

Studying the impacts of stopping payments cash of subsidies to three household deciles in Iran on income distribution and production

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Abstract

In December 2010, Iran launched a five-year plan to reform the system of price subsidies. In the first stages of the plan, subsidies were partially cut by raising prices of fuel products and some other goods and services. The rise was several-fold in most of the cases. The net profits of the plan were then earmarked for financing the compensatory cash transfer plan that includes paying each Iranian citizen residing inside the country, around \$40-45 a month . However, Iranian government has currently a lot of problems in financing the cash subsidies.

Using social accounting matrix approach, the current paper tries to investigate the effects of implementing the first phase of Targeted Subsidies Act on income distribution in Iran. We also examined the impact of stopping payment of cash subsidies to three income deciles of the Iranian population and expending it in other sectors. Results showed that current form of cash subsidies will not help improve income distribution and it can even make it worse. Results also showed that compared with other scenarios, stopping payment of cash subsidies to three income deciles and expending it in agriculture sector can improve income distribution and leads to higher production level.

Keywords: Social Accounting Matrix, income distribution, targeted subsidies.

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1. Introduction

In March 2010, the Iranian parliament ratified the Targeted Subsidies Reform Act (henceforth the Reform Act) which called for a gradual increase of energy prices within a five-year period (2010–2015). According to the Act, the retail prices of petrol, diesel, fuel oil, kerosene and liquefied petroleum gas (LPG) should increase to no less than 90 per cent of Persian Gulf free on board (FOB) prices. Natural gas retail prices are also envisaged to increase to at least 75 per cent of average export prices after deducting transmission costs and export taxes. For electricity and water, the prices are set to increase to cover full cost price. The Reform Act also stipulates gradual elimination of subsidies for wheat, rice, cooking oil, milk, sugar, as well as postal, air and rail services within the same five-year time frame. In order to manage potential fuel price volatility in the future, the Reform Act has authorized the government to absorb up to 25 per cent of the FOB Persian Gulf price increases (relative to FOB Persian Gulf prices of 2010 when the Reform Act came into force) through further subsidization without changing the consumer price. Furthermore, its Note 3 of Article 2 envisages minimum and maximum revenue of IRR100 thousand billion and IRR200 thousand billion (approximately US\$10 and US\$20 billion) from price increases in the first year of implementing the reform plan.

To compensate the nation for higher energy prices, the law has authorized payments of a maximum of 50 per cent of the fiscal revenue, resulting from price increases to the population in the form of:

- In-cash and in-kind payments bearing in mind each family's level of income.
- Social security system, including introduction of national health insurance, job creation and house mortgage loans.

The Reform Act has also designated payment of a 30 per cent share of the income from price increases to support industries and producers through interest subsidies on loans for the adoption of new energy-saving technologies and credit lines to reduce the impact of higher energy costs on cash-flow. The remaining 20 per cent share has been allocated to government to cover its subsequent increases in costs and to improve its infrastructure.

Some of the Iranian government's reforms objectives were as following:

- Promoting standards of living
- Distributing the national wealth fairly and equally
- Minimizing income disparities
- Raising energy prices to international market level
- Increasing efficiency and preventing wasteful consumption
- Reducing fuel smuggling
- Allocating more energy resources to boost production
- Encouraging demand for domestically produced commodities

- Enhancing country's oil and gas export capacity.

Using social accounting matrix approach, the current paper investigates effects of implementing the first phase of Targeted Subsidies Act on income distribution in Iran. We also examine effects of stopping payment of cash subsidies to three income deciles and how it can be expended in other sectors.

The remainder of this paper is organized as following: The next section provides an evaluation of implementing the first phase of Targeted Subsidies Act. Section 3 describes data and research methodology. Section 4 describes results of research and finally, section 5 is dedicated to the conclusion.

2. Evaluation of implementing the first phase of Targeted Subsidies Act

In December 2010, Iranian government finally launched the five-year plan to reform its price subsidies system. In the first several stages, subsidies were partially cut by raising prices of fuel products and some other goods and services. The rise was several-fold in most of the cases. Contrary to the initial wording of the legislation, not only net proceeds of the plan were partly earmarked for financing a compensatory cash transfer that pays each Iranian citizen residing in the country around \$40-45 per month, but it also attracted about 50 percent more from public budget to finance the cash payments. Now, Iranian government is faced with huge difficulty continuing to implement the Act.

The Reform Act authorizes only in-cash and in-kind payment to families of a maximum 50 per cent of the revenues coming from price increases and the payment should be made based on the average income of the household. However, the Act neither establishes a criteria or a benchmark, on which one can evaluate the families' level of income, nor does it specify the exact amount of monthly payments. Therefore, the government, facing difficulties in identifying the target groups, announced that all Iranians living in the country were eligible to receive monthly cash payments of IRR455, 000 (around US\$45). In the first year of the plan, from December 2010 to December 2011, the cash payment to 73 million Iranians cost the government IRR3, 300 billion every month. Despite the government's revenue of around IRR300,000 billion from the price increases in the first year of implementing the plan, which far exceeded the total annual gain of IRR100,000-200,000 billion (US\$10–20 billion) as stipulated by the Act, the actual public cash payment in the corresponding year was approximately IRR400,000 billion ("Proponents and opponents," 2011). In order to cover the IRR100 thousand billion deficits, the government was forced to distribute its own shares of the income, namely the 30 per cent and 20 per cent allocated to the industry and the government, in addition to taking loans from the Iran's Central Bank. It also used tax revenues and the development funds of ministries of oil and energy ("Government's Violations," 2012).

Using social accounting matrix approach, the current paper tries to investigate the effects of implementing the first phase of “Targeted Subsidies” Act on income distribution in Iran. We also examined the impact of stopping payment of cash subsidies to three income deciles and expending it in other sector.

Evaluation of the first phase of the Targeted Subsidies Act shows that it has negatively impacted the production costs so that the implementation of the plan resulted in a significant growth in Producer Price Index. However, despite adopting the price control policies by the then government, the consumer price index has not been adjusted with the same speed. And, it was adjusted with a higher speed in the next periods.

However there are some facts about inflation that are the results of implementing the Targeted Subsidies Act:

1. One of the major challenges in implementing the energy price reform was managing its impact on inflation which was expected to rise due to the rising commodities’ prices and increasing liquidity as a result of monthly cash handouts. In October 2010, two months before the start of the reforms, the inflation rate was reported to be around 12 per cent (Central Bank of Iran, 2010). However, in January 2011, two months after the reforms, the inflation rate increased significantly, reaching 15.8 per cent and then 18 per cent in February (Central Bank of Iran, 2011).

2. Making a comparison of urban and rural inflation rates shows that before implementing the targeted subsidies act, the rate was the same in both places. However, as the deadline for implementation of the act approached, inflation rate went significantly higher in rural areas than compared to the cities. therefore considering the income gap between rural and urban areas, the implementation of this plan may even deteriorate income distribution.(Figure A4)

3. Studying the share of food expenditure in different income deciles shows that after implementation of the Act, this share has experienced an increase for all deciles. However this increasing is higher in upper deciles than the lower ones. (Figure A2)

4. Making a comparison of inflation rate and the growth in food price index rates shows that after implementation of the Act, the growth rate in food price index has gone higher than inflation. Given the fact that share of food expenditure in lower income deciles is higher than upper income deciles, implementation of the Act has resulted in welfare loss in lower income deciles. (Figure A3)

5. Since subsidies payment is continuous, share of subsidy payments on household expenditure has decreased. However, the point is that the decrease in the lower income deciles is higher than upper income deciles. (Figure A1)

The next section used social accounting matrix approach; we will make a theoretical investigation into the effect of equal cash payments on production and income distribution.

3. Methodology

Social Accounting Matrix (SAM) is a general equilibrium database which covers production activities, production factors and institutions (Defourny and Thorbecke, 1984). Pyatt and Round (1988) defined SAM as a general equilibrium database that represents economy and links social aspects to economic aspects of a country. Hartono and Resosudarmo (2008) argue that SAM is an important analyzing tool due to two reasons. First, multiplier coefficients in SAM could explain the impact of economic policy on the income distribution. Second, application of SAM model is relatively simple. Thus it can be applied on various countries. Another advantage of SAM is it can combine economic indicators and environment indicators in order to measure the relationship between economic activities and environment (Pal, Pohit, and Roy, 2011).

Table 1. SAM framework

		EXPENDITURE				TOTAL	
		Endogenous Accounts			Exogenous Account		
		Production Factors	Institutions	Production Activities			
R E C E I P T S	Endogenous Accounts	Production Factors	0	0	T_{13}	Z_1	y_1
		Institutions	T_{21}	T_{22}	0	Z_2	y_2
		Production Activities	0	T_{32}	T_{33}	Z_3	y_3
	Exogenous Account	T_{41}	T_{42}	T_{43}	Z_4	z	
TOTAL		y'_1	y'_2	y'_3	z'		

Source: Hartono and Resosudarmo (2008)

Table 1 shows the basic framework of SAM which is a 4 x 4 partition matrix. The row represents income, whereas the column represents expenditure. SAM has two main accounts, namely endogenous accounts and exogenous accounts. Endogenous accounts are divided into three blocks: production factors, institutions and production activities. Sub-matrix T_{ij} (or Z_i) shows the income of the account in row i from the account of column j . Vector y_i (or z) shows total income of all accounts and vector y'_j (or z') shows total income of all accounts. Total income

is equal to total expenditure for $i = j$ or in other words y_i must be equal to $y_i = y'_i$ (Hartono and Resosudarmo, 2008).

Coefficients of a multiplier matrix in SAM are important since it represents the total impact of changes in a particular sector on other sectors in the economy. In other words, it measures the impact of changes of the exogenous account on the endogenous account.

As previously mentioned in Defounry and Thorbecke (1984), a multiplier matrix can be written as:

$$y = Ay + x \Leftrightarrow y = (I - A)^{-1} x \Leftrightarrow y = M_a x$$

$M_a = (I - A)^{-1}$ can be called the matrix of accounting multipliers. These multipliers, when computed, can account for the results (e.g. income, consumption, etc.) obtained in the SAM without explaining the process that led to them. Let us now partition the matrix A in the following way.

$$A = \begin{pmatrix} 0 & 0 & A_{1.3} \\ A_{2.1} & A_{2.2} & 0 \\ 0 & A_{3.2} & A_{3.3} \end{pmatrix}$$

Given the accounts factors, household and the production activities, now we see that the income levels of these accounts (call them y_1 , y_2 , and y_3 respectively) are determined as functions of the exogenous demand of all other accounts. In this respect, what we have is a reduced-form model which can be consistent with a number of structural forms. This is quite satisfactory as far as tracing the effects of a certain injection in the economy is concerned or when the structural coefficients are more or less unchanged for prediction purposes.

One limitation of the accounting multiplier matrix M as derived in equation (2.2) is that it implies unitary expenditure elasticity (the prevailing average expenditure propensities in A are assumed to apply to any incremental injection). A more realistic alternative is to specify a matrix of marginal expenditure propensities (C_n below) corresponding to the observed income and expenditure that prices remain fixed.

Expressing the changes in income (dy) resulting from changes in injections (dx), one obtains,

$$dy_n = C_n dy_n + dx$$

$$dy_n = (I - C_n)^{-1} dx = M_c dx$$

M_c can be termed a fixed price multiplier matrix and its advantage is that it allows any non-negative income and expenditure elasticity to be reflected on in M_c . In particular, in exploring the macroeconomic effects of exogenous changes in the output of different product-cum-technologies on other macroeconomic variables, it would be very unrealistic to assume that consumers react to any given proportional change in their incomes through increasing expenditures on the different commodities by exactly that same proportion (i.e. assuming that the income elasticity of demand of the various socioeconomic household groups for the various commodities were all similar). Since the expenditure (income) elasticity is equal to the ratio of the marginal expenditure propensity (MEP_i) to the average expenditure propensity (AEP_i) for any given good, it follows that the marginal expenditure propensity can be readily obtained once the expenditure elasticity and the average expenditure propensities are known, i.e.,

$$Ey_i = \frac{MEP_i}{AEP_i}$$

Where Ey_i is the income elasticity for

$$MEP_i = Ey_i \times AEP_i$$

Thus, given the matrix A_{32} of average expenditure propensities, and the corresponding expenditure elasticity of demand, y_i the corresponding marginal expenditure propensities, matrix C_{32} could easily be derived. In this paper, expenditure elasticity of demand is calculated using extended linear expenditure system method.

One of the most recent social accounting matrixes of Iran, which was developed by the Iranian Parliament (Majlis) Research Center in 2006, is employed in the current study. This matrix is composed of 48- sectors. Thus, the year 2006, in which the matrix was initiated, is considered as the base year in the work.

4. Results

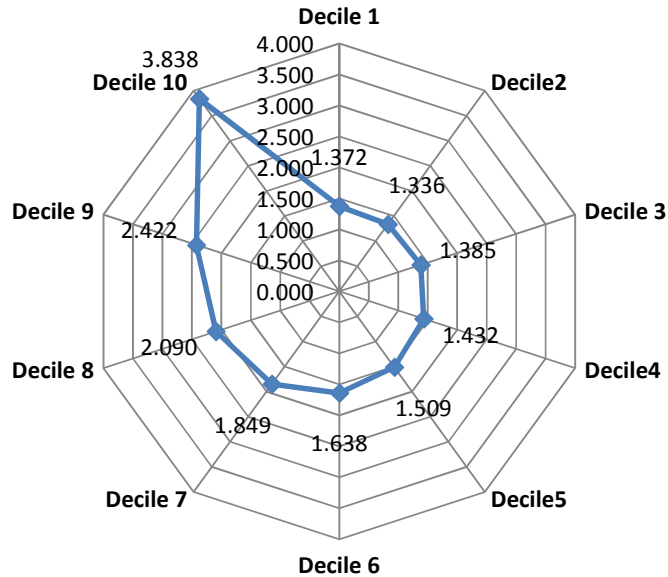
Using social accounting matrix approach, the current paper investigates the effects of implementing the first phase of Iran's Targeted Subsidies Act on income distribution in the country.

Results of fixed price multiplier approach have been shown in table 2 and figure 1. Table 2 shows that paying one unit of subsidy to all deciles increases 1.43 unit of income in decile one and 4.29 unit of income in decile 10. This means an increase in inequality. Therefore, results show that paying equal cash subsidies has an increasing effect on inequality in distribution of income.

Table 2. Effect of one unit of subsidy cash payment on income deciles

Decile	1	2	3	4	5	6	7	8	9	10
Change in Income	1.43	1.39	1.44	1.50	1.59	1.74	1.98	2.26	2.65	4.29

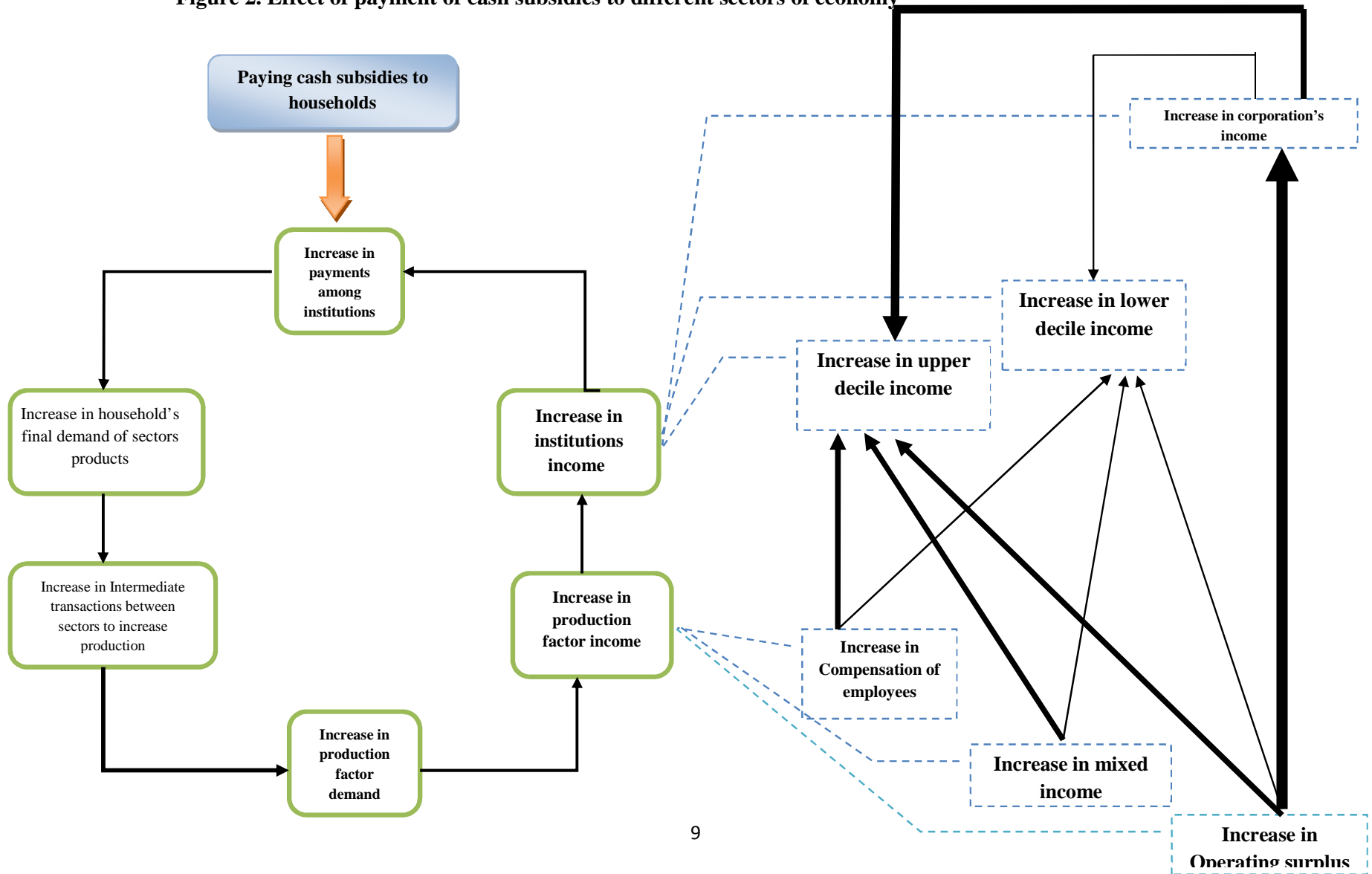
Figure 1. Effect of one unit of subsidy cash payment on income deciles.



The effect process of cash payment to different sectors of economy is shown in figure 2. It shows that cash payment of subsidies can lead to increases in payments to institutions, increases in household's final demand of sectors products, increase in the intermediate transactions between sectors to increase production, increase in production factor demand, increase in production factor income, increase in institutions income and, respectively.

It should be noted that in Figure 2, thicker lines are indicative of higher weight.

Figure 2. Effect of payment of cash subsidies to different sectors of economy



Results of past section of the paper showed that paying equal cash subsidies has an increasing effect on inequality in the distribution of income. Considering the increase in inequality on the one hand and the government budget deficit on the other, government has to stop paying cash subsidies of three household deciles.

In the next step, we investigate different scenarios to obtain the appropriate scenario for reaching the objective. The following four scenarios are considered:

1. Paying equal cash subsidies to all income deciles.
2. Stopping payment of cash subsidies to three income deciles and expending it in agriculture sector
3. Stopping payment of cash subsidies to three income deciles and expending it in industry sector
4. Stopping payment of cash subsidies to three income deciles and expending it in each sector based on its share of total output.

The overall results of the scenarios in Table 3 show the following results:

1. Worst scenarios for income distribution and production are paying equal cash to all income deciles.
2. Best scenario for income distribution is stopping payment of cash subsidies to three income deciles and expend it industry sector.
3. Best scenario for production is to stop payment of cash subsidies to three income deciles and expend it agriculture sector.

Table 3. Scenarios results

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Production	24.10	26.51	24.34	24.17
Households income	18.82	17.13	14.97	15.60
Ratio of the two up deciles to two down deciles	2.33	1.75	1.46	1.55
Ratio of Income change of 10th decile to Income change of first decile	2.82	2.31	1.93	2.04

5. Conclusion

In December 2010, Iran launched a five-year plan to reform the system of price subsidies. In the first stages of the plan, subsidies were partially cut by raising prices of fuel products and some other goods and services. The rise was several-fold in most of the cases. The net profits of the plan were then earmarked for financing the compensatory cash transfer plan that includes paying each Iranian citizen residing inside the country, around \$40-45 a month . However, Iranian

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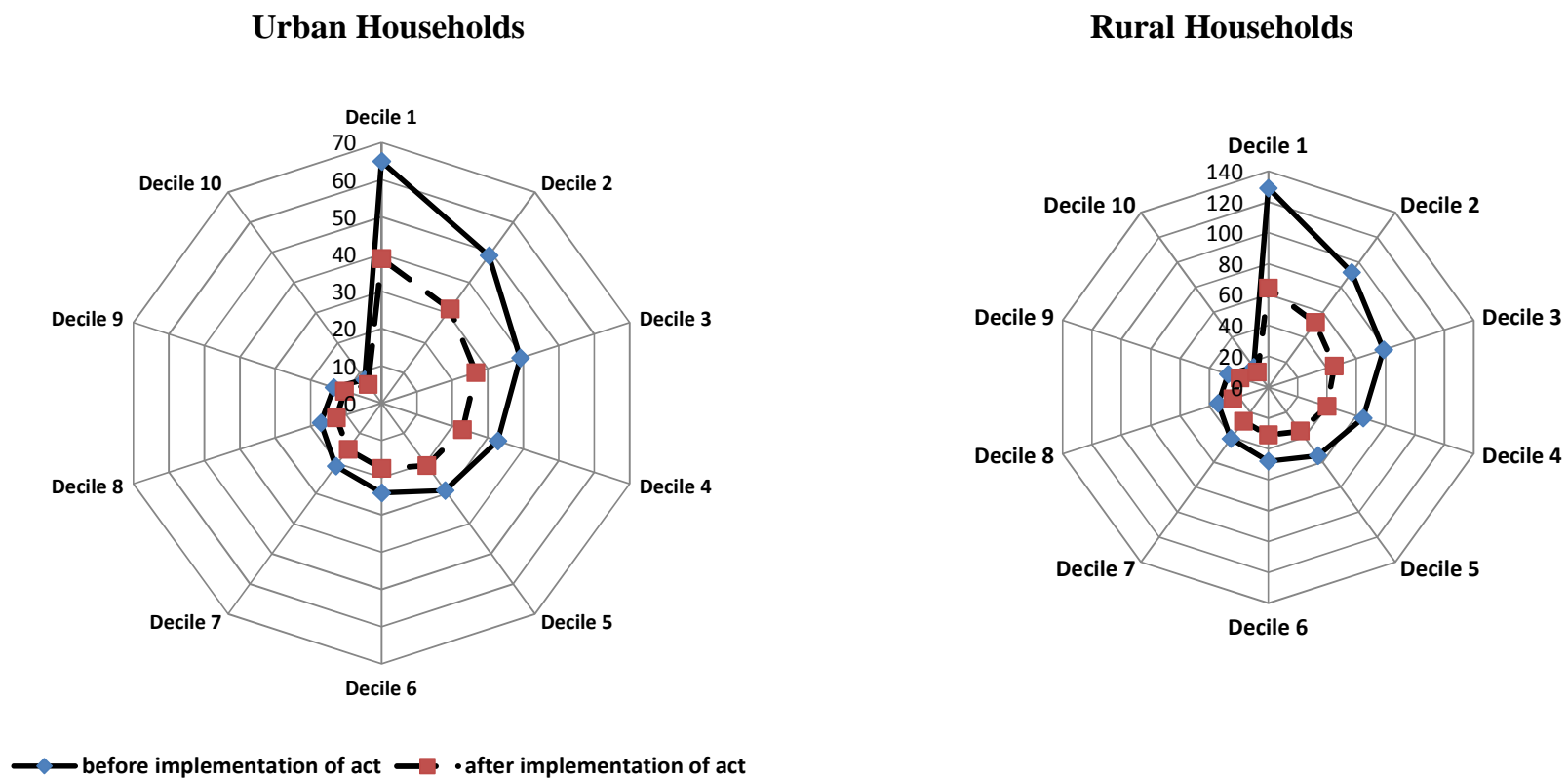
The Reform Act authorizes the government to only allocate a maximum of 50 per cent of the revenues emanating from price increase for cash payments to the households and the payments should be made based on the average income of the families. Thus the government can use the existing databases, including the Iranian national tax administration database and others, to fulfill the mission. Based on this, the government will be able to evaluate families' level of income and identify the target groups.

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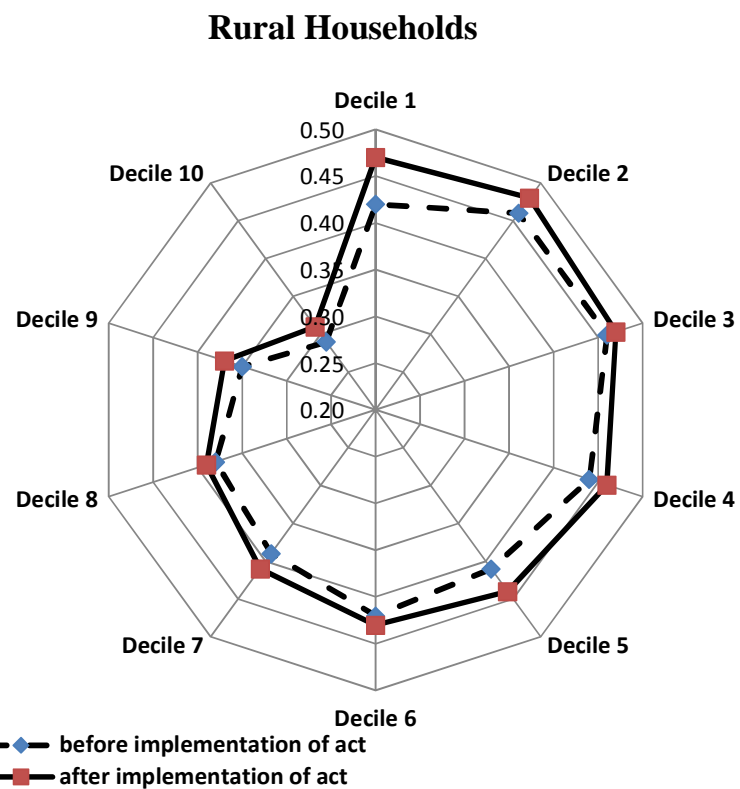
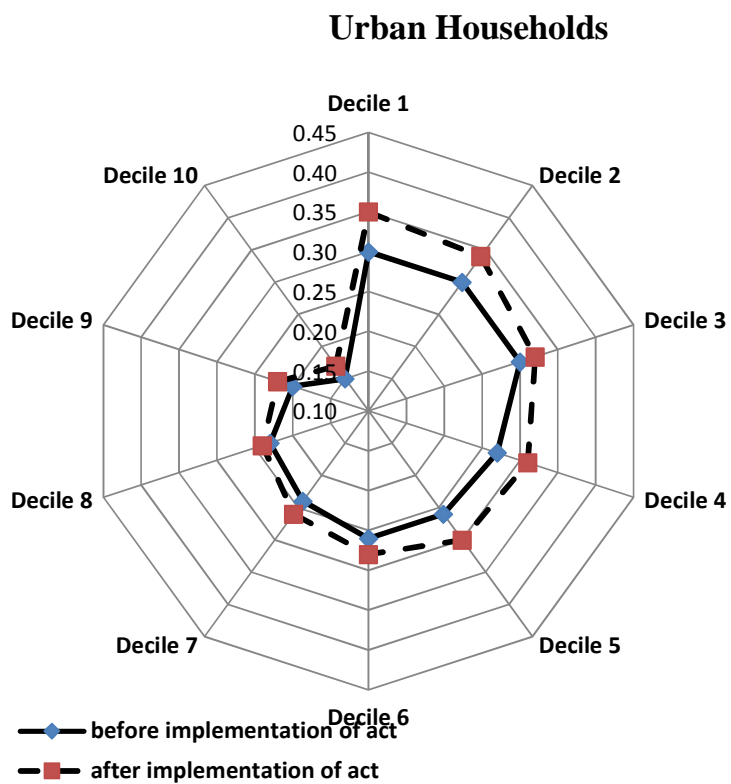
5. Appendix

Figure A1. Share of Subsidies Payment in rural and urban household budget



Resource: Statistical Centre of Iran <http://www.amar.org.ir/>.

Figure A2. Share of food price in rural and urban household budget



Reference. Statistical Centre of Iran <http://www.amar.org.ir/>.

Figure A3. Inflation and food price index growth time series

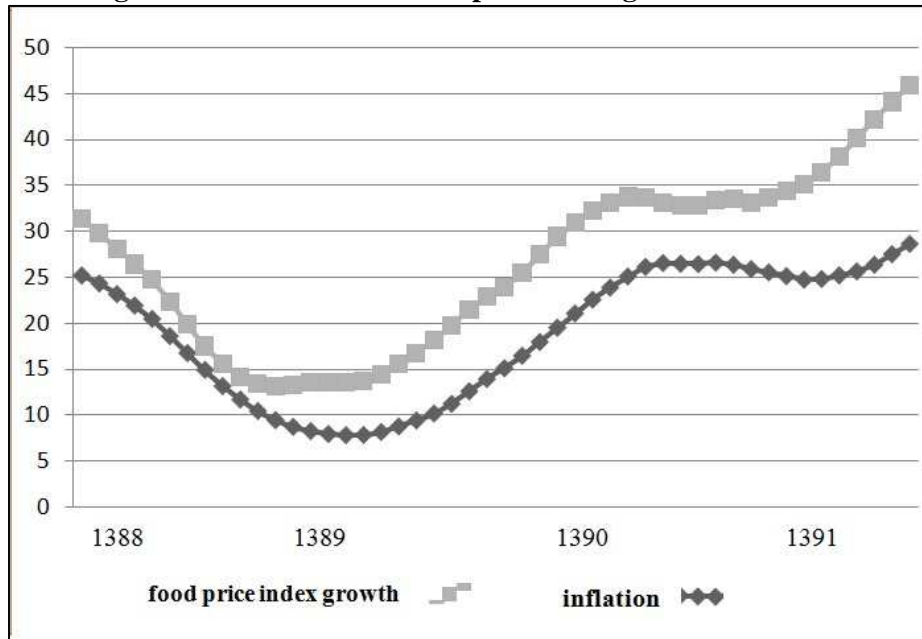
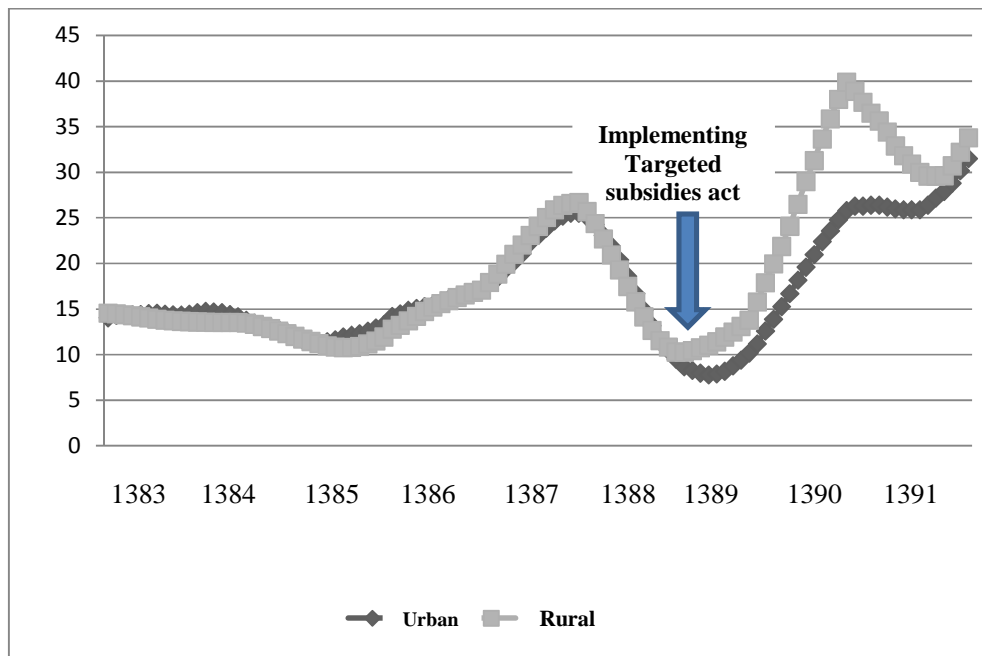


Figure A4. Urban and Rural inflation



Reference. Statistical Centre of Iran <http://www.amar.org.ir/>.