the panel, it is a balanced panel but in case some factors have missing observations, the panel is an unbalanced one. In addition to, as some of the statistics for some endogenous variables are missing in some years, unbalanced data was combined to estimate the model. In this study, four independent variables (income and expenditure for urban and rural families) and two dependent variables (urban and rural inflation rate) were used. In order to measure variables, first using the available data, the value for each variable for all the provinces was separately calculated for rural and urban regions, based on a fixed price and the national currency (Rial), and, then, it was normalized for all the variables.

## 4. Research Findings

Considering that the panel data in the study included time-series data for the period between 2011 and 2017, first we tested the presence or lack of a long-term relationship among the variables of the model. To this end, correlation, stationary and integration tests were used. Moreover, considering that numerous methods exist for estimating panel data, Housman test was used to find the proper method of estimation.

### 4.1. Correlation Test

According to table 1, changes in levels of inflation in the studied period in rural and urban regions, due to an increase in inflation, have led to an

increase in food and non-food expenditure and

have reduced the purchasing power of people.

**Table 1. Correlation between research variables in the rural families**

| Inflation rate | | Urban inflation rate | | Rural inflation rate | | Variables |
|---|---|---|---|---|---|---|
| | | Level of Significance | Correlation | Level of Significance | Correlation | |
| | | | | 0/00 | 0/55 | Non-food costs for rural families |
| | | | | 0/00 | 0/47 | Food costs for rural families |
| | | 0/00 | 0/68 | | | Food costs for urban families |
| | | 0/00 | 0/71 | | | Non-food costs for urban families |
| 0/003 | 0/72 | | | | | Costs for urban families |
| 0/001 | 0/52 | | | | | Costs for rural families |

Changes and fluctuations of correlation show that in the rural regions of Iran, there is a statistically significant positive relationship between changes in inflation and food and non-food expenditure. In other words, as inflation increases, costs increase commensurately and this increase is higher for non-food items. The results of correlation show that the highest level of marginal propensity caused by the inflation effect pertains to the expenditure of urban families in Iran, such that, for urban families, the correlation between food and non-food expenditure and inflation is equal to 0.68 and 0.71, respectively. Considering that urban families earn some of their income from oil export revenues, compared to rural regions, they have been more affected by the inflation caused by sanctions, to the extent that this value is equal to 0.52 and 0.72 for rural and urban families, respectively.

### 4.2. Presenting the Empirical Results of Model Estimation

Stationary tests are among the most important test for estimating a regression with reliable coefficients. In order to avoid spurious regression, stationary tests are used. Numerous tests exist for determining the stationary of panel data. In a general classification, we can say that when the time-series under study is long and cross-sections are limited, more attention should be paid to the issue of autocorrelation.

### 4.3. Stationary Test of the Variables

A common test in panel data is the Levin–Lin–Chu (LLC) test for unit root which determines the stationary of variables and the results of this test are shown in the table 2.

**Table 2. Results of the stationary test based on LLC**

| Status | Level of significance | Value of test statistic | Variable | Affected population |
|---|---|---|---|---|
| I (0) | 0/0023 | -2/70 | Non-food costs for families | Village |
| I (0) | 0/0041 | -4/00 | Food costs for families | |
| I (0) | 0/0012 | -1/7 | Non-food costs for families | City |
| I (0) | 0/0036 | -3/4 | Food costs for families | |
| I (0) | 0/003 | -4/50 | Urban inflation rate | City |
| I (0) | 0/0028 | -1/20 | Rural inflation rate | Village |
| I (0) | 0/00 | -6/20 | Family income | Village |
| I (0) | 0/00 | -1/6 | | City |

In fact, to avoid spurious regression, the reliability of variables in panel data is tested using LLC test and the outcome is depicted below. The results show that all variables are significant at a 99

percent level of Significance and spurious regression will not be an issue for estimating the model.

### 4.4. Limer's F test

In order to determine whether we have panel or pool data, Limer's F test was used. Here there are two possibilities: either we have pool data which needs to be estimated using common effects method or we have panel data which needs to be estimated using either fixed effects or random effects methods which are presented in the following sections (Table 3).

#### Table 3. Results of Limer's F test

| Statistical test of combined data | | | | | | | Control Variables | Dependent variable |
|---|---|---|---|---|---|---|---|---|
| Estimation status | P-Value | 95 percent confidence interval | | T statistic | Standard Error | coefficients | | |
| | | upper | lower | | | | | |
| panel | 0/00 | 57223/2 | 27521/5 | 5/63 | 0/19 | 31/37 | Rural inflation rate | Costs for rural families |
| panel | 0/00 | 29912 | -5491 | 1/36 | 0/016 | 0/12 | Urban inflation rate | Costs for urban families |
| panel | 0/00 | 0/54 | 0/35 | 9/36 | 0/048 | 0/45 | Rural inflation rate | Income for rural families |
| panel | 0/00 | 1/44 | 0/81 | 6/60 | 0/016 | 1/12 | Urban inflation rate | Income for urban families |

Considering that the test statistic is not statistically significant at a 0.05 level, the results show that the null hypothesis is rejected and that panel data should be used in the model. Moreover, to determine whether fixed effects or random effects should be adopted, we ran the Housman test and the results showed that random effects should be used.

### 4.5. Housman Test

After confirming that the data is dynamic, we used Housman test to determine the type of panel data (to utilize either fixed effects or random effects) (Table 4).

#### Table 4. Results of Housman test

| Conclusion | Level of significance | Value of test statistic | Statistic | Test | Control variable | Dependent variable | Affected population |
|---|---|---|---|---|---|---|---|
| Fixed effects method | 0/023 | 5/13 | $\chi^2$ | Hausman | inflation | Non-food costs | Rural families |
| | 0/009 | 0/16 | | | | Food costs | |
| | 0/004 | 8/3 | | | | Family Income | |
| | 0/000 | 12/50 | | | | Non-food costs | Urban families |
| | 0/000 | 9/14 | | | | Food costs | |
| | 0/007 | 6/5 | | | | Family income | |

As can be seen, Housman tests results show that the H0 is rejected. Therefore, the effect of inflation on income and expenditure of rural and urban families is confirmed at a t 0.05 level of significance and the null hypothesis concerning the linear relationship between inflation fluctuations and the concomitant changes in rural and urban families' income and costs are confirmed. Therefore, we can say that changes in family income and costs are directly influenced by inflation.

### 4.6. Fixed Effects Model

Although changes of error terms should be completely random through time, the results of autocorrelation tests revealed a pattern in their changes; but considering the level of significance, which for the variables of the study is lower than 0.05, we assume that the variables of the study are not auto correlated. In the present study, fixed effects method was used and the results are shown in table 5.

**Table 5. Results of estimating the effects of income and levels of inflation on rural family expenditure over time using a fixed effects model.**

| Combined data tests | | | Dependent variable | Control variable |
|---|---|---|---|---|
| **P-Value** | **Test or test statistic** | **coefficient** | | |
| 0/000 | 12/78 | 0/352 | Non-food costs in urban areas | Inflation in urban areas |
| 0/004 | 15/60 | 0/43 | Food costs in urban areas | |
| 0/0056 | 19/16 | 0/64 | Urban family income | |
| 0/0032 | 0/55 | 0/183 | Non-food costs in rural areas | Inflation in rural areas |
| 0/0006 | 0/57 | 0/22 | Food costs in rural areas | |
| | 21/19 | 0/79 | Rural family income | |
| 186 | | | | Number of observations |
| 0/46 | | | | $R^2$ |
| 29/35 | | | | F statistic |
| 0/000 | | | | P-value |

According the table, levels of inflation in the studied period had a statistically significant effect on increasing family costs. The results showed that one percent increase in inflation in urban areas leads to a 35 percent increase in non-food and a 43 percent increase in food expenditure. Similarly, in rural areas, one percent increase in inflation leads to an 18 percent increase in non-food and a 22 percent increase in food expenditure. Overall, using fixed effects method, we can say that increased levels of inflation in society are accompanied by increased food and non-food expenditures and costs, and this increase is higher for food expenditure. With regards to changes in income levels, the results of the study show that as levels of inflation increase, the real income of people decreases in comparison with their daily costs and expenditures. In other words, as levels of inflation in society increase, owing to higher prices and costs and also higher wages, increase in people's income is accompanied by an exponential increase in prices but this does not mean that that the level of welfare in society has increased. Most judgments regarding the relationship between inflation and income follow a pessimistic viewpoint. In countries such as Iran where the government plays a major role in the economy, major changes in money supply are undertaken by the government and inflation is somehow inevitable and is in the hands of the government. This kind of saving is called inflation tax in the economic jargon. In fact, by increasing money supply and creating inflation, government somehow imposes a tax on people in the form of increased prices and a sort of wealth flow is created from those with fixed incomes toward those who benefit from increased money supply. This process takes place via expansion of funds and exacerbates economic problems and widens the poverty gap in the society.

*4.7. GMM estimation*

In addition to estimating the model using fixed effects, to better control for Endogeneity of variables and to overcome autocorrelation, we also estimated the model using GMM and the results are as follows (Table 6).

**Table 6. Results of the effects of inflation on family expenditure using GMM**

| Statistical test of combined data | | | Control variable |
|---|---|---|---|
| **P-Value** | **Test or test statistic** | **coefficient** | |
| Food costs for rural families | | | Rural inflation |
| 0.000 | 7.12 | 0.16 | |
| Non-food costs for rural families | | | |

| Statistical test of combined data | | | Control variable |
|---|---|---|---|
| P-Value | Test or test statistic | coefficient | |
| 0.005 | 9.46 | 0.20 | |
| Costs for rural families | | | |
| 0.001 | 11.32 | 0.15 | |
| Rural family income | | | |
| 0.021 | 13.09 | 0.18 | |
| Food costs for urban families | | | Urban inflation |
| 0.000 | 6.19 | 0.11 | |
| Non-food costs for urban families | | | |
| 0.004 | 11.44 | 0.24 | |
| Costs for urban families | | | |
| 0.006 | 14.16 | 0.32 | |
| Urban family income | | | |
| 0.0001 | 14.07 | 0.17 | |

As is shown in the results, a one percent increase in inflation in rural regions leads to a 0.16 and 0.20 percent increase in food and non-foods expenditure for rural families, respectively. Similarly, in urban areas, a one percent increase in inflation levels leads to a 0.11 and 0.24 percent increase in food and non-food expenditure, respectively. According to the results of this table, it can be said that the changes caused by inflation show themselves more noticeably in the income and expenditure changes of the residents of urban areas. Because the more the inflation changes, the more the level of incomes and expenses will be affected.

## 5. Discussion and Conclusion

In the present study, direct and indirect effects of sanctions on the economy was evaluated with a focus on inflation. In this regard, model estimation revealed that exchange shocks created by the sanctions can lead to import inflation which directly reduces income levels and increases living costs in Iran. Considering that inflation and price change, as some of the most important macroeconomic variables, are highly socially sensitive for consumers and their effects on their welfare is considerably noticeable, it seems necessary to measure welfare changes created by price changes, for the purpose of becoming familiar with consumer welfare and making decisions for offering relief mechanisms to sustain consumers' levels of welfare following price increases. During the period from 2011 to 2017, the consumer price index for various product categories has had different changes and exerted various effects on consumers. For this reason, two groups of food and miscellaneous costs were considered and, using regression for food expenditure, the minimum livelihood and the marginal propensity for additional living costs among rural and urban families in different provinces of Iran were calculated and the results showed that inflation has an effect on the studied indices. Factors affecting food and non-food costs of urban and rural families, especially in developing countries which entail the lowest income-earning segments of the society, are a concern for policy makers in all countries. Specifically, the relationship between inflating and economic costs has been a challenging area in the field of economics in the second half of the 20th century since levels of access to economic welfare and enjoyment of facilities is dependent upon economic conditions (income, taxes, and inflation). In the late 1950s, Cozens and Kaldor presented the first theories to explain the relationship between macroeconomic variables and cost and welfare. And it can be said that their opinions investigated this relationship until the 1990s and found a meaningful and positive relationship between these two indicators. For this reason, many studies have been conducted in this direction. One of the issues that affects the economic growth and development of any country is the discussion of the relationship between the three variables of inflation and income and

expenditure among households, which directly and indirectly affects inflation, income and expenditure.

In late 1950s, Kuznet and Kaldor presented the first theories for explaining the relationship among macroeconomic variables and cost and welfare and we can say that until 1990s, their theories were used to investigate this relationship and identified a statistically significant relationship between these indices. Considering the importance of this issue, many studied were conducted in this regard. One issue affecting the growth and the economic development of every country concerns the relationship among the three variables of inflation, income and family expenditure and inflation influences income and expenditure both directly and indirectly. Hence, in the present study, levels of family expenditure (on food and non-food items) in two urban and rural communities were analyzed using both the fixed effects method and also system Generalized Method of Moments. The estimations show that, in the period from 2011 to 2017, changes in inflation had a positive, fixed effect on increasing food and non-food expenditure and reducing real income in both rural and urban communities in 31 provinces of Iran. Inhabitants of cities and villages have dealt with costs and income using both the economic control variable of levels of income and also changes in inflation. Such that, according to the findings, we can say that higher levels of inflation increase the cost of necessaries and also higher levels of inflation in the society increases urban and rural families' expenditure for food and non-food itemsو exponentially. Therefore, policy makers and politicians need to pay more attention to such changes to increase economic development and family welfare and to control the influential variables with the aim of increasing levels of welfare. Moreover, the results showed that increased levels of inflation can significantly reduce individuals' income and, ultimately, reduce levels of welfare among families. Calculation of studied indices revealed that inflation has a greater effect on urban families' income and expenditure and this holds true for food and none-food expenditure. As for rural families, this effect is lower compared to their urban counterparts. Imposed sanctions in recent years and reduced levels of imports and exports are among the factors that have contributed to this issue. In fact, since a large

portion of the budget for urban settlers is financed by selling and exporting petroleum, they are more affected by exchange rate shocks created by sanctions on imports and exports. However, villages, considering their dynamism and their role in producing essential goods, are less influenced by inflation and sanction. Sanctions have been the most challenging debate in Iran's foreign policy and economic relations during the last decade. The pervasiveness and entanglement of sanctions involved various political and economic elements of the country and faced many obstacles to economic growth. The non-agreement on the JCPOA and as a result the country's non-entry into the international community affected the increase in inflation in the incomes and expenses of households and brought many negative consequences for the people, especially the deprived classes. In general, it was found that the sudden changes caused by financial and monetary policies and the increase in inflation have a significant impact on the amount of expenditure and income as well as the amount of household consumption in urban and rural areas. In this way, the higher the inflation rate, the higher the costs and the lower the purchasing power. Also, based on the findings, it can be said that the effects of inflation on urban areas are more and faster than on rural areas, and in this regard, the rural poor, who constitute a larger number of the society, suffer.

The results of this study are in line with the results of Blinder and Esaki, Li and Hing Fu, Attanasio et al., Shimeles, Ndou et al., because inflation has an effect on the unemployment rate, decreasing well-being and as well as increasing dissatisfaction and decreasing incomes. Also, due to the fact that controlling inflation and reducing it has an effect on people's satisfaction and reducing economic problems and improves living conditions, it is in line with the research results of Heinz and Ode, De Tella and MacCulloch, Luengas and Ruprah, Aybek and Fuji, AlAzzawi, and Teryoshin. This research is innovative in terms of using the latest statistical time series data as well as investigating the effects of inflation in urban and rural areas and intervening factors and variables.

In order to rein in inflation, prior to adopting any policy, it is necessary to implement the mentioned structural reforms in the Iranian economy. Central bank independence, formulating a strong and

reliable tax system, departing from single-product exports, diversifying non-petroleum exports to reduce the dependence of foreign reserves and the national budget on oil dollars and to hinder the contagion of oil shocks to the currency market, together with diversifying the rural economy are important reforms that should be high on the agenda of macroeconomic policy makers. In case these reforms are introduced, on one hand, oil shocks are transmitted to currency market to a lesser extent and, as a result, the currency market experiences less fluctuation and general price levels are not much influenced by these fluctuations and, on the other hand, the budget deficit created by sanctions on oil, instead of taking loans from the central bank, can be covered by proper tax revenues and by the income generated through non-petroleum exports. This way the effects of sanctions on the Iranian economy and also the general price levels are less salient and the government faces much fewer problems in advancing its intended national and international policies. Considering that foreign countries are increasing their sanctions on oil revenues and taking the weakness of financial institutions in to account, we can conclude that, in oil exporting countries, investment is not enough in itself unless it is accompanied by a developed financial system which channels such vast revenues toward high-return, productive activists and acts as a stimulus for economic growth in the long run. Moreover, no investment should be made in low-return projects to reduce the vulnerability to foreign shocks to a minimum and to help the Iranian economy achieve its dynamism. Other practical suggestions include increasing domestic production and reducing the export of goods and primary items, which will lead to a decrease in inflation by increasing production and preventing exports. Considering the mutual impact of income distribution, unemployment, inflation and various costs on each other, the necessary policies to adjust income distribution should be selected and implemented, one of which is the progressive income and wealth tax of individuals, which leads to the reduction of inequality. Also, in the face of inequality, in the early stages of development, politicians can control or even reduce the upward trend in poverty and inequality by using the tools of transfer payments, social security insurances, unemployment insurances, etc. Since the effect of inflation on the Gini coefficient is not the same in urban and rural areas, as well as different income groups, and because "low income groups usually have the highest costs for buying essential goods, discriminatory policy is suggested in the distribution of subsidized goods." For example, in order to reduce inequality, the distribution of vouchers should be done among some of the lower sections of the households' expenditure groups. Also, among the limitations of the above study, we can mention the lack of statistics regarding urban and rural income and cost indicators, limited access to information, time-consuming data analysis, and some data are not up-to-date.

## Authors' contributions
The authors equally contributed to the preparation of this article.

## Conflict of interest
The author declares no conflict of interest.

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**Original Article**

# مقایسه اثرات تورم بر هزینه کرد و درآمد خانوارهای روستایی و شهری در ایران بر اساس الگوهای داده‌ای پانل

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## چکیده مبسوط

## ۱. مقدمه

پرداختن بـه الگـوی هزینـه‌کرد در بـین خانوارهـای شـهری و روستایی در شرایط فعلـی دسـت کـم بـه دو دلیـل از اهمیـت ویژه‌ای برخوردار است: نخست بُعد مهمی از عدالت اجتماعی را تشکیل می‌دهد؛ دوم روی امنیت اقتصادی، سرمایه اجتمـاعی- غذایی و غیره تـأثیر می‌گـذارد. مقایسـه رابطـه بـین وضـعیت تورمی و هزینه‌کرد و درآمد جامعه بـه معنـی شناسـایی تـوان نسبی و وضعیت فقر در بین آن‌ها می‌باشد، بنـابراین چگـونگی الگـوی درآمدهـا و هزینه‌هـا صـرف نظر از جهت‌گیـری نظام‌هـای مختلـف، یکـی از اهـداف دولت‌هـا در برنامـه‌ریزی اقتصـادی درآمده است. از آنجایی‌کـه هزینـه کـرد و درآمـد خانوارهـای شهری و روستایی در تعیین سطح رفاه اجتماعی و شرایط کلی اقتصاد نقـش مهمـی دارد، بررسـی آن از اهمیـت بسـیاری برخوردار است. بدیهی است میزان تورم و مقدار هزینـه کـرد و درآمد خانوارهای شهری و روستایی، به طور مستقیم بر سـطح رفاه اثرگذار خواهد بـود و ایـن موضـوعی اسـت کـه از دیربـاز گریبان‌گیر جوامع مختلف بوده است. به طورکلی اهمیت تـاثیر تورم اقتصادی بر رفاه زندگی افراد جامعه تاجایی اسـت کـه بـا افزایش تورم احساس محرومیت نسـبی مـردم بیشـتر شـده و قدرت خرید کاهش پیدا کـرده و وقـت کمتـری را بـرای شـاد بودن در کنار خانواده دارند، احساس رضایت از زنـدگی آن‌هـا کاهش پیدا کرده و احساس نگرانی زیـادی در مـورد آینـده، منبع درآمد و وضعیت شغلی و مالی خود خواهند داشت.

## ۲. مبانی نظری

توزیع درآمد در نظریه‌های اقتصاددانان اهمیـت ویـژه داشـته است. در سال‌های اخیر و بعد از عنوان شدن طرح کاهش فقر در جهان، چگونگی توزیع درآمد و هزینه‌ها بیش از پیش مورد توجه قرار گرفت، زیرا در دنیای امروز بزرگترین عامـل ایجـاد-کننده فقر توزیع ناعادلانه درآمد است. آدام اسمیت معتقد بود که عوامل اقتصادی در حوزه تصمیمات خرد و در قلمرو تولیـد و مصرف با حداکثرکردن توابع هدف معین به انتخاب بهینـه و تعادلی دست می‌یابند. این تعادل به طـور خودکـار بـه تعـادل کلان منجر می‌شود. زیرا در اقتصاد، هر مقدار کالا عرضه شـود تقاضا بـرای آن ایجـاد خواهـد شـد. فـروض ضـمنی الگـوی کلاسیک این است که شرایط اقتصادی و نحوه توزیع درآمدها، به عدم تقارن و بی‌تعـادلی در جامعـه منجـر خواهـد شـد و نااطمینـانی موجـود در اقتصـاد را همـراه خواهـد داشـت. نظریه‌های تجربی مربوط به اقتصاد در جهان در دوران اخیر تا حد زیادی این دیدگاه را تأیید می‌کند.

## ۳. روش تحقیق

پـژوهش حاضر از نـوع مطالعـات کـاربردی و روش تحقیـق توصیفی- تحلیلی است. واحد تحلیل اسـتان‌های کشـور ایران است. در این پژوهش با استفاده از داده‌هـای مرکـز ملـی آمـار ایران به اندازه‌گیری و مقایسه اثر تورم بر هزینه کـرد و درآمـد خانوارها در بین جوامع شهری و روستایی کشور پرداخته شده است.

*. نویسندۀ مسئول:

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در این زمینه داده‌های مربوط به تورم از «شاخص نـرخ تـورم» که به طور ماهیانـه توسـط بانـک مرکـزی محاسـبه و منتشـر می‌شود، استفاده شده که نوسان‌های قیمت کالاها و خدمات را در یک سال خاص نسبت به سال پایه می‌سنجد و این شاخص در ایـران بـا عنـوان «شـاخص بهـای کـالا و خـدمات(CPI) » معروف است. در خصوص جمع‌آوری اطلاعات مربوط به هزینه کرد (خوراکی و غیرخـوراکی) خانوارهـای شـهری و روسـتایی طی سری‌های زمانی ۱۳۹۰ (سال پایـه) الـی ۱۳۹۹ بـه دسـت آمد و درنهایت به منظور تجزیه و تحلیل داده‌هـای موجـود در پژوهش و با توجه به ماهیت زمانی داده‌ها به لحاظ متغیر بودن در دوره آماری ۱۰ ساله و پراکندگی آن، از روش پانل دیتا در نرم افزار آماری STATA 15 استفاده شد.

**۴. یافته های تحقیق**

بر اساس یافته های تحقیق مشخص گردید که سـطح تـورم در جامعه در سیر زمانی مورد مطالعه، اثر معنـاداری بـر افـزایش هزینه‌های خانوارها داشته است. طبق نتایج یک درصد افزایش تورم در نواحی شهری منجر بـه افـزایش ۳۵ درصـدی هزینـه کردهـای غیرخـوراکی و افـزایش ۴۳ درصـدی هزینـه‌کردهـای خوراکی می‌شود. همچنین در نواحی روستایی نیز افزایش یک درصدی میزان تورم منجر به افزایش ۱۸ درصد هزینه‌کردهـای غیرخـوراکی و افـزایش ۲۲ درصـدی هزینـه‌کردهـای خـوراکی می‌شود. در کل بر اساس روش اثرات ثابت می‌تـوان گفـت کـه افزایش میزان تورم در جامعه افزایش هزینه‌هـا و مخـارج را در زمینه خوراکی و غیرخوراکی به دنبال دارد که این مقدار برای هزینه‌های خوراکی بیشتر بوده است.

درخصوص تغییرات سطح درآمد نیز نتایج به دست آمده بیانگر آن است که هرچقدر میزان تـورم بـالاتر باشـد میـزان درآمـد واقعی افراد به نسبت هزینه‌ها و مخارج روزمره‌شان کاهش پیدا

می‌کند. به عبارتی دیگر هرچه میـزان تـورم در سـطح جامعـه بالاتر باشد، قیمت‌ها نیز با افزایش تساعدی مواجه خواهد شد و افزایش دستمزدها در چنـین شـرایطی بـه معنـای افـزایش سطح رفاه در جامعه نیست.

**۵. بحث و نتیجه گیری**

تحـریم هـا طـی دهـه گذشـته چالش برانگیزتـرین بحـث در سیاست خارجی و روابط اقتصادی ایران بوده است. فراگیـری و درهم تنیدگی تحریم ها، ارکـان مختلـف سیاسـی و اقتصـادی کشور را درگیـر و رشـد اقتصـادی را بـا موانـع بسـیار مواجـه ساخت. عدم ورود کشور به جامعه بین الملل، بر افزایش تـورم در درآمدها و هزینه خانوارهـا تاثیرگـذار گردیـده و پیامـدهای منفی فراوانی را برای مردم به ویژه اقشـار محـروم بـه همـراه آورده است. به طورکلی تغییرات ناگهانی ناشی از سیاست‌های مـالی و پـولی و افـزایش تـورم بـر میـزان هزینـه و درآمـد و همچنین مقدار مصرف خانوارها در مناطق شـهری و روسـتایی تاثیر بسزایی دارد. درواقـع هرچـه میـزان تـورم بیشـتر باشـد، هزینه‌ها افزایش یافته و قدرت خرید به شدت کاهش می‌بایـد. بر اساس یافته‌ها می‌توان گفت که تـاثیرات تـورمی بـر نـواحی شهری بیشتر و سریعتر از نواحی روستایی اثر خـود را برجـای می‌گذارد و در این راستا فقرای روستایی که تعداد بیشـتری از جامعه روستایی را تشکیل می‌دهند، متضرر می‌شوند.

**کلیـدواژه‌ها:** هزینـه و درآمـد، نـواحی شـهری و روسـتایی، سیاست‌های اقتصادی، تورم، STATA.

**تشکر و قدردانی**