

## Targeted Effects of Subsidies on Prices of Selected Commodities

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**Abstract:** Subsidies in recent years as a general and comprehensive due to pressure on government budgets on the one hand and the enjoyment of all households from subsidies on the other hand, forced governments to move toward subsidies targeted to avoid wasting resources and increasing the coverage of government payments. The issue in Iran in past years been targeted, so that in January 2010 the subsidies that had been sanctioned by the government were to implement. Now, after more than a year of implementation of this Act, be considered to evaluate the effects of its implementation as necessary. The law implementation has different effects, that examine of effects is extensive and time consuming and it is not possible to analysis comprehensively in this report. The present report focuses on the effects of subsidies targeted on prices of selected commodities.

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### 1. Introduction

Subsidies in recent years as a general and comprehensive due to pressure on government budgets on the one hand and the enjoyment of all households from subsidies on the other hand, forced governments to move toward subsidies targeted to avoid wasting resources and increasing the coverage of government payments (Weinhagen, 2002). The issue in Iran in past years been targeted, so that in January 2010 the subsidies that had been sanctioned by the government were to implement. Now, after more than a year of implementation of this Act, be considered to evaluate the effects of its implementation as necessary. The law implementation has different effects, that examine of effects is extensive and time consuming and it's not possible to analysis comprehensively in this report. The present report focuses on the effects of subsidies targeted on prices of selected commodities.

The present study sought to question the increase in commodity prices (selected) after the implementation of subsidies targeted, by the extent impact of this law implementation. Hence the present report is devoted to answering this question (Tavakoli et al., 1999).

To answer this question, increasing prices of selected commodities after targeting considered two foreign origin and targeted law enforcement and its tried to focus on existing theories of price increases and the transmission and the transmission of inflation on one hand, Econometric methods and techniques on the other hand, the question will be answered in the form of an econometric model. To facilitate this transfer avoided of technical detail and complexity of methods and the report focused on the results analysis.

Therefore, after the introduction theories of price transfer are presented. In the third part done studies presented and in the next section, the model, its estimates and the analysis results is presented.

Studies and researches conducted in other countries shows that price transmission mechanism can be analyzed in two ways:

I) Different stages of the transfer price of foreign markets to domestic markets and ultimately to the consumer price index (CPI).

II) Price transmission in various stages of production through the transfer of production cost in different stages and finally transfers it to the consumer price index (CPI).

#### 2-1- Price transmission of foreign markets

Often the consumer price index will be affected by two factors, domestic inflation and inflation of imported goods (Poole, 2006). For the transmission of foreign price inflation to domestic prices, there are various channels. The two main channels for the transfer are goods and capital markets, which for small economies such as Iran's economy because there isn't a developed capital market, most transmission occurs through the goods market. Most of the changes in exchange rates and prices of foreign goods on the goods that it produces a higher share of foreign raw materials, that is also called foreign resources cost. Accordingly any dependence on the production of imported goods is higher than the effectiveness of exchange rate volatility. When producers are faced with rising production costs, usually transfer the pressure to consumers by increasing goods prices and final services to keep their previous level of profits. But this transfer is done slowly and over time that is the price adjustment process may not happen

immediately. In the cases both indexes may move almost simultaneously. In a supply-side shock as increasing of energy prices, has the immediate effect on both consumer price indexes (CPI) and producer price index (PPI). Consumer prices at different intervals depending on the agency's pricing strategy and market conditions are adjusted. Therefore the relationship between CPI and PPI depends on determine behavior of producer's added cost and degree of market competition and demand common conditions (Bhundia, 2002).

Producer and consumer price indices often are known as prices of goods throughout the production chain. Consumer prices are final goods prices that are sold to consumers. Producer prices are as the prices of goods "data" that is used to produce final goods. That is raw materials as the data used to produce intermediate materials and intermediate materials as the data used to produce the final goods. With this PPI simple approach for raw materials, intermediate goods and final goods throughout the distribution chain are linked together. Economic reasons also imply on existing relationship between the prices of various goods throughout the production chain. In theory, an agency with price surcharge is set to earn more than the cost of production. Of course this price transmission is usually associated with the interruption. One reason for the delay, are the contracts that is closed between agencies at different stages of production (Laflech, 2009). Another important point is that the producing cost not only depends on the cost of raw materials as "data", but also work factors, capital and the interest is also effective on production costs. Efficiency for industrial that uses labor as the main data and technology progress means efficiency for capital industry are important factors that are effective on production costs. Labor factors and capital effects on production, May compensate cost of raw material price increases. For example, if the price of raw materials increased as a percentage, labor efficiency will cause to only 5/0 percent increase in the price of goods (Buddhari and chensavasdijai, (2010). The productivity also can interpret that. Thus, economic theories suggest that producer prices are predicted consumer prices. On the other hand the accuracy of CPI and PPI data structure and other economic reasons explain that the relationship between these two parameters may be weak.

## 2. Material and Methods

Jo Nathan Weinhagen (2002) studied price transmission mechanism at different stages of production up to the consumer price index (CPI). In this study a four-variable Vector Auto Regression model including indicators of producing raw materials, intermediate goods and final goods and the

consumer price index is used. Results indicate that from 1974 to 1989 the prices of raw materials, intermediate and final transfer to CPI, but from 1990 to 2001 the only change in the producer price index for final goods cause changes in the Consumer Price Index (CPI).

Ministry of Agriculture in 1999 in England investigated the issue of price transmission mechanism at the retail level for the meat market. The results using the VAR model and considering the series of wholesale prices, retail sales and producer for each of meat products (pork, lamb and chicken) was done two to two forms, indicating that changes of meat price in primary markets transferred to retail market completely or as a significant through the production chain. This price transmission is usually done with a pause of several months.

Shams -e Fakhr (2009) has studied the relationship between price indices in Iran by using the econometric model and Vector Auto Regression (VAR) during the time period 1990-2007. Her results suggest that short-term and long-term the prices influencing trend is from PPI to other price indicators. In other words, inflation arising from cost production pressures is transmitted to other markets (wholesale and retail).

Muhaddes (2009) has examined the interaction effects between different price indexes. He used the Vector Auto Regression (VAR) pattern for his analysis. The literature review and explain the pattern, study results suggests that a momentum in the producer price index and wholesale price index after about 3 to 8 months penetrate to consumer price index and will cause to gradual increase of CPI. This effect after almost a year and a half reaches a constant number and the process continues.

Global index of producer prices is composed of energy and non-energy index. Non-energy index will be broken in two indices including foods and industrial inputs index.

For domestic prices has been used from price indexes producing by the Central Bank of Iran. These data include the producer price index, consumer price index, and in lower level are the commodity price index of food groups, bread, dairy, sugar and cube sugar, and clothing. All these indicators are monthly and cover the years 1991 to 2011. Global price index data is also monthly and the corresponding period of the domestic price index for the base year 2004 = 100 has replication. International price indexes from sources like the International Monetary Fund (IMF) and World Food Organization (FAO) have been obtained.

At first the relationship between the producer price index in Iran, and producer price index in the world are examined, And the question is answered

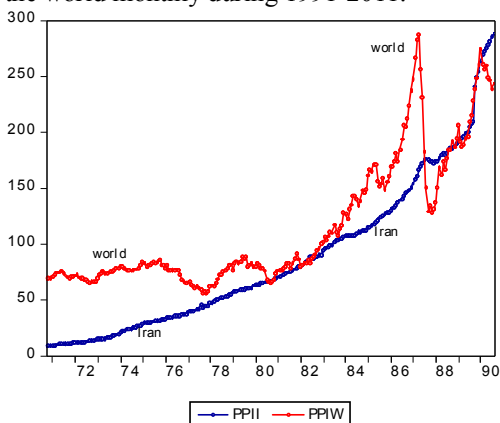
that whether there is communication between these two indices, while the effect of subsidies targeted by virtual variable enters to the model. Then the world price index has been analyzed and the connection between this index subsets and subsets of producer and consumer price index will be examined.

**3. Results**

In this section, we present and analyze results. This study has been conducted in five parts. First part is seeking the question is whether the world producer price index and it's subsets has the effect on Iran producer price index? The second part is about bread. The third and fourth parts respectively are about dairy products and sugar group. The final section has been allocated to investigate the effectiveness of domestic clothing price from world prices.

**4.1. Effects of world prices on domestic prices**

Graph 1 shows the producer price index in Iran and the world monthly during 1991-2011.



Graph 1: Producer Price Index in Iran and world during the years 1991- 2011

Given to the country's small economy in compared to the global economy and a low degree of openness of the economy of country, it is expected that the world prices is affecting domestic prices. Accordingly, to assess the effects of external prices on domestic prices, equation (1) is defined as follows.

$$\ln PPII = f(\ln PPIW, D8910) \quad [1]$$

Where:

$\ln PPII$  = Logarithm of the monthly index of producer prices in Iran (2004=100)

$\ln PPIW$  = Logarithm of the monthly index of producer prices in the world (2004=100)

$D8910$  = Virtual variable for the effects of targeted law enforcement that is zero for the months before January 2010 and after January 2010 get the number 1.

In the case of positive and significant in the global commodity price index it means the impact of world prices index on domestic prices. The results of

estimating model (1) in the long run, by using of Johansson method showed that the price index and virtual variables defined for targeted subsidies has positive and significant impact on the producer price index. Moreover, the effect of targeted subsidies (1/08) larger than the world prices (0/906) has been effective on the producer price index.

Now we estimate the relations of short-term foreign and domestic price index. Results obtained in the short term, also confirmed long-term results. It can be argued that the global price and targeted subsidies changes on the producer price index in Iran in the short term and long-term has been impact.

In order to separate the effects of universal and targeted price index on producer price index in Iran, the variance analysis has been made that the results are shown in Table 1. Based on the analysis of variance, the occurrence of a shock to the price index of producer prices in Iran in the first period after a year about 9 percent of shock by the producer price index variable in the world and about 5 percent of its targeted will be explained. Also, after a period of 24 months about 14 percent by the world price variable and 9 percent by the targeted policy is explained.

Table 1: Analysis of variance for model (1) the producer price total Index

period	$\ln PPII$	$\ln PPIW$	$dum8910$
1	100	0	0
12	86.56	8.73	4.69
24	76.39	14.31	9.28

Source: Research Computing

Now we will respond to the question whether the world price indexes "edibles and beverages," "industrial goods price index" and "energy price index" is effecting the producer price index in domestic or not?

To answer this question, we introduce equation (2) as the following:

$$\ln PPII = f(\ln FPIW, \ln IPIW, \ln EPIW, D8910) \quad [2]$$

Where:

$\ln PPII$  = Logarithm of the monthly index of producer prices in Iran (2004-100)

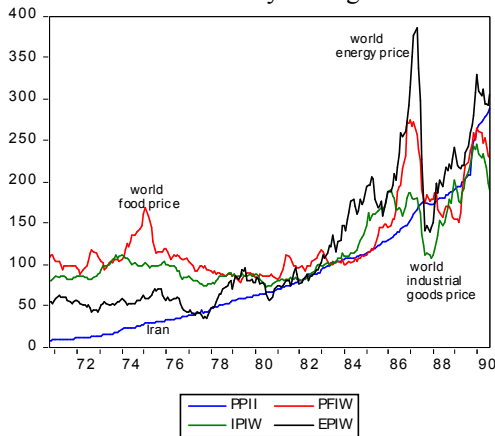
$\ln FPIW$  = Logarithm of the monthly price index for edibles and beverages in the world (2004-100)

$\ln IPIW$  = Logarithm of the monthly index of industrial commodity prices in world (2004=100)

$\ln EPIW$  = Logarithm of the monthly index price index in the world energy (2004=100)

$D8910$  = Virtual variable for the effects of targeted

law enforcement is for the months before January 2010 is zero and after January 2010 gets the number 1.



Graph 2: Producer Price Index in Iran, The edibles price index, industrial goods and energy in the world during the 1991 -2011

To estimate long-run model (2) as previously stated the Johansson method is used. The long-term results indicate that global edible price index is ineffective on producer price index, and a significant positive impact on industrial goods price index and finally the energy price index in the world, has negative impact of reductions on producer price index in Iran. Like the previous model, targeted subsidies have a positive impact on producer prices. In this equation, the price index for industrial goods (1/96) larger than the effect of targeted virtual variable (1/21) on the producer price index in Iran.

Estimated short-term relationships suggest that the global food and energy price index has positive and significant impact on producer price index in Iran, but industrial goods price index effect is positive but meaningless. Now we will respond to the issue of whether the consumer price index CPII in Iran, is causality of producer price index PPII in Iran or reverse? For this purpose we consider the following equation:

$$\ln PPII = f(\ln CPII) \quad \text{or} \quad \ln CPII = f(\ln PPII)$$

To answer this question the blocked Granger causality method has been used.

As can be seen the producer price index, is the causality of consumer price index in Iran, but there is no reverse relationship so we can consider the following model.

$$\ln CPII = f(\ln(FPIW, IPIW, EPIW), D8910) \quad [3]$$

It expresses the relationship between the global commodity price index and consumer price index in Iran. Long-term estimate results in table (2) and short-term estimate in the table (3) are presented.

Table 2: Estimation of long-term relationship model (3) consumer price total Index

Co-integration Test (Johansson)			
Possibility level	Maximum eigenvalue statistic	Possibility level	Statistics of effect
0.0	24.15	0.0	40.17
Independent variables			Dependent variable
$\ln EPIW$	$\ln IPIW$	$\ln FPIW$	$\ln CPII$
0.91- (0.44)	1.14 (2)	1.27 (1.68)	1

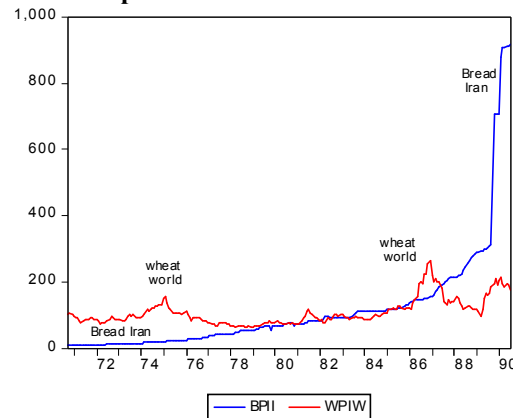
Table 3: Estimation of consumer price total Index short-term relationship model (3)

variable	Coefficients
$D \ln CPII$	1
$\epsilon_{t-1}$	-0.002 (0.0003)
$D \ln CPII(-1)$	0.34 (0.061)
$D \ln FPIW(-1)$	0.02 (0.01)
$D \ln IPIW(-1)$	0.021 (0.026)
$D \ln EPIW(-1)$	-0.003 (0.013)
$F - Test$	14.53
$RSS$	0.032

Source: Research Computing

The results of estimating model (3) express the relationship between the consumer price index to a period before.

#### 4.2. Studying the Effects of global wheat prices on the domestic price of bread



Graph 3: bread Price Index in Iran and wheat price index in the world during 1991 – 2011

For the analysis of the global wheat prices index effects on domestic bread price index and targeted virtual variable, equation (4) is introduced as follows:

$$\ln BPII = f(\ln WPIW, D8910) \quad [4]$$

Where:

$\ln BPII$  = Logarithm of the monthly index price of bread in Iran (2004=100)

$\ln WPIW$  = Logarithm of monthly indicators in world wheat prices (2004=100)

$D8910$  = Virtual variable definition for the effects of targeted law enforcement is the same as before.

Estimation results of long-term relationships global commodities price index with domestic bread price index through Johansson method confirm that there is no relationship between global wheat price index and bread price index. The price vector intended results are consistent with the reality of Iran's economy because before the implementation of targeted subsidies, subsidized prices for bakery flour used and hence world wheat price variable in long term was not associated with the price of bread. In addition, short-term results of model estimate affirm this subject. This means that the only targeted variable in the short term has been positive and significant impact on the price of bread.

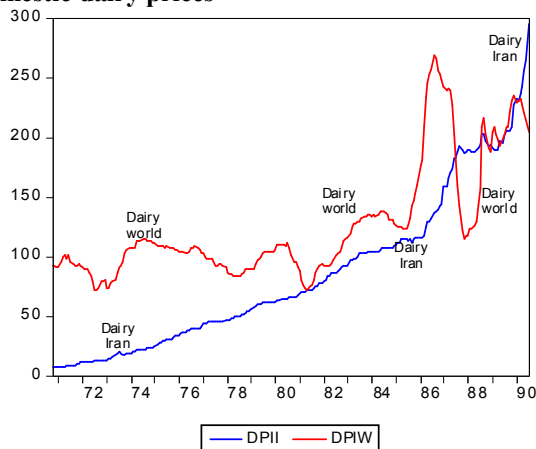
Table 4: Analysis of variance for bread price index, model (4)

Period	$\ln BPII$	$\ln WPIW$	$dum8910$
1	100	0	0
12	98.33	1.56	0.10
24	94.70	4.96	0.33

Source: Research Computing

Based on the analysis of variance, in the event of a price shock to the price index of bread in Iran in the first period of a year about 1/5 percent of shock will be explained by the world wheat price index variable, and about 0/1 percent will be explained by targeted.

### 4.3. Study of effects of world dairy prices on domestic dairy prices



Graph 4: dairy price index in Iran and world during 1991-2011

To obtain the relationship between the price index for dairy products and the factors influencing the price of dairy products in this study is used price index for dairy products in the world and targeted virtual variable.

$$\ln DPII = f(\ln DPIW, D8910) \quad [5]$$

Where:

$\ln DPII$  = Logarithm of the monthly index of producer prices for dairy products in Iran (2004=100)

$\ln DPIW$  = Logarithm of the monthly index of dairy prices in the world (2004=100)

$D8910$  = Virtual variable definition for the targeted law enforcement is the same as before.

Table 5: Estimation of long-term relationships dairy price index model (5)

Co-integration Test (Johansson)			
Possibility Level	Maximum eigenvalue statistic	Possibility Level	Statistics of effects
0.0	17.79	0.0	24.27
Independent variables		Dependent variable	
	$dum8910$	$\ln DPIW$	$\ln DPII$
	3.66 (0.88)	1.14 (0.04)	1

Source: Research Computing

Equation (5), which represents dairy price index in Iran and the world and also is targeted variable, shows the global dairy price index has a significant and positive relationship with the dairy prices index in Iran. Targeted subsidies could also lead to price increases in this area.

Table 6: Estimation of dairy price index short-term relationships model (5)

variable	Coefficients
$D \ln DPII$	1
$\varepsilon_{t-1}$	-0.008 (0.0009)
$D \ln DPII(-1)$	0.23 (0.06)
$D \ln DPIW(-1)$	0.011 (0.03)
$dum8910$	-0.018 (0.020)
$F - Test$	21.68
$RSS$	0.09

Source: Research Computing

Significant correction error coefficient is equal to 0/008. The coefficient indicates in case of an imbalance in dairy prices variable in Iran, what extent this imbalance will be lost that the obtained coefficients in this model represents the convergence



is slow. On the other hand the global prices variable in the short term will be on domestic price index, and also subsidies targeted given to fix dairy prices in the first year of implementation plan is meaningless.

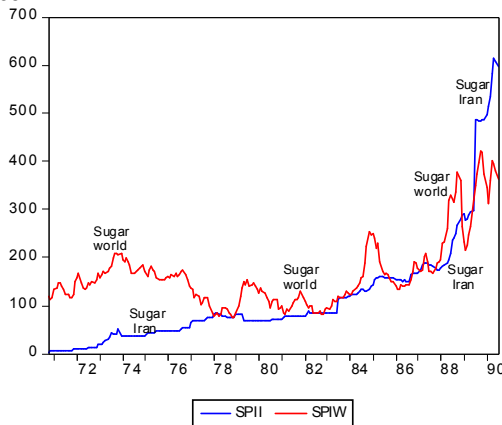
Table 7: Analysis of variance for the dairy price index model (5)

Period	ln <i>DPII</i>	ln <i>DPIW</i>	<i>dum8910</i>
1	100	0	0
12	67.92	6.89	5.26
24	28.77	14.29	9.95

Source: Research Computing

Based on the analysis of variance, in the event of a price shock to the dairy price index in Iran in the first period of a year about 7 percent of shock will be explained by the world dairy price index variable, and about 5 percent will be explained by targeted. Also, after a period of 24 months, 14 percent by the global price variable of around 10 percent through targeted policy is explained.

#### 4.4. Effects of global sugar prices on the domestic price



Graph 5: Iran and the world sugar price index over the years 1991-2011

In relation (6) the impact of targeted subsidies in sugar commodity on price index of cube sugar and sugar will be examined.

$$\ln SPII = f(\ln SPIW, D8910) \quad [6]$$

Where:

ln *SPII* = Logarithm of the monthly index of producer prices for sugar in Iran (2004=100)

ln *SPIW* = Logarithm of the monthly index in the world sugar price (2004=100)

*D8910* = Virtual variable definition for the effects of targeted law enforcement is the same as before.

Table 8: Estimation of sugar price index long-term relationships model (6)

Co-integration Test (Johansson)			
Possibility Level	Maximum eigenvalue statistic	Possibility Level	Statistics of effects
0.0	17.79	0.0	24.27
Independent variables		Dependent variable	
	<i>dum8910</i>	ln <i>DPIW</i>	ln <i>DPII</i>
	3.66 (0.88)	1.14 (0.04)	1

Source: Research Computing

Given to the results of the estimation model, global sugar prices have significant and positive impact on the price index of domestic goods. Also targeted subsidies in the long run have no effect. But in the short term, the price index does not affect its domestic indices.

Table 9: Estimation of sugar price index short-term relationships, model (6)

Variable	Coefficients
<i>Dln SPII</i>	1
$\epsilon_{t-1}$	-0.00367 (0.0016)
<i>Dln SPII</i> (-1)	0.052 (0.06)
<i>Dln SPIW</i> (-1)	0.0547 (0.063)
<i>dum8910</i>	-0.011 (0.0238)
<i>F - Test</i>	2.32
<i>RSS</i>	0.02

Source: Research Computing

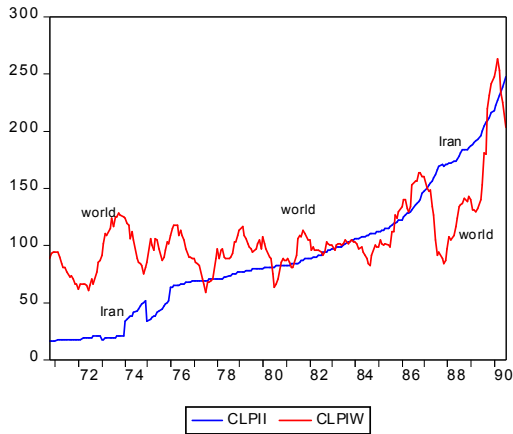
Based on the analysis of variance, in the event of a price shock to the sugar price index in Iran in the first period of a year about 7 percent of shock will be explained by the world sugar price index variable, and about 1 percent will be explained by targeted. Also, after a period of 24 months 14 percent by the global price variable of around 1 percent through targeted policy is explained.

Table 10: Analysis of variance for sugar price index model (6)

Period	ln <i>SPII</i>	ln <i>SPIW</i>	<i>dum8910</i>
1	100	0	0
12	92.38	6.89	0.72
24	84.33	14.29	1.37

Source: Research Computing

#### 4.5. Effects of yarn and fabric prices on domestic prices of clothing



Graph 6: the price index for clothing in Iran and yarn and fabric prices index in world during 1991 -2011

Equation (7) that studies the relationship between global cotton price index to prepared clothing price index is considered.

$$\ln CLPII = f(\ln CLPIW, D8910) \quad [7]$$

Where:

$\ln CLPII$  = Logarithm of monthly producer price index for prepared clothing in Iran (2004=100)

$\ln CLPIW$  = Logarithm of monthly indicators in world cotton prices (2004=100)

$D8910$  = Virtual variable definition for the integrated law enforcement is the same as before.

Table 11: Estimation of clothing price index long-term relationships model (7)

Co-integration Test (Johansson)			
Possibility Level	Maximum eigenvalue statistic	Possibility Level	Statistics of effects
0.0	22.29	0.0	35.19
	Independent variable		Dependent variable
	$dum8910$	$\ln CLPIW$	$\ln CLPII$
	2.90- (4.33)	5.34 (2.09)	1

Table 12: Estimation of clothing price index short-term relationships model (7)

Variable	Coefficients
$D \ln CLPII$	1
$\varepsilon_{t-1}$	-0.0012 (0.0024)
$D \ln CLPII(-1)$	0.007(0.064)
$D \ln CLPIW(-1)$	-0.094 (0.046)
$dum8910$	-0.026 (0.0169)
$F - Test$	4.99
$RSS$	0.48

Source: Research Computing

In relation (7) that the relationship is between inside and outside apparel price index and targeted subsidies variable, is price index coefficients has positive and significant effect on its internal indices, and also effects between targeted variables and domestic apparel price index is negative. This proves to be imported clothing and world prices' impact on it.

Table 13: analysis of variance for the clothing price index model (7)

Period	$\ln CLPII$	$\ln CLPIW$	$dum8910$
1	100	0	0
12	76.03	18.69	5.26
24	46.38	43.66	9.95

Source: Research Computing

Based on the analysis of variance, in the event of a price shock to the apparel price index in Iran in the first period of a year about 19 percent of shock will be explained by the world yarn and fabric price index variable, and about 5 percent will be explained by targeted. Also, after a period of 24 months 14 percent by the global price variable of around ten percent through targeted policy is explained.

#### 4. Discussions

Subsidy paying due to pressure on the state budget one side and the enjoyment of all households from subsidies on the other hand, made governments to move subsidies targeted to avoid wasting resources and increasing the coverage of government payments. In Increasing prices of selected commodities after targeted two foreign origin and targeted law enforcement is considered and studies suggest that the price affecting process is from PPI to the other price indicators in short and long-term. In other words, inflationary arising from pressures of production cost transfer to the other markets (wholesale and retail) and or momentum in the producer price index and wholesale price index after about 3 to 8 months penetrate to the consumer price index and will cause to CPI gradually increase. This after almost a year and a half reach to a constant number and the process continues. World index of producer prices is composed of energy and non-energy index. Non-energy index is also broken into two edible and industrial inputs sub indices and the effect of producer prices its subsets in the world on producer price index in Iran shows that the study has been allocated to the effectiveness of domestic apparel price of world prices. World price index and virtual variables defined

for targeted subsidies has significant and positive impact on the producer price index. Moreover, the effect of targeted subsidies (1/08) larger than the world prices (0/906) has been effective on the producer price index. World price changes and targeted subsidies have been effective on producer price index in Iran, in short and long-term. The long-term results indicate that global food price index is ineffective on producer price index, the impact of industrial goods price index is positive and significant and ultimately the world energy price index has negative impact of reductions on producer price index in Iran. On the other hand, subsidies targeted have positive impact on producer prices. The effects of industrial goods price index (1/96) is larger than the virtual variable targeted (1/21) on the producer price index in Iran.

Estimate of short-term relationships suggest that the global food and energy price index has positive and significant effect on producer price index in Iran, and industrial goods price index effect is positive but meaningless. In the short term only targeted variable has been significant and positive impact on the price of bread. World prices of dairy products and dairy price index in Iran have a significant positive relationship. Targeted subsidies could also increase the price. On the other hand the global price variable in the short term is ineffective on domestic price index and also subsidies targeted due to fix dairy prices in the first year of implementation plan are meaningless. Also has positive and significant impact on the domestic price index for sugar. Also targeted subsidies in the long run have no effect. But in the short term, the world price index does not affect on its internal indices. The relationship is between price index for clothing in inside and outside and targeted subsidies variable. Price index coefficient for clothing has significant positive effect on its internal indices. Also influence between targeted variable and domestic apparel price index is negative. This proves to be imported clothing and world prices impact on it.

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