Do the Policies Always Have the Same Consequences? The Impact of Direct Income Support on Wheat Production: The Case of Turkey

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Abstract

Direct Income Support (DIS), viewed as the first phase of an agricultural reform process which fosters agricultural income and growth in a fiscally and economically sound and sustainable manner, can also have some undesirable impacts on agricultural and rural communities because the successful application of a policy in a country will not guarantee success in other countries due to structural differences. For that reason, a wheat supply response model was developed to evaluate the possible impact of DIS on Turkish agricultural sector and on the whole economy. It is estimated that production and agricultural income could decline which may cause social instability in the urban areas in the medium to long run unless complementary measures are taken.

Résumé

L'Aide Directe au Revenue (DIS), étant la première étape d'un processus de réforme agricole, peut avoir un impact négatif sur certaines communautés agricoles et rurales du fait que les politiques n'ont pas le même succès dans tous les pays à cause des différences structurales. Voilà pourquoi, on a mis au point un modèle de réponse à l'approvisionnement en blé afin d'évaluer l'impact du DIS sur l'agriculture turque et sur l'économie de ce pays. On a estimé que le revenue agricole pourrait baisser causant ainsi l'instabilité sociale en zone urbaine à moins qu'on ne prenne des mesures complémentaires.

1. Introduction

The Turkish Government launched an Agricultural Reform Implementation Program (ARIP) with the financial support of the World Bank, based on the Letter of Intent submitted to the International Money Fund (IMF) in 1999. ARIP is the base of the agricultural reform set forth in the program which was designed to produce "transition to a strong economy". This program indicated that support to agriculture accounts for 3% of the GDP, and therefore will be removed and replaced by a Direct Income Support (DIS) mechanism. It is underlined that agricultural policies applied by State Economic Enterprises (SEEs) distort the market price, cause income instability and stockpiles of some crops, put a burden on consumers and treasury and have a low transfer efficiency (Hazine Müste?arlı?ı, 2001; MARA, 2000). A need for a structural adjustment was first pointed out in the seventh Five-Year Development Plan, and it has been put in force with the technical and financial support of the World Bank, in accordance with the original letter of intent. Within this framework, the unsustainable and distorted system of subsidies for fertilizer, credit and price support, which disproportionately benefited large farmers and regressively taxed consumers, was abolished. In parallel to DIS, a simple, transparent and unified national program not distorting the intensive structure was introduced. Therefore, DIS was implemented on a pilot scale in 2000 and nationwide since 2001.

The most important reason for this reform program was the high fiscal burden of the agricultural subsidies and the current structure of agriculture with many small and fragmented agricultural holdings. Implementation of the program aims to reduce the financial burden in the short run. Long-run social and economic impacts were, however, not taken into account. Although farmer registration and the cadastral system could be considered as the success of the program, the agricultural sector still faces structural problems, which can not be avoided because it is evident that the successful application of a policy in a country does not guarantee the success in other countries due to the structural differences.

The aim of this paper is to discuss the possible social impacts of DIS by calculating the variation in production. The paper, however, does not intend to analyse the effect of DIS on producer or consumer surplus. In the study, key findings of the pilot application are examined, scenarios are developed based on a supply response model using wheat as a proxy for all agricultural production; the possible social costs of the implementation are calculated.

2. About Direct Income Support

Direct Income Support (DIS), developed from the basic principle of the economic theory that "price interventions would decrease welfare"(OECD, 1994), is applied to activate income generating potentials through income transfer to some groups and to re-orient income distribution. DIS is a direct payment to target groups that are not linked to production, input or income level. It is generally suggested for the purpose of liberalizing the global agricultural trade by mitigating the market distortions.

DIS is a tool applied in the transitional period to liberal-

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ize agricultural markets to replace market price supports and subsidies. Although DIS aims to increase the incomes of subsistence farmers, it is not designed to reduce poverty. As there is no intervention in the use of support, it is not an investment program either. Although the product prices will be lower as a result of DIS, it should not be considered as a leverage in agricultural development. Since the program depends on an asset –land, a considerable amount of the support payments will be captured by the large farmers. Perceiving DIS only in terms of income distribution or protection of small producers could not meet the objective of the program. DIS is a policy tool applied in agriculture, and should serve primarily for the purpose of agricultural development. Such an application may promote the growth of agricultural enterprises through the use of payments as operational capital. In case of owner's registration into the program, however, the tenant cannot receive the payments. Therefore, the program will hinder the equality of income distribution which is its principal purpose. DIS will favour the owner in terms of income distribution, and the landless will be forced to quit agriculture production. Since DIS cannot be based on any variable under the control of producers (except land), it is an essential point to determine whether the payments are to be made to the owner or the tenant. Regardless of who receives the payment, rent as the value of land and income will increase, and the owner of this non-flexible production factor will take advantage of DIS.

Government policies with the ultimate objective to provide income equalities may result in opposite effects, such as in Mexico. Should large and small farmers in terms of land size be supported at the same level? Inequalities in ownership will be reflected in the level of income support to the same proportion. Studies indicate that price supports benefit larger farms more than the small ones (Bayaner and Uzunlu, 1994). If the target group includes small farmers, then structural change in agriculture may not be possible. Support to small farmers will be a social program rather than an agricultural support program. If the larger farmers are to be supported, should the small farmers, which account for about 80 % of producers in Turkey, be excluded from such a program? Would excluding small farmers from the program bring about an increase in farms size? Would this be politically and economically the most desirable case? Will it succeed? Solutions to these questions should be the ultimate purpose in agricultural development, and are unlikely to be achieved through the application of DIS.

One of the important factors behind the implementation of DIS is its transparency. The payments create a budget burden about which the public might be well aware of. If the payments are financed by the consumers and taxpayers, this budget burden may put a pressure on the government. Therefore, agricultural support may need to be reduced. Should the cost of the program be borne by consumers or taxpayers if cost sharing is in question? The link between the objective-tools and beneficiary-payer should be well established (Kasnakoglu, 1999). Previously in Turkey, about 30% of the total support (US$ 2.5 to 3 billion) has been borne by the treasury while the remaining has been met by consumers through high prices. If the cost of DIS to treasury remains at the same level as applied in former policies, then direct income payments seems a better option.

Although DIS causes a burden on the budget, it is advocated that it promotes the development of rural areas more than other supports do, and increase employment in these areas. In case of termination of the program, labour flow is expected towards other sectors due to a subsequent decrease in agricultural income (Kilkinny, 1993). As a result migration would also substantially increase. An increase in unemployment is also expected which is already high in countries, like Turkey. This would eventually bring high social costs such as violence in cities, increasing crime rates, social and political disturbance (Stiglitz, 2002).

Undoubtedly, there are several criticisms of DIS. One of the widely pronounced is that it is implemented "to mask the intention of completely removing the agricultural support" (Özkaya et al., 2001). The policies mitigating the inequality in income distribution in terms of social aspects cannot be strongly advocated in economic terms. It is also argued that DIS is a transfer from the rich to the poor, and thereby, reduces total savings and investments, slows down the growth rate of GDP, and increases the unemployment rate. For example, DIS applied in Mexico had some unfavourable results. Since DIS is linked to land size and farms are small, payments to larger farms will be limited. This may reduce farm size and increase land fragmentation. In other words, it may lead large farms to establish smaller enterprises. It is highly possible that farmers may not take into account efficiency, competition and profitability in making production decisions. They may continue production only to receive the payments. In this case, DIS may not mitigate trade distortions or eliminate the regional differences.

Direct payments could increase producers' incomes and capital, and decrease the risks. As DIS is a transfer payment, it is expected that credit use would increase and this may provide an effective capital accumulation in agriculture, therefore increasing efficiency. Mexican PROCOMPO, however, proved that this was not the case (Sadoulet et al., 2001). While large farmers' demand for credit increased, demand for technology did not change as had been expected. While producers and consumers do not react to changes in market conditions or market signals generated by a price support, both will be sensitive to market signals in the case of DIS. Producers however, would not be highly sensitive in the countries where majority of producers are small and "market signals" may not mean much for small farmers, such as in Turkey.

3. DIS in Turkey

Launched as a pilot in four provinces in 2000, the payments were set at 50 Million TL (approximately US$ 50) per hectare for land areas of up to 20 hectares, and the implementation was extended to the whole country in the year 2001 and onward. At the same time, government phased out the unsustainable and distorted system of subsidies for all inputs. In 2002, both the quantity of land eligible for payment and the amount of the payments were increased. Per hectare payment was approximately 130 Million TL (approximately US$ 100), and payments were only made for land areas up to 50 hectares.

DIS in Turkey falls within minimum income guaranteed payments. It should be considered that those provided with direct payments have to feed the rest of the population. Since 80 % of those receiving DIS are small-sized farms, they do not intend or endeavour to earn a higher income from agriculture, nor do they intend to feed others, except those in intensive farming. From this point of view, DIS may not be an application to ensure agricultural development. DIS may not be a useful tool to alleviate agricultural development.

Supporting producers through income transfer is reasonable in the case of low agricultural income. The adequacy of the application, its possible impact and the structure of the agriculture after the project implementation however are not questioned. Would the same level of support to all farmers without taking into account regional differences be appropriate? Should regional differences be considered? How would the less developed regions benefit from the application, and how would this affect agricultural development? Although excluding developed regions from the support may seem fair in terms of income distribution, would this mean a backward step in terms of agriculture? DIS in less developed regions would be a social program in nature and may not meet the agricultural objectives.

It has been observed that farmers owning land above the payment limit imposed by DIS, divided the land among their relatives in order to benefit from payments for all of the land concerned. For this reason, the number of enterprises performing actual production is not known (Aydogus, 1999; Gençler and Artukoglu, 2003).

All regions and products are granted the same amount of payments, whereas the efficiency and other differences among various regions are not considered. For example greenhouses requiring intensive input use and field crop production were put in the same category and, therefore, received the same amount of payment. Because share of payment in total agricultural income was low, most small farmers did not apply for the payments. The most important factor to farmers in applying for the payments was that the payments were made without provisions and in cash (Gençler and Artukoglu, 2003).

At this point, it is important to understand how the structure of agriculture will change after the implementation of DIS. A supply response model for wheat was developed to estimate the change in the production. Wheat was selected since it is the single most important crop in terms of production and consumption in Turkey.

3.1. Some Findings from the Pilot Applications

Removing all the subsidies, taking the current level of technology constant, the cost of production would increase by 3.39% for wheat, 3.85% for barley, 2.40% for onion, 2.14% for sugar beet, 0.87% for water melon, 0.86% for melon and 0.56% for sunflower. In other words, the unit cost of these products will increase between 0.56% and 3.85% (Bayaner et al, 2001).

The average annual income per household in the pilot regions is minimum 2.25 billion TL (in Adıyaman) and maximum 3.72 billion TL (in Polatlı). The share of agricultural income in the total households income ranges between 54 % in Trabzon and 80 % in Adıyaman - two of the pilot provinces. DIS payment accounts for 2.9 % of household income in Trabzon and 9.5 % in Adıyaman.

About 55 % of the average annual labour force was idle in the pilot province Adiyaman. The literacy rate was 70 % in Adiyaman with 51.4 % of the labour force having graduated from primary school. Owner farms account for 71.6 % of agricultural income in the province. The most important crops in terms of agricultural income is tobacco, wheat, and barley. Tobacco accounts for 49.4% of agricultural income, wheat 24% and barley 6.7 %. Removing the subsidies, along with the tobacco production quota and the decrease in the domestic prices to match the world price level would considerably decrease household incomes in Adıyaman (Bayaner et al, 2001).

As a result, households would seek to earn income outside agriculture, and it would result in excess labour. Increases in the labour supply (at least for the short term) would decrease the wage levels in the area where DIS applied. The limited employment opportunities in the region would force less educated, less skilled and unskilled labour to migrate to urban areas.

DIS could not compensate the income loss of small vegetable and fruit producers, in that, greenhouses operate on 1.5-2 decare of land in Silifke, Erdemli and Aydıncık districts of Içel. Because the most important cost items in vegetable production in greenhouse are fertilizers, pesticides, heating and seeds, removing the input subsidies would considerably increase the cost of production which DIS can not compensate for (Bayaner et al, 2001).

It is important to determine how farmers use DIS in drawing conclusions about the implementation of the policy. Approximately about 52 % of the DIS in Trabzon and 90 % in Polatlı were used in agricultural production. The remaining were spent on other needs of the families concerned. Therefore, DIS did not contribute to capital accumulation, nor did it have any effect on the credit requirements of the producers.

Although there are some questions about the implementation of DIS, it has also accomplished some objectives it set forth to. For example, the Farmer Registry System that previously did not exist was introduced. Also the Land Cadastral System, an important tool to control agricultural production and in the implementation of support policies, was launched.

4. Wheat in Turkey

Wheat is sown in all regions of the country and accounts for 50 % of the total cultivated area (Table 1). Therefore, wheat production can be used to reflect the level of technology use in the agri-

cultural sector. As the majority of the agricultural population is involved in wheat production, it may also reflects the behaviour of the producers.

While wheat was sown on 7,700,00 hectares in 1960, this reached 9,400,000 hectares in 2004, with an increase of 22%. The ratio of the area sown in wheat to the total cultivated area has however, not changed. Productivity has steadily increased until the1980s and has since remained stable.

Wheat derivatives (macaroni, semolina, biscuits, and flour) are important products in the Turkish diet. Bread consumption is high in Turkey, with the poor obtaining about 50% of their protein from it. Macaroni is an important export product. Bran and wheat are also used as animal feed.

Wheat is also an important product in foreign markets. According to FAS (Foreign Agricultural Service of the Ministry of Agriculture of the United States of America), the import volume of core countries – Latin America, the Middle East, South-East Asia and Pacific Coasts (except China, India, Russia and Soviet Republics) will reach 1 10 million tons in 2007. It is mainly America, the EU, and Australia that are competing in the wheat market (US Grain Council, 1999). Although the land allocated to cereal production in EU-9 during the period from 1967 to 1997 decreased by 7 %, the area devoted to wheat production increased by 2.4 million hectares in the same period. In 1999 wheat was grown on 17.5 million hectares in EU-15 (Vital, 2000). Due to its importance in production, consumption, and trade, wheat was chosen as a proxy for agricultural production in this research.

5. Model and data

A Nerlovian-type supply response model (Nerlove, 1957) is used in the analysis, with modifications based on the model of Askari and Cummings (1977), where production as the dependent variable is used to estimate the production function for wheat.

The data covers the 1968-1999 period. Because the DIS system launched as a pilot in four provinces in 2000, the year 1999 is taken as a break point. By that way the influences of DIS are purified from the analysis.

Table 1 *Area Sown in Wheat (Hectare)*

Years	Total Area Sown	Wheat Area Sown	% wheat	Yield (kg)
1960	15,305	7,700	50.3	1097
1965	15,294	7,900	51.6	1076
1970	15,591	8,600	55.2	1163
1975	16,241	9,250	56.9	1595
1980	16,372	9,020	55.1	1829
1985	17,908	9,350	52.2	1818
1990	18,868	9,450	50.1	2116
1991	18,776	9,630	51.3	2118
1992	18,811	9,600	51.0	2010
1993	18,940	9,800	51.7	2143
1994	18,641	9,800	52.5	1786
1995	18,464	9,400	50.9	1915
1996	18,635	9,350	50.1	1979
1997	18,605	9,340	50.2	1997
1998	18,748	9,400	50.1	2234
1999	18,110	9,380	51.8	1941
2000	17,848	9,400	52.6	2293
2001	17,733	9,350	52.7	2077
2002	17,764	9,300	52.3	2101

Source: SIS, Agricultural Indicators 1999, MARA, 2003 .

Production is determined by variables including capital, product price, inputs prices, prices of other products, and climate. When only prices are used, the results obtained are statistically insignificant. Studies of several countries indicate that prices do not have immediate and direct impact on agricultural production (Mundlack et al, 1998). Furthermore, small scale producers do not take into account such price signals. Therefore, we have used gross revenue as an independent variable in the model. The fact that producers attach high importance to gross revenue rather than product prices is not surprising when relatively low income levels are considered in agriculture (Bayaner, 1996; Koç et al, 2001).

In addition to revenues, there are several other variables of importance in determining the production of a crop such as climate, irrigation, seed quality, pest and disease control. Although physical and natural conditions play an important role in production, they have not been taken into account in many studies particularly those which employ time series methodology, due to the fact that changes in basic nature are temporary (Mundlack et al, 1998). Data on pests, disease and irrigation are not available. As a result, these variables are not included in the model.

The type of nitrogen fertilizer most intensively used in wheat production consists of 33 % N ammonium nitrate and 21 % N ammonium sulphate. D-ammonium phosphate (DAP) which contains nitrogen, phosphorus and potassium, playing an essential role in plant cultivation is widely used. The amount of fertilizers used was obtained from the catalogue of Fertilizer Statistics and data from the Ministry of Agriculture, with the deflated net prices (after the subsidies are subtracted) paid by the producers being used in the study.

The number of harvesters were included in the model as a proxy for the capital and level of technology. The number of tractors is generally used in supply response studies as an indicator for the level of technology and capital, however, including tractors in the model did not result in significant statistics since they are also used in several other areas in Turkey. The number of harvesters multiplied by the deflated diesel price is included in the model. The model to be estimated is as follows.

$$Q_1 = a_1 + a_2 BG_{t-1} + a_3 Fertilizer_t + a_4 Mech_t + u_t \quad (1)$$

$$BG_{t-1}^{wheat} = (Q_{t-1}^{wheat} / Decar_{t-1}) * P_{t-1}^{wheat} \quad (2)$$

$$Fertilizer_t = ((Q_t^{as} * P_t^{as}) + (Q_t^{an} * P_t^{an}) + (Q_t^{dap} * P_t^{dap})) / Q_t^{as} + Q_t^{an} + Q_t^{dap} \quad (3)$$

$$Mech_t = Harvester_t * P_t^{diesel} \quad (4)$$

where;

Q_t = Total wheat production at time t.

BG_{t-1} = The gross revenue from wheat production per decare at time t-1.

P_{t-1}^{wheat} = The average deflated wheat price received by farmers t-1.

Q_t^{as} = The amount of ammonium sulphate that has been used in the production of wheat per decare at time t.

Q_t^{an} = The amount of ammonium nitrate that has been used in the production of wheat per hectare at time t.

Q_t^{dap} = The amount of d-ammonium phosphate that has been used in the production of wheat per hectare at time t.

$P_t^{dap,an,as}$ = The price of nitrate, sulphate and phosphate that the producer has paid at time t.

$Harvester_t$ = The number of harvesters at time t.

P_t^{diesel} = deflated diesel price at time t.

6. Results and discussions

Table 2. *Regression Results*

Dependent variabl	Quantity of Wheat Production
Variables	**Coefficients**
Constant	18.92 (34.74)*
BG t-1	0.30 (2.55)**
Fertilizer	-0.18 (-2.89)*
Mech	0.30 (5.44)*
Statistics	
R2	0.75
Adj.R2	0.72
F-test	26.06
D-W	1.83

Figures in the parentheses are t values
* significant at 1% level,** significant at 5% level

All variables are used in natural logarithm form. The Augmented Dickey Fuller (ADF) test indicates that the series are stationary at level[1]. The study covers the period from 1968 to 1998. The model is estimated by using Least Squares Method. Results are presented in Table 2.

$Q_t = 18.91 + 0.30\ BG_{t-1} - 0.19\ Fertlizer_t + 0.30\ Mech_t$

(0.55) (0.13) (0.06) (0.06)

t = (37.74) (2.55) (-2.89) (5.44)

The figures in parenthesis are the standard errors. The parameters are significant at 5 % level. The F value is statistically significant at 5 % level, therefore the production depends on gross revenue, fertilizer and mechanization. Durbin-Watson test indicates that there is no autocorrelation. R^2 is 0.72 meaning that about 72 % of the variation in production is explained by explanatory variables.

The coefficient for the gross revenue is 0.30, consistent with the expectations, and statistically significant. The sign of the coefficient is also as expected. The estimated coefficient for the input prices is considerably low. This indicates that farmers are well aware of the importance of fertilizer use. Once the production decision is made, in order to sustain the productivity level, farmers apply fertilizer regardless of its price. The effect of agricultural capital and technology is also low. Although the technology has a cost to farmers (e.g. diesel costs and repair and maintenance), it has a positive effect on production.

ARIP has been implemented since 2001 as part of the Economic Program. Strategic objectives, principles, and priorities of agricultural policies to be implemented after the ARIP are set forth in the agricultural policy paper: 2006-2010 (MARA, 2005). Therefore, wheat production is forecasted for the years 2006 to 2008, using the production function estimated and assuming that DIS will be implemented until the end of 2005. No restrictions are foreseen except product specifications in wheat import. Average factory delivery price was taken as the price to be received by the producers. Since processing industry prefers imported wheat due to its lower price and the quality, it is assumed that domestic prices will be lower, too. In the forecast, average wheat futures prices for 2006 to 2008 are used (www.fabri.org, 2004). The average prices used are; US$ 134,95 per metric tonne-bulk FOB American ports for American originated wheat, and US$ 122,16 per metric tonne -bulk FOB European ports for European originated wheat. Factory prices are calculated by adding 1 % VAT, handling, storage, and domestic transportation costs to the CIF prices.

[1] The test results for Q, BG, Fertilizer and Mech are -3.317164,-3.833568, -3.278451and -3.726784 respectively with critical values of 1% (4.3226), 5%(-3.5796) and 10%(-3.2239) respectively with a trend and intercept.

Six scenarios were developed. Prices based on these scenarios have been calculated (Table 3). The prices are in USD. The current exchange rate was used. Prices vary in the range of US$ 140 to US$ 238.

The deflated average 2002 fertilizer sale prices of Tugsas(a fertilizer producer) were used, assuming that the same series will continue on a consistent basis. The last ten years average of fertilizer quantities are used in the forecast, assuming a low fertilizer price elasticity (Sener and Koç, 1999). Regarding the wheat yield, no change in climate is assumed, and it is assumed that the average of the last ten years' yield level will be sustained. It is also assumed that the trend in technology use will be the average of the last ten years. Based on these assumptions, wheat production are forecasted and the results are presented in Table 4.

A considerable decrease in wheat production was observed, as seen in Table 4, after the implementation of DIS is removed. This decrease in production will be in the range of 1 to 3,8 million metric tonnes, given the average of the last ten years' production is 19.5 million metric tonnes. Assuming that yield will not substantially change, such decrease indicates that either the farmers will be reluctant to produce, or they will shift production to a different crop. Some farmers will be expected to cease production however, because alternative crops are limited. The area sown in wheat will decrease from 500,000 to 1,900,000 hectares. Eighty percent of farmers are engaged in wheat production, and of these 32,13% of the farmers produce wheat on 20 to 49 decar, 17,98 % on 50 to 99 decar (Aydogus and Nevruz, 1998). These small farms would be most likely to be effected from such decrease in production. Therefore, 65,000 to 250,000 agricultural enterprises (3 to 9% of total holdings) should be expected to move out of agriculture. Considering the creation of employment per capita costs is US$ 70,000 in Turkey, (Comert, 2000), the social costs of this unemployment would be US$ 4,6 to US$ 17,5 billion. The results of pilot application also support the findings of the study.

7. Conclusion

DIS was adapted to compensate the income loss of farmers after the removal of the input subsidies, price support system, and to link domestic markt prices to world market prices, along with the privatization of most state enterprises in agriculture to reduce government involvement in the marketing and processing of agricultural products. The budget costs of the support system would, therefore, be reduced. Implementing such a system however, does not always meet its objectives, considering the agricultural structure in Turkey, where the share of agricultural employment is about 35 %, farms are small in scale (an average of 6.1 hectares), rural income is very low, the level of agricultural tech-

Table 3 Wheat Factory Price (US$ per metric tonne – Bulk)

Scenario	Tariffs (%)	US originated wheat	EU originated wheat
1	50	238	204
2	40	223	192
3	30	207	178
4	20	192	166
5	10	177	153
6	0	162	140

Table 4. *Wheat Production Forecast After Implementation of Direct Income Payments is Discontinued*

Price of Wheat (USD/MT)	Production *(kg)*
238	18,499,769,203
204	17,626,166,918
223	18,090,424,830
192	17,286,149,263
207	17,707,854,219
178	16,923,348,757
192	17,305,164,014
166	16,541,623,464
177	16,879,568,467
153	16,138,376,121
162	16,427,613,974
140	15,710,392,764

nology is still not high, and regional differences are evident. The DIS system, implemented in developed countries along with other support tools, are very unlikely to accomplish the same objectives in Turkey if not accompanied by other support tools, due to different structural problems.

The results indicate that domestic prices will decrease considerably after the DIS system is removed. This may have a negative impact on production. As a result, imports of agricultural products would increase, leaving consumers exposed to fluctuating world prices. In addition, it is expected that social costs will increase due to an increase in migration. This will have some unfavorable implications. First, the traditional link between the rural and urban areas would be broken. Second, the migration of the unemployed to the cities can bring a high cost to the government unless the government provides a social program to create employment opportunities. Otherwise, violence in the cities, increasing rates of crime, and social and political restlessness can be some of the potential results.

A big structural problem exists, and applying DIS is not a solution. As seen from the results, removing all the subsidies and implementing DIS could solve no important problems. Although removing protection and subsidies from the sector will enable countries to gain from international trade, the structural differences between the various countries would mean that equal opportunities would not prevail. The developed countries have a competitive advantage in terms of productivity and price, due to their high supports to the sector over time. For this reason if the sector were to be opened to international trade, the agricultural structure should be improved in order to receive equal opportunities. This means that a planned improvement of the sector through time with close interaction with other sectors is needed. The policy making should be central and a national agricultural policy fitting to the agricultural structure of the country needs to be prepared. By taking into account the regional differences and crop basis, production can be organized, production costs can be reduced, and the use of technology can be improved. In addition, a national policy with close interaction with other sectors should be implemented along with improvements in infrastructure, education, and health to absorb the excess agricultural labour in the medium to long run.

DIS should be implemented as a complementary tool with other subsidies. Based on the pilot implementation and findings of the study, it can be recommended that DIS is better to be associated with contract farming, agricultural insurance, rural development and environmental protection, given the current Turkish agricultural structure. It can also be associated indirectly with crops which have supply deficit. It should also be used for supply control of some crops with low supply elasticity of price such as tobacco, hazelnuts, sugar beet, and tea. To draw sensible conclusion about the impact on farmers' income and the social life in rural and urban areas, DIS should be monitored and evaluated, continuously if there is a plan to implement DIS in the near future in Turkey.

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