AGRICULTURAL POLICY REFORM IN TURKEY: A SOCIAL ACCOUNTING MATRIX PERSPECTIVE

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EXECUTIVE SUMMARY

This study examines the implications for agricultural and other households in Turkey of a switch away from existing agricultural policy mechanisms (principally support prices, input subsidies and trade restrictions) towards a system of direct income payments to households.

The cornerstone of the analysis is the development of a Social Accounting Matrix (SAM) for Turkey. The SAM emphasises the agricultural aspects of the economy and the linkages from agriculture to the rest of the economy.

A SAM describes the circular flow of income in the economy. For example, in a simple closed economy setting, production generates value added, which is paid as wages and rent to factors of production. These incomes are then payable to institutions including households and the government. The incomes of institutions are then saved or spent on domestic production or imports. The circle is closed when domestic consumption leads to further production. The linkages become more complicated as greater detail on the economy is provided, but the principle of a circular flow of income still holds.

The SAM is first and foremost a framework for organising economic data.

The first contribution of the SAM is that it *describes* the role of agriculture in the Turkish economy. In particular, the SAM brings together data on the structure of the agricultural sector, its linkages to the broader economy, and the connections to the distribution of household incomes and expenditures. It consolidates three important data sets: an input-output survey, a survey of household incomes and a parallel survey of household expenditures.

The SAM can also be used to consider the implications of alternative reform proposals. The SAM developed in this study is designed specifically to address some of the key issues concerning Turkish agricultural policy. Thus, in the disaggregation of productive sector accounts, detail is provided on the agricultural sector and

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agriculture-related industries both upstream and downstream from the farmgate. Similarly, households are distinguished according to whether they are engaged in agricultural activities or not, whether they are located in rural or urban areas and according to their level of income. This exercise in data organisation is of value in its own right. The data may be used both as a source for future analysis and to address specific policy questions.

The shortcomings of Turkish agricultural policy have been well documented, and there is considerable evidence to suggest that 'decoupled' direct income payments can deliver assistance more efficiently and more equitably.

Under the agricultural policies adopted in Turkey, the level of support provided to producers is linked to the volume of production. The net economic costs of such policies are well known and there is specific evidence regarding the extent of these losses in Turkey (including that presented by the World Bank, the United Nations' Food and Agriculture Organisation and the Organisation for Economic Cooperation and Development).

There is considerable evidence to suggest that decoupled agricultural policies, such as direct payments, can deliver income assistance more effectively than market based measures such as price supports, input subsidies and trade restrictions. Not only do direct income payments induce fewer economic distortions than policies under which support is tied to production, they also mean that support can be targeted to deliver the desired distributional effect.

Although policy reform is likely to lead to an overall improvement in economic welfare, any change from the status quo will mean that there are both winners and losers.

From a practical standpoint, it is important to have information on the distribution of agricultural incomes, and the distributional implications of policy reform. Such information can assist in the design of a system of direct payments and the development of compensatory payments (to the extent that these are deemed to be necessary).

The distributional consequences of any change in policy depend

fundamentally on the structure of the agricultural sector, and on the linkages between agriculture and the rest of the economy. These factors are considered by the SAM in order to establish the pattern of winners and losers that is likely to be generated by policy reform. The SAM may also serve as a first step towards the development of a database according to which eligibility for support can be determined.

It is notable that the problem of low incomes in Turkey is more a rural issue than a specifically agricultural one. This raises the question of whether agriculture-specific policies are the best way of supporting household incomes.

The income distribution data (which are incorporated into the SAM) show that, in rural areas, the incomes of agricultural and non-agricultural households are very similar, not just in terms of average incomes, but also in terms of the distribution. The same is true in urban areas. These similarities are evident despite basic differences in the sources from which agricultural and non-agricultural households derive their income. The key distinction is between rural and urban households, with urban households likely to earn more than rural households, irrespective of whether they derive their income from agriculture or not.

If a goal of social policy is to support incomes at some minimum level, or to redress problems of income inequality, the data therefore suggest that policies should be targeted at rural households in general rather than just agricultural households.

There are few linkages from agricultural households to rural non-agricultural households.

A 1 million TL increase in the expenditures of the average rural agricultural household causes the incomes of all households to rise by an estimated 1.48 million TL over and above the initial payment. Of this increase, 0.33 million TL accrues to rural agricultural households and 0.25 million TL to rural non-agricultural households. This contrasts with a benefit of 0.85 milllion TL to urban non-agricultural households. The implication is that agricultural support cannot be relied upon to support the broader rural community through induced linkage effects**.**

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Agricultural households would benefit more from direct income payments than they do from price supports and input subsidies.

Although the total income effect of agricultural support exceeds the income effect of support to households (the multipliers being higher in the former case), households gain more from direct support because they benefit from the initial injection as well as from linkage effects. Indeed, support to the poorest agricultural households leads to an increase in aggregate household income that is 50% higher than that achieved by an equivalent amount of support to the cereals sector.

If support is restricted to low-income households, the economic costs of intervention can be cut dramatically.

The richest 20% of agricultural households receive nearly ten times more income than the poorest 20%. The broad correspondence between farm income and farm size implies that the cost of using price supports to establish a minimum level of income is several times higher than the cost of a targeted direct payment scheme would be.

The limitations of the SAM approach can be overcome by a more sophisticated model in which prices are flexible and by the modelling of household level decisions.

The SAM framework suffers from a number of limitations. The most significant of these is the assumption that the economy is purely demand driven and there are no relative price effects. This limitation can be overcome by a CGE model. The SAM provide the basic database for a CGE model and the current framework could be adapted to consider the shift in resources from agricultural to non-agricultural activities when agricultural prices are reduced.

The accumulation of survey information on the behaviour of agricultural households may also be used to consider how agricultural households adapt in the face of structural change and policy change. As agricultural prices fall, either as a result of policy reform or fundamental pressures under which the growth of supply tends to outpace increases in demand, some agricultural households and enterprises are likely to remain profitable, while others are not. Farm households which are not competitive are likely to respond either by diversifying their sources of income, or by exiting the sector altogether. Household level analysis can provide important insights

into the likely path of adjustment.

The data are now available both for the development of a CGE model and the specification of a range of household level models. Together these may yield further insight into the behaviour of agricultural households in Turkey and how they are likely to respond to a more liberalised policy environment.

A key policy recommendation is that the objective of income redistribution needs to be made more specific.

If existing policies are to be removed, then it is legitimate to worry about who will win and who will lose. Indeed, a main worry about the removal of price supports and other output-related measures is that, whilst aggregate incomes may improve, many agricultural households will suffer a sharp drop in their incomes and there will be attendant social problems (such as accelerated rural-urban migration). Our study suggests that such effects can be forestalled by the design of an appropriate method of compensation.

In general, the objectives of policy need to be reformulated in terms that are consistent with legitimate economic and social objectives and sufficiently clearly articulated that the performance of policy can be measured and compared with possible alternatives. In particular, the objective of income support needs to specify the criteria under which households would qualify for support. Given that, in rural areas, the incomes of non-agricultural households are generally no higher than those of agricultural households, it may not make sense for such criteria to be tied to agricultural production at all.

A pre-requisite for a direct income payment scheme is a registry of households.

If a system of direct income payments is to be introduced, its viability will depend largely on the functioning of a household registry. If the goal of policy is to compensate farm households for the removal of price supports, input subsidies and other subsidies, then payments based on historic farm size are one way of ensuring that the distribution of the benefits from change corresponds broadly to the pattern of losses. In the long term, however, payments based on the level of household income

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can be targeted to low-income households. Unfortunately, it is more difficult to build a registry under which selected agricultural (and perhaps non-agricultural) households provide full reports of their incomes, than it is to establish one based on farm size.

Neither the SAM, nor the income distribution survey around which it is partially constructed, provide enough information on which to base a system of direct payments. However, they do provide information on the structure of the agricultural and rural economy, and this may inform decisions regarding the criteria under which households would qualify for income support.

1. INTRODUCTION

1.1. Background to the Policy Debate

The basic mechanisms through which the government intervenes in Turkey's agricultural sector date back to 1932, when a minimum price was first established for wheat. Guaranteed prices remain the cornerstone of Turkish agricultural policy to this day.

Across both developed and developing countries, agricultural policy has shown the same tendency to accumulate and to be revised at the margin. Radical overhaul has been relatively rare. However, a number of OECD countries have introduced policies that allow market prices to guide the allocation of resources. For example, Australia and New Zealand both introduced radical reforms in the 1980s, removing most specific government support for their agricultural sectors. Reform has been more piecemeal in both the European Union (EU) and the United States (US), but the 1992 reforms of the EU's Common Agricultural Policy and the 1996 Federal Agriculture Improvement and Reform Act (the FAIR Act) both represent significant changes in the orientation of policy.

In each case, the emphasis of policy reform has been on replacing policies through which extent of assistance is linked to the volume of production (as with price supports) with policies which exert less of an influence on the decisions of producers and consumers. Reforms throughout OECD countries have been driven by the consensus that market-orientated policies, that is, those that allow market prices to guide the allocation of resources, are more efficient and more equitable than policies under which support is tied to production. They are also recognised to impose fewer distortions on international trade. The consensus behind liberal markets is reflected in the 1987 Ministerial Principles of the OECD and was a fundamental premise behind the 1994 GATT Agreement.

Underlying the reorientation in the policy interventions of industrialised countries is the acceptance that policies introduced as emergency responses to the effects of depression or war are inappropriate to current economic conditions, or those which are likely to prevail in the millennium. A major question, however, is whether

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the types of reforms introduced in the richer industrialised countries are appropriate to countries such as Turkey, where per capita incomes are lower and a higher proportion of the population is employed in the agricultural sector.

The consensus of international organisations which deal primarily with developing countries, notably the World Bank and the United Nations' Food and Agriculture Organisation (FAO), is that the rationale for market-orientation applies to both developed and developing countries. Indeed, these two organisations have both suggested that Turkey's agricultural policies are in need of radical reform (World Bank, 1997; FAO, 1997). In this study, we examine the specific conditions of Turkish agriculture and consider the implications of a move towards more market-orientated policies.

1.2. Purpose of the Study

The central purpose of this study is to consider what would happen if Turkey were to replace its current policies (principally price supports, input subsidies and accompanying trade measures) with a system of direct income payments to farm households.

The emphasis of the study is on the distributional effects, rather than the net welfare implications, of policy change. Well-established economic arguments, supported by a wide range of empirical evidence, have demonstrated that policy measures under which the extent of government support is tied to the level of production impose substantial net economic costs on society. The FAO study cited above suggests that the farmers most adversely affected by price liberalisation would be those producing commodities which receive high levels of protection (notably cereals, sugar, tea, poultry, beef and cow milk). However, their losses would be more than offset by the gains to consumers from lower prices. The study estimates that the net improvement in aggregate welfare would be of the order of US$1 billion per year.

Notwithstanding the strong economic arguments against the use of output-related (or input-related) support measures, recommendations for policy reform must be mindful of their distributional implications. In general, output-related support measures, such as those adopted in Turkey, have inequitable effects on the distribution of income, since the level of support is proportional to the scale of output.

By contrast, direct income payments can be targeted to households that are deemed to be deserving of assistance. Thus, the "decoupling" of support from production would seem to make sense on the grounds of both efficiency and equity. Even so, the government may be reluctant to withdraw support sharply from those who had previously been entitled to it. A system of compensation may be necessary, both to give farm households time to adjust, and in order to make reforms politically palatable.

A notable feature of agricultural policy intervention is that not all the benefits of support reach the intended recipients. Rather, changes in production and consumption decisions mean that there are knock-on effects on incomes throughout the economy. The methodology adopted in this study attempts to capture the broader impacts of policy change. A description of these effects may assist policymakers in the design of appropriate compensation schemes, or in the determination of where income support is needed. Note that the concept of "compensation" involves recognition of the political need to mitigate the impacts of reform. In that sense, the distributional effects of a direct payment system need to be compared with the base case of existing policy. By contrast, the targeting of income payments according to criteria of equity, or the need to establish a minimum income level, can be considered (from a distributional perspective at least) outside the context of existing policy. In reality, political factors are likely to be an important consideration (as reforms in both the EU and the United States have demonstrated). However, the establishment of well-defined income objectives remains a legitimate long-term goal in terms of the design of a direct income payment scheme.

A fundamental difference between output-related measures, such as price supports and direct income payments, is that the latter can be targeted. In other words, the pattern of payments can be tailored to meet the distributional objectives of policymakers. An attribute of the methodology established in this study is that it establishes a database, according to which the impacts of establishing alternative criteria of eligibility can be traced out.

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1.3 Methodology

The basis for the analysis in this study is the development of a Social Accounting Matrix (SAM) for Turkey. The SAM emphasises the agricultural aspects of the economy and the linkages from agriculture to the rest of the economy.

The SAM framework has been used to provide insights into the distributional implications of policy reform. Hayden and Round (1982) provide a survey of early uses of social accounting methods in explaining the income distribution and employment effects of policy, while Haggblade and Hazell (1989) use a SAM framework to examine the extent of farm to non-farm linkages in sub-Saharan Africa. Recent applications of the SAM methodology have tended to focus on regional impacts. Adelman, Taylor and Vogel (1988) examine the implications of migrant remittances on the distribution of incomes in a village in central Mexico, while Subramanian and Sadoulet (1990) consider the transmission of production fluctuations and technical change in an Indian village economy. Parikh and Torbeke (1996) construct two village SAMs to compare the effects of industrial decentralisation with other developent strategies. The key to such disaggregated analyses is the availability of household level data.

Gunluk-Senesen (1991) developed the first SAM for Turkey by enlarging the 1993 Input-Output table, while Ozhan (1988) constructed a SAM for 1983 using a similar approach. Adelman et al. (1989), Yeldan (1989) and Harrison et al. (1993) have used other general equilibrium techniques to study particular aspects of the Turkish economy. However, the only study to incorporate household survey information, and hence shed light on the issue of income distribution, was undertaken by DeSantis and Ozhan (1995). This study utilises the 64-sector breakdown of the 1990 Input-Output table and results from the 1994 Household Income and Consumption Expenditures Survey. Households are distinguished according to whether they are located in urban or rural areas and according to income.

In this study we present a national level SAM, disaggregating households according to whether their income derives principally from agricultural or non-agricultural activity, whether they are located in rural or urban areas and according to income. The separation of economic activities also emphasises the agricultural and

agriculture-related sectors of the economy, with agricultural accounts expanded from the 1990 I-O table and non-agricultural accounts consolidated.

This emphasis allows us to focus on the effects of agricultural policy reform on agricultural, rural and other households. In particular, we examine how the effects of reform on farm households are likely to vary with the level of household income and the extent to which the benefits of existing policies extend to the rural non-agricultural community. The distributional effects of existing policies are compared with those of alternative direct payment schemes.

An examination of these distributional impacts is timely in view of the consideration being given to direct payment schemes in Turkey. Such changes have been recommended by the OECD (1994), the UN Food and Agriculture Organisation (1997) and the World Bank (1997). At present, the World Bank is cooperating actively with the Turkish government, with the aim of developing a practicable system of direct payments to farm households.

1.3. Components of the Study

The study is organised as follows:

Section 2: In this section we provide some background on the structure of Turkey's agricultural economy and examine how this has evolved over time. This serves two functions: first, it places the evolution of Turkish agricultural policy in context; second, it helps situate the current policy debate. Next, we explain the main strands of current agricultural policy, similarly considering policy in terms of its progression from earlier decisions. We describe the methods through which support is extended to the agricultural sector, and the level and pattern of intervention. This forms the basis for our appraisal of policy and provides the benchmark against which alternative reform proposals can be evaluated.

Section 3: Here we present an agenda for the analysis of Turkish agricultural policy. We argue that the performance of policy needs to be evaluated according to two criteria. One is according to the *economic* effects, in terms of the reallocations that result from policy intervention. This includes the welfare (efficiency) effects of

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policy and the economic reallocations that are induced when policy is changed. This can be considered in the general framework of transfer efficiency analysis, which is concerned with the distribution of the economic benefits (and costs) of policy intervention.

A number of these effects have already received substantial attention from economists. Reports in 1997 from the World Bank and the United Nations' Food and Agriculture Organisation both centred on the net welfare costs of Turkish agricultural policy. An OECD report in 1994 also examined Turkey's agricultural policies (OECD, 1994). Moreover, as an OECD country, policy developments in Turkey are the subject of ongoing scrutiny as part of the OECD's monitoring exercise. In addition, a number of academics have sought to examine the economic effects of intervention in the agricultural economy. In particular, the Turkish Agricultural Sector Model (TASM), maintained at the Middle East Technical University, has been used to examine how the allocation of economic resources is affected by policy intervention (Kasnakoğlu and Çakmak, 1997).

In general terms, the results of all these analyses conform to the predictions of standard neoclassical economics; namely, that policies under which the level of support is tied to the volume of production impose substantial net welfare costs on the economy. A further result is that the benefits of these policies are generally distributed in an inequitable fashion. Since the chief instruments of support adopted in Turkey are market price guarantees and input subsidies (with accompanying trade restrictions), the theoretical criticism, and the empirical support for that criticism, fit with general case against the mechanisms of agricultural support adopted in a wide range of developed and developing countries.

The second dimension of agricultural policy analysis -- and the main focus of this study -- is in terms of the *social* objective of supporting incomes in farming and rural communities. Given the *a priori* case for a reorientation of policy away from output-related mechanisms and towards decoupled and targeted assistance, it becomes important to examine how different types of household would be affected by policy reform. Accordingly, we examine the economy-wide pattern of winners and losers that would likely result from the removal of existing support mechanisms.

The results of such analysis provide an indication of the pattern of

compensation that may be necessary if policy reform is to be effected. More generally, a disaggregated assessment of the effects of policy reforms on alternative types of agricultural, rural and other households may inform the design of targeted policy measures.

Section 4: In order to examine the economy-wide pattern of costs and benefits generated by alternative agricultural policies we develop a Social Accounting Matrix (SAM) for Turkey. A SAM is, first and foremost, a framework for organising economic data. It describes the circular interdependence of, among other accounts, production, factor incomes and institutions (including households, businesses and government). For example, production generates value added, which is paid as rent to factors of production. These incomes are then payable to institutions. The incomes of institutions are saved or spent on domestically produced or imported commodities. The circle is closed when this domestic consumption leads to production.

Our SAM has the standard components. We pay particular attention to disaggregating the agricultural and food sectors within the Productive Sectors category, and agricultural and rural households within the Households category. This enables us to develop a mapping from the production of agricultural commodities to the payments of factors engaged in the production of those commodities, thence to the incomes of agricultural and other households, from there to expenditures on food and unprocessed agricultural commodities, and finally back to the production of the goods required to meet that demand. This task involves reconciling two detailed cross-sectional databases. One is the 1990 Input-Output Survey, the other is the 1994 Income and Expenditure Survey.

Having developed the SAM, we then use it as the basis for the evaluation of alternative policies. The alternatives considered are compensating payments to agricultural households and rural households (whether they are agricultural or not). In addition, we examine the implications of targeted payments, under which the benefits to higher income households are limited.

Section 5: In this section we present the results of the study. First, we present the SAM and discuss its principal attributes. Second, we compute the SAM's income multipliers. These multipliers indicate the extent of the potential linkage between

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different accounts in the SAM. We are concerned primarily with the linkages from government transfers to the incomes of agricultural households, and also the linkages between different categories of household. The latter indicate the extent to which the benefits of agricultural support reach households other than the direct beneficiaries. Finally, we use these multipliers to contrast the impacts of alternative reforms on different categories of household.

Section 6: In this section we present the conclusions of the study and discuss the implications for future work. The SAM shows how targeted direct payments can also be used to deliver support more efficiently than output-related measures, and more equitably, in the sense that households would receive a greater share of the policy benefits than they do from current (non-targeted) provisions.

Because the SAM provides disaggregated information on household incomes, it can also help inform the design of a system of direct payments. For such a policy to be successful, however, it is important that the criteria under which a household would qualify for income support are defined clearly. At present, the objectives of Turkish agricultural policy are stated too imprecisely for them to serve as a guide to the design of a direct payment system. In the event of such a system being adopted, the set of social values which define which households would qualify for assistance (and who would be expected to meet the bill) would need to be articulated clearly.

The SAM-based approach to economic analysis suffers from a number of limitations. Not least, the system is purely demand driven, and fails to capture the implications of changing relative prices. This shortcoming could be overcome by the development of a Computable General Equilibrium (CGE model). However, despite the limitations of the adopted approach, the SAM provides a transparent and interpretable guide to the nature of the linkages within the economy.

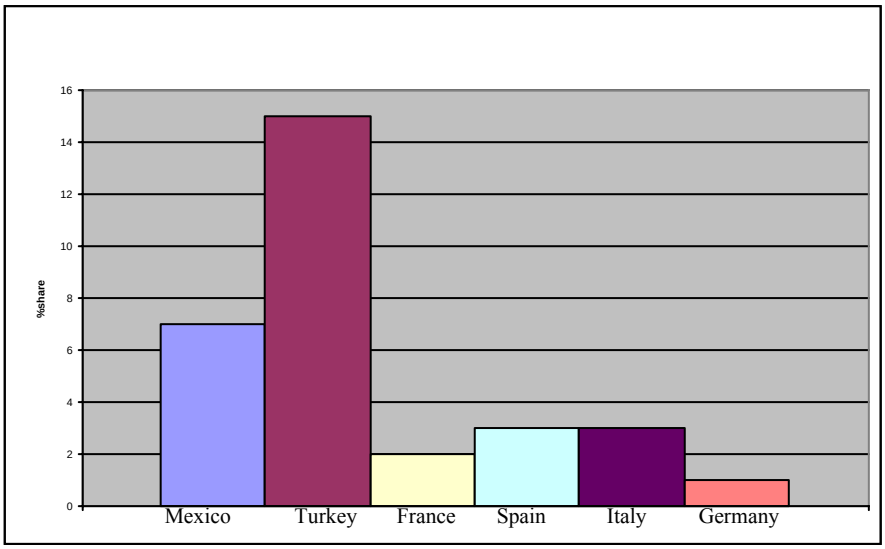
A priority for further analysis would be the accommodation of income diversification among agricultural households. At present, reduced support leads to a straight reduction in income. In reality, this impact is likely to be offset by households shifting their activities and obtaining income from other sources. Determining the extent to which households adjust to changes in support is an obvious priority for future research.

2. THE AGRICULTURAL POLICY ENVIRONMENT IN TURKEY

2.1. The Importance of Agriculture to the Turkish Economy

Agriculture remains one of the principal economic sectors in Turkey as a major contributor to Turkey's national economy and the largest single sector in terms of employment. Although faster growth in other sectors has meant that agriculture's importance has diminished in relative terms, the sector still accounts for 15% of GNP and 40% of employment. Figure 2.1 contrasts the share of agriculture in GDP in Turkey with that in other countries. Note that the ratio is twice that in Mexico, a fellow OECD member with a roughly similar level of average income per capita, and several multiples of that in the four EU countries shown.

Figure 2.1 Share of Agriculture in GDP



Source: OECD.

Agricultural output has increased in absolute terms but diminished relative to other sectors, notably manufacturing, trade and services. This pattern is consistent with the standard profile of economic development, where a deceleration in the demand for food and continued productivity growth enables resources to be released to other sectors.

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A distinguishing feature of Turkish development has been that, although agriculture's relative importance to the economy has diminished over time, the pace of decline has been slower than that experienced in other countries. Indeed, agriculture remains unusually important to the economy, given the progression in average incomes.

A key characteristic of Turkey's economy is that a number of industrial sectors have developed rapidly, while others have languished behind. The relatively low levels of income in agriculture are reflected in the difference between the sector's contribution to employment and its contribution to national income. The uneven pattern of economic development, reinforced by high rates of price inflation, has also been a major source of income inequality in the country.

The declining importance of agriculture fits the standard profile of economic development, and does not, by itself, imply that there is something 'wrong' either at the structural or policy levels. Indeed, the declining importance of agriculture is largely a product of success, since demand is satisfied with fewer resources being allocated to production.

The declining importance of agriculture conforms to international experience

The standard explanation of why agriculture becomes relatively less important in terms of output and employment holds, with a few modifications, in the case of Turkey. On the demand side, as real incomes improve, so the demand for food increases. However, because people typically spend a declining proportion of their income on food as their incomes increase, demand grows less for agricultural products than for other goods.

The effect of this profile of demand growth on prices and quantities depends on the accompanying supply situation. Assume, for the moment, that Turkey has a closed economy, and that productivity growth in agriculture is the same as in other sectors. Then the upshot of relatively slack demand growth in the agricultural sector is that the output of the agricultural sector rises, but by less than in other sectors. At the same time, the price of agricultural products falls relative to the price of non-agricultural products, with the extent of the price fall being greater the less responsive demand is to changing prices (i.e. the lower the elasticity of demand). Since

agriculture's contribution to national income is the volume of output multiplied by the price, this contribution is expected to decline when expressed as a share of national income.

If productivity grows faster in agriculture than in other sectors, then agriculture's contribution to GDP would be likely to fall even more sharply. In Turkey, productivity growth has been relatively slow, and this may account partially for the modest rate of sectoral decline.

Although Turkey's agricultural sector is insulated from world markets, international supply and demand conditions still affect the domestic market. Deteriorating international terms of trade have, to some extent, been reflected in lower real (inflation-adjusted) prices for agricultural commodities, and this has contributed to the relative decline of the agricultural sector. At the same time, the demand for non-tradeable goods, notably services, has tended to grow more quickly than the demand for tradeable goods (such as agricultural products). The tendency for both prices and volumes to increase more rapidly in the case of non-tradeables has reinforced the relative 'decline' of the agricultural sector.

In the case of Turkey, however, the pace of demand growth has not yet stagnated. Calorie consumption per capita remains well below the levels recorded in the higher income EU countries, and is on a par with Mexico and Korea. Moreover, the composition of demand is changing as incomes increase. Turkey's consumption of animal protein remains relatively low by international standards (about 21kg per capita for 1994-1996) suggesting that there is considerable scope for additional meat consumption. Expanded meat production is likely to boost the demand for coarse grains as animal feed, thus having effects on both the crops and livestock sectors.

The deceleration in demand is also likely to be slower than that observed in other OECD countries because of continued population growth. Turkey's population is estimated to be growing at 2.2% per year, compared with an OECD average of just 0.6% per year. Overall, the relatively robust outlook for demand means that it will be decades before agriculture's importance to the domestic economy drops to the levels seen in North America or Western Europe.

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Agriculture's importance as a provider of employment exceeds its importance as a contributor to output

Agriculture also tends to account for a declining share of overall employment. This is due to the declining share of sectoral output described above and improvements in the productivity of labour. In most industrial countries, labour productivity has grown faster in the agricultural sector than elsewhere, thus accelerating agriculture's declining importance as an employer. In Turkey, however, agriculture's contribution to employment remains more important than its contribution to income.

Agricultural trade will remain important to the national economy

With respect to international trade, the pattern of sectoral decline is less clearcut. Total trade (the sum of exports and imports) is likely to account for a declining share of total output. In the case of commodities where the growth in domestic demand is outpacing domestic availability, ratio of the exportable surplus to total production is in decline. This is the case. However, the ratio of imports to total consumption (or production) is likely to increase as Turkey becomes a net importer. This is simply a consequence of net trade being the balance of two items.

More significantly, agriculture's share of exports is likely to hold up, to the extent that the domestic demand for agricultural products tends to grow more slowly than the domestic demand for other goods. Assuming that differences in productivity growth do not negate this effect, the supply of exports is likely decline more slowly than sectoral output.

2.2. The Supply of Agricultural Products

The shares of crops and animal products have remained steady

Turkey's agricultural output increased by 5% per year between 1994 and 1997. The rate of growth was approximately the same for cereals as for livestock and animal products, with the consequence that the share of cereals in the overall value of production has remained more or less steady at 75%. Table 2.1 shows agricultural production in Turkey from 1994-1996.

Table 2.1. Agricultural Production in Turkey in 1994-1996

		1994	1995	1996
Crops			(000 tons)	
Total		129,748	82,703	87,468
	Cereals	26,934	28,084	29,344
	Pulses	1679	1849	1807
	Industrial Crops	13,827	12,302	16,794
	Oil seeds	929	2,392	954
	Tuber Crops	6,315	7,785	6,845
Field Crops		49,684	52,412	55,744
Fruits		18,001	11,346	18,022
Vegetables		12,379	18,945	13,702

Source: SIS, Agricultural Structure (1995)

The acreage sown to Turkey's principal crops has remained more or less constant for the last 25 years, and, With little additional land available for agricultural production, improved yields have been the driving force behind increases in output. However, average yields remain well below those recorded in North America, European Union or even in extensive farming countries such as Australia and Argentina.

At present, only about 15% of Turkey's cultivated land is irrigated. Both government sources (DSI) and external organisations (such as CIMMYT) have claimed that Turkey could easily double the amount of irrigated acreage. This would cause average yields to improve.

2.3. The Demand for Agricultural Products

As Turkey's economy has developed, so the per capita consumption of food has increased. By developed country standards, however, Turkey's per capita consumption of protein remains low. There is therefore considerable scope for an increase in the per capita consumption of both meat and grains, with an increasing tendency for the latter to be consumed indirectly in the form of animal feed.

Turkey's rising population will also contribute to the increasing demand for

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food. The total population, which now exceeds 60 million, has been increasing at a rate of 2.2% per year. Over the next five years, the population will increase by approximately 7 million.

It therefore appears that, at the aggregate level, domestic demand growth is likely to outstrip domestic supply increases over the coming years. At present, Turkey is self-sufficient in many agricultural products, including wheat and coarse grains, sugar, sheepmeat, chicken and eggs. It is less than self sufficient in rice, vegetable oils, milk products and beef. Although self-sufficiency has been maintained in many commodities, the excess of domestic production over domestic production has tended to decline in recent years.

2.4. Foreign Trade in Agricultural Commodities

There are a number of commodities for which Turkey has a large exportable surplus. These include tobacco, cotton, dried fruits, nuts, pulses, live goats and sheep, citrus fruits and tomatoes. There have been strong increases in exports of processed food products, while an increasing proportion of the domestic supply of cotton has been absorbed by the nation's textile industry.

The general pattern of supply, demand and trade in Turkish agriculture can be summarised as follows. Turkey remains self-sufficient in most staple agricultural commodities, but, as domestic demand outpaces the growth in domestic availability, the extent of this self-sufficiency is declining. At the same time, there are a number of commodities in which Turkey's position as a net exporter is unlikely to be challenged. These include cotton and hazelnuts. However, a large proportion of primary products is processed prior to export and this proportion may increase over the next 5-10 years. Other commodities may thus start to mirror the case of cotton, where exports have declined as an increasing proportion of output is absorbed by the domestic textile industry.

2.5. Farm Household Incomes

The Data Set

Data on the incomes of Turkish households were compiled as part of the 1994 Income and Expenditure Survey. A total of 26,236 households were interviewed, with each income earner in the household asked to describe his or her sources of income. There were 118,000 respondents in total, implying an average of 4.5 reporting earners per household.

For the purposes of this study, the households were partitioned according to whether they were located in rural or urban areas, and whether their principal economic activity was agricultural or non-agricultural. The classification of a rural household follows the official definition; namely, a household is deemed to be a rural household if it is located in a district with a population of less than 20,000 inhabitants. We defined an agricultural household as one in which the main economic activity of the principal earner is agricultural.

These definitions led to the following partitioning of the data set:

Table 2.2. Partitioning of the Data Set According to Location and Occupation

	Location		
Occupation	Rural	Urban	All Locations
Agricultural	4,071	761	4,832
	15.5%	2.9%	18.4%
Non-Agricultural	3,903	17,501	21,404
	14.9%	66.7%	81.6%
All Occupations	7,974	18,262	26,236
	30.4%	69.6%	100%

The Sources of Household Income

The sources from which households derive their income vary substantially according to both location and principal occupation. Table 2.3 divides total household income

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into six components for each category of household.

Table 2.3 Sources of Income by Type of Household

	Salaries & Wages	Rent	Agricultural Profit	Other Profit	Govt Transfers	Overseas Remittances	Total Income
Rural Ag.	7.8%	4.8%	77.1%	4.2%	4.5%	1.7%	100%
Urban Ag.	13.6%	11.4%	47.8%	17.0%	7.7%	2.5%	100%
Rural Non-Ag.	38.7%	9.7%	9.2%	33.1%	7.3%	2.1%	100%
Urban Non-Ag.	36.5%	12.0%	1.2%	40.9%	8.2%	1.3%	100%
Average	32.6%	10.8%	12.5%	34.9%	7.6%	1.4%	100%

On average, profit and labour income (salaries and wages) constitute the major income sources in Turkey. Collectively, these account for two-thirds of aggregate household income in Turkey.

Agricultural income, not surprisingly, is the principal source of income for agricultural households, although the small numbers of agricultural households in urban areas are more diversified, receiving a greater share of their incomes from salaries and wages, rent, and profit.

Directed government payments are targeted more towards urban households. This partly reflects the provision of agricultural support through market intervention; but among agricultural households it is notable that those in urban areas receive relatively more from the government.

These average numbers conceal substantial differences within each group. In particular, profit becomes a more important source of income at higher income levels. Tables 2.4 to 2.7 show these variations for income quintiles within each household category.

Table 2.4. Table Sources of Income for Rural Agricultural Households, by Quintile

Quintile	Salaries & Wages	Rent	Agricultural Profit	Other Profit	Govt Transfers	Overseas Remittances	Total Income
0-20%	13.7%	11.3%	62.3%	5.7%	6.4%	0.5%	100%
21-40%	12.8%	7.7%	66.1%	3.9%	7.9%	1.5%	100%
41-60%	9.6%	6.0%	72.9%	3.6%	7.0%	0.9%	100%
61-80%	10.0%	4.5%	75.8%	3.9%	4.9%	0.9%	100%
81-100%	4.5%	3.1%	83.0%	4.4%	2.6%	2.4%	100%

Rural agricultural households receive most of their income directly from agriculture. However, poorer households tend to be more diversified, receiving a greater proportion of their incomes from wages and rent, and -- to a lesser extent -- non-agricultural profit. Government payments, though less important to the richest households, are not targeted specifically at the poorest households.

Table 2.5. Sources of Income for Urban Agricultural Households by Quintile

Quintile	Salaries & Wages	Rent	Agricultural Profit	Other Profit	Govt Transfers	Overseas Remittances	Total Income
0-20%	36.2%	16.0%	26.4%	8.4%	12.6%	0.4%	100%
21-40%	25.0%	15.0%	38.1%	7.2%	12.8%	2.0%	100%
41-60%	21.5%	14.0%	41.6%	4.4%	16.1%	2.4%	100%
61-80%	19.7%	12.6%	47.9%	5.6%	12.3%	2.0%	100%
81-100%	6.0%	9.4%	52.6%	26.1%	3.0%	2.9%	100%

A similar pattern is in evidence for urban agricultural households, as Table 2.5 shows. The main difference between rural and urban agricultural households is that the latter receive much less of their incomes directly from agricultural. Indeed, only the richest 20% of urban agricultural households receive more than half their income directly from agriculture. The remainder may nevertheless be indirectly dependent on agriculture, receiving wage income in either from working on farms or in farming

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related industries.

The chief difference between rural and urban non-agricultural households (Tables 2.6 and 2.7) concerns agricultural income. Although a minor share of income, it is nevertheless increasingly significant to rural households at higher income levels. The poorest rural non-agricultural households are more diversified than their urban counterparts, receiving significant amounts of income from rent and profit (however, their incomes are generally lower too, as is discussed in the next section).

Table 2.6. Sources of Income for Rural Non-Agricultural Households, by Quintile

Quintile	Salaries & Wages	Rent	Agricultural Profit	Other Profit	Govt Transfers	Overseas Remittances	Total Income
0-20%	39.1%	16.4%	3.2%	20.1%	18.8%	2.4%	100%
21-40%	49.5%	11.8%	5.1%	18.6%	13.7%	1.3%	100%
41-60%	51.8%	11.4%	7.3%	19.3%	8.7%	1.5%	100%
61-80%	46.0%	8.8%	9.5%	26.3%	7.8%	1.6%	100%
81-100%	28.8%	8.2%	11.2%	45.2%	3.9%	2.6%	100%

Table 2.7. Sources of Income for Urban Non-Agricultural Households, by Quintile

Quintile	Salaries & Wages	Rent	Agricultural Profit	Other Profit	Govt Transfers	Overseas Remittances	Total Income
0-20%	50.9%	13.5%	0.2%	16.3%	18.2%	0.9%	100%
21-40%	50.2%	15.4%	0.4%	18.1%	15.2%	0.8%	100%
41-60%	49.4%	14.5%	1.0%	21.9%	12.1%	1.1%	100%
61-80%	50.3%	12.7%	1.0%	25.7%	9.0%	1.3%	100%
81-100%	23.8%	10.3%	1.6%	58.3%	4.5%	1.4%	100%

The Level and Distribution of Incomes

Table 2.8 shows the average level of income according to household type, broken down by quintile.

Table 2.8. Mean Incomes by Household Type and Income Quintile (Billions of

Turkish Lira)

	Rural Ag.	Urban Ag.	Rural Non-ag.	Urban Non-ag.	All Households
0-20%	31.8	40.7	35.5	46.7	42.6
21-40%	57.2	71.6	62.5	77.1	71.7
41-60%	85.1	105.7	88.1	112.0	104.1
61-80%	124.9	155.6	129.0	165.6	153.5
81-100%	272.4	454.7	283.3	433.3	386.7
Average	114.3	165.7	119.7	167.0	151.7

The most striking result is that, in both rural and urban areas, the income profiles of agricultural and non-agricultural households match very closely. On average, non-agricultural incomes are slightly higher. Not only is this result true on average, it also holds across all income quintiles. In terms of total income, what matters is whether the household is located in a rural or an urban area. Urban incomes are higher than rural incomes irrespective of whether the household's main economic activity is agriculture or not. The extent to which urban incomes exceed rural incomes is greater at higher income levels. For example, among non-agricultural households, urban incomes exceed rural incomes by 32% in the bottom quintile and 39% in the top quintile. The ratios are 28% and 45% respectively among agricultural households.

The similarity between agricultural and non-agricultural incomes is particularly noteworthy given the marked differences in the income sources of non-agricultural households. The reasons for the similarity are worthy of formal investigation. One possible cause is that households are adaptable and are likely to move out of farming if the returns dip below those attainable in other sectors. Thus the cross-section survey figures reflect an "equilibrium," in the sense that the households remaining in farming make as much money as they would in other occupations.

Against this however, it should be noted that the difference between rural and urban incomes is consistent with the observed phenomenon of rural-urban migration. The limited scope for farming in agricultural areas means that farmers leaving rural areas would be expected to seek new jobs in other industries.

Across all household types, there is considerable income inequality. In

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general, incomes in the top quintile are nearly ten times incomes in the bottom quintile.[1] The pattern of inequality is broadly similar in both rural and urban areas, and between agricultural and non-agricultural households. In general, the poorest 20% of households earn 28% of mean household income and 44% of median household income. Median household income, at 92.6 billion TL, is only 61% of the mean value.

2.6. Agricultural Policies in Turkey

The Institutional Framework

Agricultural policy in Turkey is guided by the annual programmes and development plans of the State Planning Office (SPO). The Ministry of Agricultural and Rural Affairs (MARA), the Agricultural Bank and the Treasury share responsibility for the actual implementation of policy. The chief mechanisms of support in Turkey are price supports, accompanying trade measures (principally import tariffs) and input and credit subsidies.

The actual administration of policy is organised through a system of state-owned and directed State Economic Enterprises (SEEs) and Agricultural Sales Co-operatives and their Unions (ASCUs). The following SEEs are involved in the implementation of agricultural policy:

- TMO. The Turkish Grain Board is responsible for cereals, pulses and coarse grains. It is involved in support purchases, domestic sales and international trade, an in the operation of storage facilities.
- SEKER. Turkish Sugar Factories Inc. bears similar responsibility for sugar. It is also integrated downstream, with sugar processing facilities, and is the exclusive distributor of fertiliser, seeds and pesticides to growers.
- TEKEL. Turkish State Monopolies is responsible for the tobacco industry. It is involved in support purchases, seed purchases and activities designed to improve quality and yields. It also has a monopoly over cigarette imports.
- ÇAYKUR. The Tea Industry Corporation is responsible for the administration of

[1] The true degree of income inequality is likely to be higher to the extent that the highest earners (say in the top 1%) are excluded from the sample.

Turkish tea policy.

ASCUs are similarly responsible for the support of domestic prices. In contrast with the SEEs, their actions consist of support purchases from voluntary associations of producer members. In economic terms, however, their impact is much the same. The main ASCUs are given below, along with their commodity coverage:

- ANTBIRLIK. Cotton; cotton seed.
- CUKOBIRLIK. Cotton; cotton seed; soybeans.
- FISKOBIRLIK. Hazelnut.
- GULBIRLIK. Rose flower.
- GUNEYDOGUBIRLIK. Pulses; sunflower; pistachios; raisins; olive oil.
- KARADENIZBIRLIK. Sunflower; soybeans.
- TARIS. Olive oil; soybeans; raisins; cotton; cotton seed; figs.
- TIFTIKBIRLIK. Mohair.
- TRAKYABIRLIK. Sunflower; soybeans.

The instruments of support and levels of intervention

Market price support constitutes the main category of assistance to Turkish agriculture. In 1997, partly as a result of lower world prices, guaranteed prices accounted for 85% of all assistance to agriculture and over one-third of the total value of production (OECD). The second largest category of support is input and credit subsidies. These are paid from the Support and Price Stabilisation Fund and the Resource Utilisation Support Fund and channeled through the Agriculture Bank (Ziraat Bankası). In 1997, input and credit subsidies each accounted for about 5% of government support.

Domestic prices have been protected through the use of import tariffs (see below). In addition, duties collected on agricultural imports were used to fund export subsidies, though the use of export subsidies has been largely curtailed in recent years.

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Price Supports

For most agricultural crops, domestic prices are maintained above world market levels. Since 1994, the prices of cereals, tobacco and sugar have been supported through subsidised procurement by the country's State Economic Enterprises (SEEs). The SEEs are compensated by the Treasury for any losses related to these purchases, through so-called "duty loss" provisions. Support prices are announced by the Council of Ministers or the High Planning Council after plantings have been made. This means that planting decisions have to be made on the basis of prices in the previous year.

Prices are also maintained above world market levels for a number of other commodities. In these cases, instead of the government guaranteeing a minimum price, a sales cooperative (ASCU) offers to buy at a given price. If this price is supported through tariffs on imports, then the economic effect is the same. Reflecting the earlier list of ASCUs, the commodities which receive effective price support include tea, cotton, tobacco, sunflower, hazelnuts, olive oil, raisins and figs.

Import Restrictions

Turkey uses tariffs to restrict imports of a number of commodities. In the case of crops, these tariffs can be viewed as by-product measures, since they are necessary to defend domestic price supports. Livestock products are protected exclusively through the use of import tariffs. This has the same economic effect as price support, however, since the tariffs enable farmers to sell their products at prices that exceed world market levels.

In order to comply with the URAA, Turkey was obliged to set bindings on tariff levels and reduce these over the implementation period. In most cases, Turkey set these bindings at levels that were higher than the actual rates being applied. At present, therefore, there is little legal obligation for tariff reduction; indeed, some tariffs could even be increased. Grethe (1997) estimates that reductions may be necessary for some fruits and vegetables, and for processed cereals. In general, trade commitments have not compromised domestic support policies.

Input and Credit Subsidies

Input subsidies are granted mainly for fertiliser, hybrid seeds and pesticides. Most of these payments are made via the Agricultural Bank (Ziraat Bankası). Agricultural investment incentives include reductions in customs duties, incentive credits, income tax reductions and payments from the Resource Utilisation Support Fund. This fund also subsidises the import of machinery and equipment. Its grants for agriculture must be approved by the Agriculture Bank, which disburses the funds.

Loans to farmers are provided at concessional rates by the Agriculture Bank, and disbursed either by the bank directly, or through intermediaries such as the ASCUs and the Agricultural Credit Co-operatives. These loans have generally been made at negative real rates of interest. In addition, livestock farming has benefited from lower rates than crop production. Credit in the Sugarbeet industry is provided through Sekerbank.

Export Subsidies

Since 1996, the list of commodities that have received export subsidies has been restricted to potatoes, tomatoes, onions, citrus fruits and apples. On some occasions, however, tea and sugar have also received implicit subsidies since the SEEs responsible for purchases of their output (CAYKUR and TSFC respectively) have sold this output at a loss on the world market.

Other Payments

There is a transport subsidy for fruit and vegetables. Other "general payments include spending on research and extension, inspection services and infrastructure.

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3. AN AGENDA FOR THE ANALYSIS OF TURKISH AGRICULTURAL POLICIES

3.1. Policy Goals

Any policy, agricultural or otherwise, needs to be evaluated in terms of its success, relative to other policies, in attaining worthwhile policy objectives. It is important that the objectives set out by policymakers have a legitimate rationale and that the chosen policies should be better at furthering these objectives than the available alternatives. These points may seem obvious, but they are worth emphasising in view of the net economic costs and the inequitable consequences of agricultural policy intervention in Turkey.

3.2. The stated goals of Turkish agricultural policy

The stated objectives of Turkey's agricultural policies are set out in the government's five-year Development Plans. They are:

1. Ensuring adequate levels of nutrition
2. Raising production levels and yields
3. Reducing the vulnerability of production to adverse weather conditions
4. Raising levels of self-sufficiency
5. Increasing agricultural incomes and improving income stability
6. Increasing exports
7. Developing rural areas

For an elaboration of these objectives, see OECD (1994).

The list of objectives is as notable for what is does not include as for what it does. Although there is a commitment to improving yields, there is no direct reference to 'efficiency' at the farm level. Even more strikingly, whilst there is a commitment to improving farm incomes, this is not made with respect to an explicit benchmark (such as average incomes) and there is no commitment to reducing income inequality, either between the agriculture and other sectors, or within agriculture. Finally, there is no mention of the need to alleviate poverty.

3.3. Reasons for Policy Intervention

'Economic' versus 'social' policy objectives

In general, the justifications for policy intervention can be divided into two categories. The first is to enhance the efficiency (or economic welfare) of the system in the broadest sense; the other is to pursue social objectives which reflect a set of 'social values' rather than strictly 'economic' considerations. Put crudely, such interventions correspond to increasing the size of the pie and adjusting the shares of the pie, respectively. The two sets of objectives are not necessarily compatible (for example, redistribution from the rich to the poor may impair economic efficiency), which means that policy options cannot always be ranked unambiguously. Nevertheless, it is still possible to make some observations about the characteristics of good and bad policy. In the case of economic objectives, the case needs to be made for how policy intervention will improve economic efficiency. This means that the shortcomings of the market must be identified and the improvement that may obtain from policy should be made clear. Insofar as social objectives are concerned generally with distributional matters such as equity, it is important that the system of values underlying these objectives is made explicit, for only then can the success of policy be evaluated.

Efficiency-based arguments for government intervention

The basic case for government intervention on economic (efficiency) grounds rests on market failure. In an idealised neoclassical world, in which goods are 'private'[2], markets are perfectly competitive, the utility of the good to consumers is fully reflected in their demands, and all costs are reflected in supply, the free market equilibrium corresponds to the "social optimum."

However, these conditions apply to an idealised world, and there is likely to be some degree of failure in most markets. That does not mean, however, that market

[2] Private goods have the following characteristics: (1) the consumption of private goods is 'rival' -- consumption by one person prevents consumption by another. (2) The consumption of private goods is 'excludable' -- they can be withheld from a potential consumer. (3) Both the production and consumption of private goods are divisible – they can be sold and consumed one unit at a time. Note

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intervention is necessarily the best solution. In the first place, government intervention and political processes have their own costs. For example, there are the administrative costs associated with government programs. In addition, deadweight costs are incurred when those groups affected by policy lobby to influence government decision (rent-seeking).

As a general rule, the fewest distortions are introduced when the source of market failure is tackled directly. For example, if there are social benefits (such as environmental benefits) associated with production, which mean that the social cost of production is less than the private cost, then it is more efficient to subsidise production such that producers incur the social cost of production. By contrast, guaranteed prices, although they stimulate production, restrain consumer demand. In general, policies that affect more than the source of market failure introduce additional 'by-product' distortions (efficiency losses).

What evidence is there, then, of systemic market failure in agriculture? In general, agricultural commodities can be characterised as private goods, since consumption by one person prohibits consumption by another. In addition, there are many producers, typically working independently with few barriers to entry. This means that farmers find it difficult to behave monopolistically. Indeed, Turkish agriculture is highly fragmented compared with other OECD countries, where a relatively small number of large-scale commercial firms dominate production. Yet, even in other countries, there is scant evidence of monopoly power being exercised at the farm level.

On the demand side, there are few 'externalities,' which is another way of saying that the social benefits from consumption reflect what people are willing to pay. In general, people maximise their own welfare by allocating their incomes over a range of goods and services. There may be some broader nutritional issues (and costs) which mean that that public benefits from food consumption diverge from the perceived private benefits. However, nutritional considerations cannot explain the panoply of market intervention in Turkish agriculture.

On the supply side, there may be environmental side effects (both good and bad) associated with agricultural production. As with demand-side externalities,

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that defence, which is typically considered to be a public good, violates each of these assumptions.

however, standard economic analysis would suggest that the externality should be tackled at source rather than through a complex system of market intervention. Linkages to the broader economy have also been advanced as a positive externality, but in general agriculture generates fewer linkage effects than other sectors (Sadoulet and de Janvry, 1995).

Efficiency based justifications for market intervention usually centre on the dynamic benefits from expenditure on research and extension (which has public good properties), the development of public infrastructure, and the management of risk. To the extent that uncertainty reduces the information content of prices, and producers and consumers cannot use market mechanisms to adapt to risk, there may be a role for government. Under such circumstances, there is an *a priori* case for addressing the issue of risk directly, for example through income insurance schemes.

3.4. The economic objectives of Turkish agricultural policy

Among Turkey's stated goals, the efficiency-based objectives are stated, at best, indirectly. In no case, do they correspond to the identification of market failure. The pursuit of goals 2, 3, 4, 5 and 6 *may* lead to improvements in economic efficiency. In each case, however, they can also be pursued in ways that *reduce* economic efficiency. For example, price supports and inputs subsidies (the chief mechanisms of support in Turkey) induce efficiency losses, even though they may help further each of the goals listed above.

One problem is that the stated goals do not represent legitimate economic objectives in their own right. 'Increasing production' may sound more concrete than 'improving efficiency' but there is little point in increasing production for its own sake. Similarly, maintaining self-sufficiency may sound laudable, but presumably the reason for doing this is to improve food security. What if such security can be achieved at a much lower resource cost through diversified trading relationships? The basic unit of measurement should be the long-term economic welfare of the people that are affected by agricultural policy, and the performance of policy needs to be evaluated according to its effects on this measure. From such a standpoint, other

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objectives, such as yield improvements, are proxies (substitutes) for welfare improvement.

From the standpoint of economic analysis, goals 2, 3, 4, 5 and 6 are legitimate policy goals in so far as their attainment corresponds to an improvement in economic efficiency. However, none of these goals is of value in its own right, and none is worth achieving at any cost.

Take the case of self-sufficiency. To the extent that price supports stimulate production and restrain demand, they have had the effect of promoting self-sufficiency. On the surface, therefore, this looks like a case of policy success. But at what cost is this success achieved? In the first place, there are the welfare costs of government intervention. Second, Turkey has, by definition, a comparative advantage in some activities but not in others. The gains from trade could be realised by having market prices direct the allocation of resources, with Turkey exporting those commodities in which it has a comparative advantage and importing those commodities in which it does not. There is no evidence that, except under extreme conditions such as war, the gains from reduced risk offset the losses from distortions to trade. In the case of Turkey, no attempt has been made to quantify the risk or provide empirical support for the argument.

In short, Turkey deploys a wide range of agricultural policies. In economic terms, these policies centre around stated objectives that are, at best, poor proxies for legitimate economic goals. Moreover, there is no clear link between legitimate goals and policies that address those goals. Instead, Turkey adopts policies for which it is possible to claim consistency with stated policy objectives.

3.5. Social dimension of agricultural policy intervention

It is sometimes argued that the emphasis on economic criteria misses the point -- that agricultural policy has a social dimension that traditional economic arguments ignore. Objectives such as improving the level of income inequality or reducing the social tensions that arise from the process of structural adjustment (as may be generated by rural-urban migration) may be just as, if not more, important than improving aggregate economic welfare.

Two points need to be made in respect of this argument. The first is that, although

a number of policy objectives might be termed 'social,' they are nevertheless amenable to measurement and analysis in monetary terms (Winters, 1990). Alternative policies can be compared according to how effective a given amount of resources is in achieving a specific social objective. Put another way, social policies can be considered as economic policies, to the extent that they have to be paid for.

The second point is that if a social function is claimed for policy, then the criteria according to which this objective is pursued must be made explicit. If, for example, redistribution is considered to be desirable, then it should be made transparent who qualifies for support and why, and who is expected to pay for that support.

The social objectives of Turkish agricultural policy

Referring back to the list of stated policy goals, 1 and 7 might be described as social goals, while a social dimension might also be claimed for goals 4 and 5. Unfortunately, as with the economic objectives, these goals are not articulated in a way that makes them amenable to policy analysis. Each goal is stated in absolute terms and without reference to the resource cost involved. The degree to which a goal such as "developing rural areas" provides a practical guide to policy is questionable when improving infrastructure in urban areas is also a priority. Similarly, "improving agricultural incomes" has no particular importance when policy is concerned with the incomes of all households.

3.6. Policy goals and an agenda for analysis

An agenda is thus developing for an examination of policy that focuses on legitimate policy goals, and in particular on the social dimension (distributional implications) of policy.

The welfare consequences of price policies and other coupled measures have received extensive treatment in the literature. The efficiency costs of price supports, input subsidies and border measures have been documented in general terms, and measured in the case of Turkey (UN-FAO, 1997; World Bank, 1997; Kasnakoğlu and Çakmak, 1998).

Yet, whilst the potential economic benefits from policy reform may be clear,

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policy change inevitably sets up a pattern of winners and losers. Policy-makers are understandably reluctant to recommend change in the absence of a clear picture of who wins, who loses, and by how much. Armed with such information, they can ensure that the losers are compensated, and balance economic criteria against issues such as "fairness" in the distribution of income and political feasibility.

This makes it particularly important to examine the distributional impacts of agricultural policy. Not least, such information actually helps policy-makers to specify their objectives in a more meaningful fashion. If the effects of policy on the incomes of agricultural households can be characterised, and the linkages from the agricultural sector to the rural economy and beyond traced out, then it becomes transparent whether the change in the distribution of income conforms to a defensible set of 'social values'. More importantly, if the analysis provides disaggregated information, then policy objectives can be articulated in a more precise manner. The criteria for support can be established, and the intended beneficiaries identified and targeted.

3.7. The efficiency of current policies in achieving social goals

The economic consequences of Turkish agricultural policy have received considerable scrutiny from international organisations (including the World Bank, 1997; the UN Food and Agriculture Organisation. 1997; and the OECD, 1997), as well as from independent academics (Kasnakoğlu and Çakmak, 1998).

In this study, we consider the implications of policy liberalisation in terms of what it would imply for the distribution of income. This provides an appropriate starting point for an examination of whether the social objectives of Turkish agricultural policy are being met. Goals such as "developing rural areas" (7) may not relate purely to income levels, but they are unlikely to be realised in the event of a shortfall in rural incomes. An informative approach to the issue of income distribution is the analysis of "transfer efficiency."

3.8. Transfer efficiency analysis

The analysis of transfer efficiency is concerned essentially with the allocation of the benefits of government support. The 'transfer efficiency' of agricultural support measures how much of a dollar's worth of assistance actually benefits the agricultural household. The conclusion of this analysis has been that output-related support mechanisms are relatively inefficient, and that decoupled instruments such as direct income payments have the potential to deliver more efficient assistance to farm households. A broad quantification of transfer efficiency further suggests that as little as one-fifth of the benefits of market price support may accrue to farmers (OECD, 1994).

The general question raised by these calculations is that if such a small proportion of assistance benefits farm households, then where does the rest of the money go? The sources of transfer efficiency loss can be divided into economic efficiency losses and distributive leakages (reallocations) within the food system. Leakages within the food system are likely to be numerically more important. These depend not just on the structure of the agricultural sector, but on the characteristics of the food system in general.

The transfer efficiency of alternative support policies has been seen to vary substantially according to a number of structural factors. For example, when price support is extended to the farm household, the net income benefit will depend on the extent to which input costs increase with farm output. The magnitude of the cost increase will depend on the share of inputs purchased from off-farm sources, how that share changes with increases in output and the degree to which input prices are driven up by the increase in demand. Other structural factors determining the allocation of the costs and benefits of support include the pattern of land ownership and the proportion of income derived from farming as opposed to non-farm activities. In each case, what matters is the share, the responsiveness of that share to increased output, and the degree to which relative prices change. To the extent that no agriculture-specific policy is perfectly decoupled from production, these structural characteristics exert a determining influence on the transfer efficiency of agricultural policies in general.

Structural data on the characteristics of the agricultural sector (e.g. the sources

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of farm household income, purchased input usage and competitive structures up- and downstream from the farmgate) may give some indication of the transfer efficiency of support within the economy. In addition, information on the structural distribution of policy benefits may provide further insight into the transfer efficiency of existing support policies.

The general policy issue becomes one of ensuring that policy benefits reach the intended recipients and are not dissipated to unintended ones. In line with this interpretation, it is important to note that part of existing transfer efficiency calculations may include benefits to farmers who are not deemed to be part of the target group. Equally, they may not include indirect benefits to rural non-agricultural households that the government would like to support.

Yet the objective of policy cannot be simply to improve the efficiency with which agricultural support raises farm incomes. As farmers adapt to changing economic circumstances by diversifying their income sources, diversifying their use of inputs and in some cases exiting the sector, so the transfer efficiency of farm level support falls.[3] It is obviously perverse to improve transfer efficiency by impeding or reversing structural change. A policy relevant view of transfer efficiency therefore needs to identify the target groups of assistance, and ensure that transfers to these groups are effected in the most efficient way possible. It is significant that the transfer efficiency of decoupled policies is higher than that of market price support; that transfer efficiency falls as the level of assistance increases; and that transfer efficiency is impeded by imperfectly competitive markets. Targeting, market orientation and competition policies each have their own theoretical and practical rationale. Improved transfer efficiency complements these objectives.

The transfer efficiency of direct income payments

Taxpayer-financed transfers induce two types of distortion. The first is the deadweight cost of raising revenues through income taxes; the second is the deadweight cost of disbursing taxpayer funds to farmers. These are "income effects", corresponding to consumption and production distortions respectively. Estimates of

[3]In the case of sector exit, the transfer efficiency of farm level support drops to zero. Formally, however, these farmers would drop out of the calculations.

the size of these losses vary substantially. Browning (1987) suggests that the distortionary impact of raising government revenues from an income tax lies in the range of 20 to 50 percent; while Fullerton (1991) puts the cost in the range of 7 percent to 25 percent. In addition, there are the production distortions associated with disbursing these revenues.

Notwithstanding these losses, direct transfers are likely to be less inefficient than market-based methods of intervention. In the first place, it may be inappropriate to calculate the marginal costs associated with raising tax revenues. The *average* cost of raising these revenues is likely to be much lower, and these figures may be more relevant. In general, it seems reasonable that taxation policy should be taken as external to the agricultural policy debate, in which case the average cost should be considered.

A second reason for preferring decoupled payments is that policies that distort production decisions by altering prices introduce distributive leakages throughout the food chain. Most estimates suggest that these losses are numerically much greater than the losses from raising and disbursing, and administering, taxes.

Third, agricultural policies need to be measured in terms of their ability to achieve defined objectives. Since direct payments are capable of superior targeting, the losses are smaller, if not in terms of strict transfer efficiency measures, then certainly in terms of less income being transferred to non-target groups. Non-targeted beneficiaries might include upstream and downstream organisations, farmers with relatively high incomes. Moreover, support levels can be adjusted more easily under a system of targeted assistance. A temporary support programme may yield greater transfer efficiency, since farmers are less likely to defer decisions on whether to exit the sector. Those remaining within the sector, and receiving payments, are likely to be those with fewer opportunities for diversifying their incomes or exiting the sector. Against this, temporary programmes may have the dynamic effect of making farmers more adaptable; a factor which will reduce transfer efficiency.

Finally, insofar as direct payments lead to smaller distortions in production and consumption decisions, they are likely to have a less distorting impact on trade patterns. This in turn implies fewer tensions in international trading relations. The

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importance of this issue is implicit in the green box and blue box distinctions of Uruguay Round GATT agreement.

The formally articulated goals of Turkish agricultural policy refer directly to the incomes of farm households and the livelihoods of farm and rural households. The attainment of these goals requires disaggregated structural data on the economic conditions of these households. Average numbers on incomes, farm size etc. tell us very little about how effective agricultural policy is at achieving its targets. Structural data on income sources is necessary to measure the performance of policy in terms of its ability to serve recognised objectives. At the same time, transfer efficiency varies according to structural characteristics, principally because these characteristics affect the nature of distributive leakages through the food system. An examination of how the distribution of income varies according to structural characteristics is therefore central to reconciling policy priorities with the need to deliver support in an efficient manner. The methodology of this study (detailed in the following chapter) focuses explicitly on providing a disaggregated portrayal of the likely effects of policy reform.

3.9. Explicit Versus Implicit Policy Goals

The agricultural policies adopted in Turkey have been criticised for their adverse impacts on economic welfare and their questionable effects on the distribution of income. For many years, the same criticisms have been levelled at nearly all OECD countries. Indeed, agricultural policies in both developed and developing countries throughout the world have long been criticised by economists. Given the consensus of professional opposition to output related support mechanisms, it is important to explain the continued adoption of such policies.

The political economy perspective is that policy outcomes arise effectively as political responses to the demands of people who are economically affected by those policies. In other words, agricultural (and other) policies are determined by politics, rather than as a reaction to the advice of expert economists. The agricultural policies of the developed world achieve questionable redistributive goals at great cost to consumers and taxpayers (while severely disrupting world markets). The political economy perspective suggests that these policies exist not because they improve

economic welfare, but primarily because the beneficiaries are more effective in exerting political pressure than the losers. Whereas the gains to producers are concentrated over a small proportion of society (and account for a significant proportion of their incomes), the losses are spread diffusely over a much larger number of consumers and taxpayers. Producers therefore have a greater ability and incentive to mobilise politically, while consumers and taxpayers tend to be less effective because the potential gains are not worth the costs of political effort, and it is too easy to "free-ride" on organised political activity.

The political economy paradigm has been articulated in a number of different ways (Stigler, 1971; Peltzman, 1976; Becker, 1983). The common assumption of all the different representations is that politicians act exclusively out of self-interest. In a democratic context they are motivated primarily by the goal of re-election. This means that they will intervene with policies that either elicit more votes directly, or draw other resources (such as money) that can be used to obtain votes indirectly (although such resources may be valued in their own right).

The political economy paradigm is a "cosmopolitan" explanation of policy insofar as it abstracts from cultural and historical factors, and from institutional specifics. It recognises that everyone has a stake in the outcome of government policy, either as a recipient of policy or as one who pays for it. But it is the ability of affected groupings to organise collectively around common interests that determines their political power. This body of theory has proven successful at explaining a broad range of policy interventions, in agriculture and elsewhere (Peltzman, 1989). Its greatest weakness is that it admits no room for political independence (or "courage"). Yet political pressure has been faced down on occasions, and the Western experience of policymaking offers many examples of decisions that could easily have gone the other way. Notwithstanding this weakness, the political economy paradigm can provide important insights into the demands that are likely to be made on politicians as they attempt to forge agricultural policies.

One important issue relates to that of transparency. Price supports, input subsidies and accompanying border measures may be more expedient politically than taxpayer-financed transfers because it takes more investigative effort by consumers

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for them to be aware of the implied reduction in their real incomes.

An implication of the political economy perspective is that politicians are forced into claiming that policies that are dictated by political considerations are actually an attempt to pursue the officially articulated goals of policy. The vagueness of official policy statements makes such obfuscation possible, since it is possible to claim a loose consistency between adopted policies and stated policy goals. For this reason, it is important that policy goals are defined clearly and that alternative policies are compared in terms of their effectiveness in achieving these goals. A fresh articulation of the problem, and a comparison of the alternative solutions, provides some hope that politicians may be tied to explicit objectives rather than implicit constraints.

3.10. Conclusion: An Agenda for Policy Analysis

The forgoing analysis suggests the following agenda for agricultural policy analysis in Turkey:

First, the stated objectives of Turkish agricultural policy cannot form the basis for an appropriate analysis of policy performance. Some of the goals are of questionable merit (e.g. increasing production and increasing self-sufficiency), while others are too imprecisely articulated to be practically useful (e.g. maintaining the health of rural communities). Instead, Turkey's policy goals need to be reconfigured according to efficiency criteria and explicitly stated social objectives.

The performance of Turkish agricultural policy needs to be measured according to its ability to deliver on these goals. A considerable volume of work has established that current agricultural policies impose large economic costs on the Turkish economy (World Bank, FAO, Kasnakoğlu and Çakmak).

Political economy analysis suggests that and implicit objectives often dominate explicitly stated goals, but that policy-makers defend existing policies by appealing to the consistency between policy and stated objectives. The vagueness with which policy goals are articulated makes such obfuscation possible. If the goals of policy can be reformulated in ways that make the performance of alternative policies measurable and comparable, then this increases the likelihood that the policy process can be tied to legitimate criteria rather than political expedience.

There is substantial evidence to suggest that decoupled agricultural policies,

such as direct payments, can deliver income assistance more effectively than market based measures such as price supports, input subsidies and border measures. Not only do direct income payments induce fewer economic distortions than policies under which support is tied to production, they also means that support can be targeted to deliver the desired distributional effect.

However, the exact distributional consequences of any change in policy depend fundamentally on the structure of the agricultural sector, and on the linkages between agriculture and the rest of the economy. These factors must be examined in order to establish the detailed pattern of winners and losers that is likely to be generated by policy reform. They may also serve as a first step to the development of a database according to which eligibility for support can be established.

In the following section, we set out the methodology of our study. We use a multi-market model (a Social Accounting Matrix) to measure the extent to which agricultural markets adjust to policy change and to trace out the broader effects on the distribution of income throughout the economy.

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4. THE SOCIAL ACCOUNTING MATRIX FOR TURKEY

4.1. The Social Accounting Matrix Methodology

Multi-Market Models

The economic effects of government intervention in a particular sector are unlikely to be confined to that sector. In the case of agricultural policy, the effects of government support may have knock-on effects for both upstream sectors (such as fertiliser producers and suppliers of other inputs) and downstream sectors (including the whole food processing industry). Similarly, agricultural households may spend a proportion of an increase in their incomes on buying goods and services from local non-agricultural households. In general, the effects of a specific intervention can reverberate through the economy, affecting all sectors and households to some degree. Only a multi-market model can capture such broader linkages.

Within a multi-market model, there are no set rules for disaggregating the transactions between different agents in the economy. The appropriate choice depends on the effects of interest. In this study, we are particularly concerned with the linkages within the agricultural sector, and between agriculture and the rest of the economy. At the household level, we are concerned with how households at different levels of income are affected, and with the linkages between agricultural and non-agricultural households. Sufficient data exist to break down the analysis by region. At this stage, however, our analysis is confined to the national level.

The Structure of the Social Accounting Matrix

The multi-market model used in this study takes the form of a Social Accounting Matrix (SAM). A SAM is simply a square matrix in which the expenditures on each 'account' are recorded in the columns, and the receipts on each 'account' are recorded in the rows. As each account must balance, the corresponding row and column totals must equate. A SAM typically has six categories of account:

- Activity (production) accounts
- Commodity accounts
- Factor accounts

- Institutional accounts (including households and government)
- Capital accounts
- Rest of the world accounts

In the case of Turkey, it is not possible to separate the outputs and inputs of different industries according to the commodities they 'make' and 'use'[4]. Since all transactions are measured at the industry level, the 'activity' and 'commodity' accounts are consolidated into a single 'productive sectors' account.

Within each category there can be numerous individual accounts. In this study, the emphasis is on providing detail on the agricultural sector in the productive sectors category, and on disaggregating agricultural and non-agricultural households according to income level within the 'institutions' category.

A SAM is first and foremost a framework for organising economic data. It describes the circular interdependence of, among other accounts, production, factor incomes and institutions (including, businesses, households and government). For example, in a closed economy, production generates value added, which is paid as wages and rent to factors of production. These incomes are then payable to institutions (such as households and the government). The incomes of institutions (after redistribution) are saved or spent on commodities. The circle is closed when this consumption leads to production. The entries in the aggregate Turkish SAM are presented in Table 4.1. Note that, whilst the linkages get more complicated as more detail on the economy is provided (for example on the capital account or in the specification of international trade), the principle of a circular flow of income remains the same.

In the above SAM, the relationships between the categories of account are as follows:

- The **productive sectors** buy intermediate inputs and hire factors to produce goods and services. Expenditures include the purchase of domestic and imported intermediate goods. The difference between the value of output and the values of

[4] The distinction between industries and commodities is meaningful in the presence of a MAKE matrix (which measures the commodities made by different industries) and a USE matrix (which measures the consumption of these commodities by the same range of industries). These matrices have not been

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the purchased inputs constitutes value-added. Part of this is paid to government in the form of taxes, while the rest is paid to factors (labour and capital) in the form of wages or rent, or retained as profit. The receipts of the productive sector accounts correspond to the sum of intermediate demand, final demand, investment and exports.

- **Factors** (labour and capital) receive income in the form of wages, rent, profit and remittances from abroad. Their revenues are distributed (after taxes) to households as labour income and distributed profit, and to firms as non-distributed profit.
- **Households** receive incomes from factors and transfers from the government, firms and overseas remittances. Their expenditures consist of consumption, taxes, transfers and savings (which are paid to the capital account). In this study, households are disaggregated according to whether their income derives principally from agricultural or non-agricultural activity, whether they are located in urban or rural areas and according to their income level.
- The **government** receives income from taxes and transfers from abroad, which it spends on consumption and transfers (including subsidies). Government deficits are represented as a negative transfer to the capital account.
- The **capital account** represents the balance of savings and investment across all categories of account.
- On the **rest of the world (ROW)** account, foreign exchange earnings derive from exports, factor incomes from abroad, payments from overseas and capital transfers. These earnings are spent on private and public imports and on overseas transfers.

A SAM does not, by itself, constitute an economic model. For that, the economic relationships that drive the circular flow of income must be specified. The specification that underlies economic analysis using the SAM is the Leontief model. Leontief technology underpins the basic input-output model, of which the SAM is an extension. The structure of the basic input-output model is described in Table 4.2. Note that this corresponds to the "productive sectors" rows and column in the SAM

compiled for Turkey.

presented in Table 4.1.

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Table 4.1. Structure of the Social Accounting Matrix

	Sectors	Factors	Households	Government	ROW	Capital Account	Total
Sectors	Intermediate demand	0	Final consumption	Govt. Cons	Exports	Investment	***Total Demand***
Factors	Wages, rent, profit	0	0	0	Factor income from abroad	0	***Factor Income***
Households	0	Factor income	0	Transfers	Transfers from abroad	0	***Household Income***
Government	Indirect taxes	Taxes & Soc. Sec.	Direct taxes	0	Transfers from abroad	0	***Govt. Income***
ROW	Imports	0	0	Govt. imports	0	0	***Imports***
Capital Account	0	0	Household saving	Govt. saving	Capital transfers	0	***Total Saving***
Total	***Total Supply***	***Factor Outlay***	***Household Exp's***	***Govt Exp's***	***F. Exch. Earnings***	***Total Investment***	

Table 4.2. The Input-Output Table

		Sectors (j)				
		1	…	n	Final demand	Total demand
Sectors (i)	1	P_1X_{11}	…	P_1X_{1n}	P_1F_1	P_1X_1
	n	P_nX_{n1}	…	P_nX_{nn}	P_nF_n	P_1X_n
Value added	1	W_1L_{11}	…	W_1L_{1n}		
	s	W_sL_{s1}		W_sL_{sn}		
Other		P_1		P_n		
Taxes		T_1		T_n		
Total Supply	s	P_1X_1		P_nX_n		

Unit price of sector *i*'s output, $i = 1,\ldots,n$.
Output of sector I sold to sector j as intermediate input, $i, j = 1,\ldots,n$.
Final demand for sector *i*'s output, $i = 1,\ldots,n$.
Total supply of sector *i*, $i = 1,\ldots,n$..
Unit price of labour *k*, $k = 1,\ldots,s$.
Amount of labour k used in sector *j*, $k = 1,\ldots,s$; $j = 1,\ldots,n$.
Profit in sector *j*, $j = 1,\ldots,n$.
Indirect taxes, including tariffs, paid by sector *j*, $j = 1,\ldots,n$.
Source: Sadoulet and de Janvry (1995), p.285.

The underlying assumption of the Leontief model is that output from a given sector requires fixed and constant proportions of inputs from the other sectors. In other words, the amount of sector *i*'s output required as an input into the production of sector *j*'s output is assumed to be proportional to sector *j*'s output X_j.

If we define a_{ij} as the amount of sector *j*'s output required to produce one unit of sector *i*'s output, then we can write

(1) $a_{ij} = X_{ij}/X_j$

The equilibrium between supply and demand for each sector can be written

(2) $X_i = \Sigma X_{ij} + F_i \quad i = 1,\ldots,m$

where X_{ij} is intermediate demand and F_i is final demand.

This can be written

(3) $X_i = \Sigma a_{ij}X_j + F_i$

In matrix form, we can denote A as the $m \times m$ matrix of input-output coefficients, a_{ij}; F as the

$m \times 1$ vector of final demands; and X as the $m \times 1$ vector of outputs, X_i. Equation (3) can then be written:

$X = AX + F$, or

(5) $(I - A)\, X = F$

This relationship also applies to changes in X and F. Provided that $(I - A)$ is non-singular, we can derive the changes in sectoral output which result from a change in final demand:

(6) $\Delta X = (I - A)^{-1} \Delta F$

where I is the $m \times m$ identity matrix. The matrix $(I - A)^{-1}$ is called the Leontief Inverse Matrix and gives the input-output multipliers.

These multipliers form a key focus of the analysis in this study. They can be understood intuitively in terms of equation (3). An increase in the final demand for the output of a given sector i, say by ΔF_i, increases production initially by the same amount $\Delta X_{i1} = \Delta F_i$. However, this raises the intermediate demand for the output of all sectors, including i itself, by $\Delta X_{j2} = \Sigma a_{ji} \Delta X_{i1}$. To produce these intermediate inputs, more intermediate inputs are need, increasing the output of X_j by a further $\Delta X_{j3} = \Sigma a_{ji} \Delta X_{i2}$. The process continues, with the magnitude of further effects becoming progressively smaller.

Returning to the matrix notation, the Leontief Inverse Matrix can be expressed as a converging expansion

$(I - A)^{-1} = I + A + A^2 + A^3 + \ldots..$

Thus, from (5)

$\Delta X = \Delta F + A\Delta F + A^2\Delta F + A^3\Delta F + A^4\Delta F \ldots\ldots$

This expression shows how the interdependency between sectors is reflected in a series of progressively smaller boosts to final demands. Crucially, changes directed at one particular sector (say agriculture, or a subset of agriculture) will have implications for most other sectors. Partial equilibrium models, such as those used to examine the transfer efficiency of agricultural support, typically ignore these implications.

The assumptions of linear production functions and zero substitution possibilities are major limitations of this approach. The practical importance of these limitations is discussed later in the section. At this stage, however, it is sufficient to note that the input-output framework provides an informative guide to the potential linkages between and within sectors.

In practical terms, how do we measure these multipliers? The basic input-output matrix, and the extended input-output matrix (i.e. the SAM) contain data reported in values rather than quantities. If we compute the coefficient m_{ij} as the ratio of the corresponding cell of the input-

output matrix to the column total, then each coefficient is defined by $(p_i/p_j)*(X_{ij}/X_j)$. In other words, m_{ij} is equal to the relative price (p_i/p_j) times the technical coefficient a_{ij}. If we define M as the matrix of m_{ij} coefficients, then $(I - M)^{-1}$ gives the matrix of income multipliers for the input output table. Since prices are fixed in the Leontief system, these correspond to output effects (valued at current prices).[5]

The SAM as a Tool for Policy Analysis

In a standard Leontief input-output model, final demand is exogenous, technology is given by the technical coefficients and gross output is determined endogenously. The extension of this model to the SAM framework is performed, analogously, by partitioning the accounts into endogenous and exogenous accounts and assuming that the column coefficients of the endogenous accounts are all constant.

The standard choice is to make one or more of the government, capital and rest of the world accounts exogenous. This imposes the restriction that expenditures on these accounts are independent of the level of income. The partitioned SAM can be written schematically as in Table 4.3.

Here, X is the vector of total income or expenditure of the endogenous accounts, F is the vector of expenditures of the exogenous accounts, L is the column vector of the income of the exogenous accounts, M is the square $n \times n$ matrix of coefficients of the endogenous accounts, and B is the $m \times n$ matrix of coefficients with exogenous accounts as rows and endogenous accounts as columns.

Table 4.3. Partioning of theSAM Matrix

		Expenditures		
		Endogenous accounts (n)	*Sum of exogenous accounts (1)*	*Total*
Receipts	*Endogenous accounts (n)*	*MX*	*F*	*X*
	Exogenous accounts (m)	*BX*	*L*	
	Total	*X*		

Source: Sadoulet and de Janvry (1995).

[5] Note that prices in this model are independent of the level of production. That is, supply is assumed to be perfectly elastic at the cost price and output exclusively demand determined. If we choose the units of each output or input such that the price is equal to one, then quantities can be replaced by

Given a vector of exogenous shocks, ΔF, the vector of impacts is given by $\Delta X = (I - M)^{-1} \Delta F$, where $(I - M)^{-1}$ is the matrix of SAM multipliers. The vector of "leakages" is given by $\Delta L = B \Delta X$. Leakages may include induced savings, government revenues and imports (depending on which accounts are exogenous).

Since the endogenous accounts of the input output-table constitute a subset of the endogenous accounts of the SAM, it is possible to compare the input-output multipliers (evaluated at current prices) with the corresponding cells in the matrix of SAM multipliers, $(I - M)^{-1}$. The difference gives the demand stimulus induced by broader macroeconomic linkages.

These multipliers can be decomposed in order to examine the effects of interest. The particular focus of this study is on the sectoral linkages between agriculture and the rest of the economy and on the linkages between different categories of household. Agricultural policy intervention provides income, initially to agricultural households (as well as to other households supplying the agricultural sector). The linkages from these households to other households (in particular rural but non-farm households) are considered explicitly in the results section. The decomposition of the matrix of total multipliers is detailed in the appendix.

A problem with the SAM approach is that, whilst it can capture the linkages induced by income transfers (making it a useful tool for examining the effects of income redistribution through a programme of direct transfers to agricultural households), it cannot account for the effects of changes in relative prices. For example, price supports tend to stimulate production and thus the demand for purchased inputs. If these inputs are not in perfectly elastic supply, the prices of these inputs will be bid up. The end result will be an increase in the value of purchased inputs, with the effects on prices and quantities dependent on a number of factors, including the elasticity of input supply and the elasticity of substitution between farm and off-farm factors.

The results of the SAM should therefore be seen as broad estimates of *potential* output effects, with some of these effects likely to be absorbed in the form of higher prices.

4.2. Incorporating Policy Responses into the SAM

All policy changes must be fed into the SAM as exogenous shocks. In this study we model policy as changes to the pattern of government expenditures. Thus, price supports are treated as government transfers to the corresponding productive sector account, input subsidies are modelled as transfers to the factor accounts and direct payments are measured as transfers to

values when calculating the input-output coefficients.

the household accounts.

The chief limitation of the SAM approach relates to the assumption of fixed coefficients. This means that there is excess capacity in all sectors and increases in demand can always be met by higher output with no price increases. One implication is that the effects of reduced government intervention on the level of economic activity are exaggerated. In practice, the reallocation of resources to other uses will mitigate the effects of fiscal contraction. This limitation can be partially overcome by making transfers fiscally neutral (i.e. distributing the budgetary gains evenly across other accounts).

Although the assumption of excess capacity is restrictive, it can be defended on the following grounds:

1. The SAM represents a transparent and readily intelligible way of examining the induced linkages arising from changes at the household level. Although the assumption of Leontief technology limits the usefulness of the model as a predictive tool, it nevertheless provides an indicator of potential effects and the possible sources of supply bottlenecks. Intuitively, the output effect can be thought of as a potential effect, with some of this effect actually absorbed in the form of higher prices.
2. The SAM approach represents a level of sophistication that is commensurate with the quality of the data. Econometric analysis is germane to the analysis of household decisions where detailed survey data exist, but the mapping of these changes onto macroeconomic outcomes entails the use of different data sources, different levels of aggregation that may make comparisons suspect, and some estimation of data. A number of these relationships may not be amenable to econometric analysis.
3. The SAM approach provides greater transparency than would a CGE model. In particular, it is possible to focus on the household effects of interests and then on the induced linkages with the rest of the economy. These separate effects tend to become confused in the "black box" outcomes of a CGE model.

4.3. Model Specification (Structure of the SAM)

The SAM takes the general form outlined in Table 4.1. The nature of the disaggregation reflects our interest in the interrelationships between agricultural and agriculture-related sectors (both upstream and downstream), and agricultural and rural households. The entries for the matrix are estimated for 1995, using 'hard' 1995 data where possible. In the cases where cross-section survey data are needed, the structure of the most recent survey is assumed to hold, with the entries adjusted to exhaust known 1995 totals. Thus, the IO table of intermediate demands is constructed using data from a 1990 survey, while household incomes

and expenditures are allocated using data from a 1994 survey.

The productive sectors, factors and household categories are disaggregated as follows:

Productive Sectors. Total production is divided into 28 accounts. In general, these categories are derived from the 64 sector 1990 Input-Output (I-O) Table. The agricultural, food and agricultural input sectors are kept at the maximum level of disaggregation, while other sectors, including industry, services and power are consolidated. Field crops are further disaggregated into four sectors – cereals and pulses, hay and straw, fruit and vegetables and other field crops (this division reflecting the availabality of date on outputs, inputs and value added. The input-output coefficients for these sectors were estimated in such a way as to preserve consistency with the 1990 I-O Table. The complete listing of the 28 sectors is given in Table 4.4. (the numbers in parentheses correspond to the equivalent entry in the 1990 I-O table).

Factors. Wages, rent and profit are reported, with the latter differentiated according to whether it derives from agricultural or non-agricultural activity.

Households. Households are identified according to three criteria: whether they are agricultural or non-agricultural; whether they are located in rural or urban areas; and according to their income decile within that particular group.

Table 4.4. Disaggregation of Accounts in the 1995 SAM

Productive Sectors* **(28)**	**Factors (4)**	**Households (20)**	
Cereal & pulses [1]	Labour	Agricultural and rural	0-20%
Hay & straw [1]	Capital		21-40%
Fruit & veg [1]	Agricultural profit		41-60%
Other field [1]	Non-agricultural profit		61-80%
Livestock [2]			81-100%
Forestry [3]		Agricultural and urban	0-20%
Fisheries [4]			21-40%
Mining [5, 7-10]			41-60%
Slaughter [11]			61-80%
Canning [12]			81-100%
Oils & fats [13]		Non-agricultural and rural	0-20%
Grain products [14]			21-40%
Sugar [15]			41-60%
Other food [16]			61-80%
Alcohol [17]			81-100%
Soft drinks [18]		Non –agricultural and urban	0-20%
Tobacco [19]			21-40%
Textiles [20-22]			41-60%
Leather [23-24]			61-80%
Wood [25-28]			81-100%
Fertiliser [29]			
Agricultural machinery [43]			
Petroleum refineries [32]			
Industry [30-42, 44-49, 52-53]			
Crude Petroleum [6]			
Power [50-51]			
Transport [56-60]			
Services [54-55, 61-64]			

*Numbers in parentheses show the corresponding sector(s) in the official 1990 input-output table.

The result of these disaggregations is a 55 × 55 SAM which can be broken down into the sub-matrices shown in Table 4.5.

Table 4.5. Dimensions of Sub-Matrices in the 55 × 55 SAM

		Sectors	Factors	Households	Government	Rest of World	Capital Account	**TOTAL**
		1	2	3	4	5	6	
Sectors	1	28 × 28		28 × 20	28 × 1	28 × 1	28 × 28	**28 × 1**
Factors	2	4 × 28				4 × 1		**4 × 1**
Households	*3*		20 × 4		20 × 1	20 × 1		**20 × 1**
Government	4	1 × 28	1 × 4	1 × 20				**1 × 1**
Rest of World	5	1 × 28			1 × 1			**1 × 1**
Capital Account	6			1 × 20	1 × 1	1 × 1		**1 × 1**
TOTAL		**1 × 28**	**1 × 4**	**1 × 20**	**1 × 1**	**1 × 1**	**1 × 1**	

4.4. Data Sources for the SAM Accounts

The data sources used to estimate the 1995 SAM are as follows.

Productive Sectors: 1990 IO Table, 1995 National Income Accounts, own estimates of agricultural technology.

Factors: 1990 IO table, 1995 National Income Accounts, estimates of agricultural technology.

Households: Income data from the 1994 Income Distribution Survey. Expenditure data from the 1994 Household Expenditure Survey.

Government: Revenues and expenditures from the 1995 Consolidated Balance Sheet (published by the State Planning Organisation).

Trade: Balance of Payments statistics (SIS) and 1995 National Income Accounts.

Capital: Investment comes from the 1995 National Income Accounts, savings are obtained from the other accounts.

On the ***Productive Sectors*** accounts, the 1990 Input-Output table provides the basis for the disaggregated estimation of revenues and expenditures. Data from the 1995 National Income Accounts provide updated estimates for gross value added by sector (which is recorded as payments to factors in the SAM) and final expenditures. Given updated numbers for output, inputs and value added, we derive a new matrix for intermediate demand. The RAS methodology is then used to obtain an udated technology matrix.

The national income accounts provide totals for each of the components of final demand, while private consumption can be disaggregated by sector using data from the 1994

Income Distribution Survey. Disaggregated trade data are available from the Central Bank and from the 1995 Foreign Trade Statistics.

Factor payments are equal to gross value added at factor cost. The division between salaries and wages, rent and profit is assumed to reflect the 1990 breakdown, with the payments from each factor adjusted by the same proportion to exhaust the aggregate shares given in the 1994 Income Distribution Survey. The distinction between agricultural and non-agricultural profit is made according to whether the sector is agricultural or not.

These factor payments are allocated to **households**. Data on the distribution of these factor incomes is obtained from the 1994 Income Distribution Survey. This distribution is used to allocate the 1995 totals obtained from the National Income Accounts' data on value added.

Household expenditures must similarly exhaust the 1995 totals. The 1994 Household Expenditure Survey is used to distribute the expenditures on the output of each sector according to the category of household. The profile of expenditure differs from that obtained via the updated Input-Output table.

4.5. Specific Assumptions Underlying the 1995 Social Accounting Matrix

The 1995 IO table.

The key assumptions underlying the updated 1995 IO table are as follows:

- Data on gross value added (which correspond to factor payments in the SAM) are taken from 1995 GNP data.
- Data on final demand are updated to 1995 by allocating the totals given in the 1995 GNP tables.
- Exports and imports are allocated using trade data from the Central Bank and the 1995 Foreign Trade Statistics.
- The private consumption shares of each category of household are updated using data from the 1994 Household Expenditure Survey. In terms of the SAM, the 28 × 1 vector of final demands is allocated across the 20 categories of household, leading to a 28 × 20 matrix.
- Net indirect taxes are equal to the difference between gross value added at producer prices and gross value added at factor cost.
- Intermediate demand is assumed to be the same proportion of total supply as in 1990, with the RAS methodology uesd to update the technology matrix.

The 64 sectors in the 1990 IO table are mapped onto 28 sectors which reflect the study's focus

on the agricultural sector and related upstream and downstream sectors. In the case of the agriculture, the values of inputs and outputs for the sector are allocated across four new categories: cereals and pulses, hay and straw, fruits and vegetables, and other field crops. These categories correspond to the level of disaggregation of data on sectoral value added (as given in the national income accounts). All the other categories in the 28 sector IO table are aggregations of accounts contained in the 64 sector IO table. The exact mapping of the 64 sectors onto 28 is given in Appendix I.

The assumptions underlying the attribution of agricultural inputs and outputs to the four agricultural sub-sectors are as follows:

Agricultural accounts to agricultural accounts

Within the 4 × 4 matrix of inputs from agricultural accounts to agricultural accounts we assume that all the input into cereals and pulses comes from within the account (i.e. there is no input from hay and straw, fruits and vegetables or other field crops). All the input into hay and straw comes from cereals and pulses, while inputs into and outputs from the fruit and vegetables and other field crops accounts occur exclusively with the accounts.

Non-agricultural accounts to agricultural accounts

In the case of textiles' input into agriculture, we rule out any allocation from hay and straw or fruits and vegetables.

Agricultural accounts to non-agricultural accounts

- The slaughtering industry receives no input from the fruits and vegetables sector;
- All input into the canning sector comes from fruits and vegetables or other field crops (which includes sugar);
- All the input into the grain products sector comes from cereals and pulses;
- All the input into the sugar industry comes from other field crops;
- Other food crops receive no input from hay and straw;
- The alcohol sector receives inputs from cereals and pulses and fruits and vegetables;
- The soft drinks sector receives inputs from fruits and vegetables;
- The tobacco sector receives inputs from other field crops;
- The wood sector receives no input from fruits and vegetables.

Default assumptions

In the absence of any additional information about agricultural technology, we assume that (a)

inputs from non-agricultural sectors into each of the agricultural sub-sectors are equal to the input into total agriculture times the share of the subsector in total input usage; (b) the outputs from each of the agricultural sub-sectors to non-agricultural sectors are equal to the total output from agriculture times the sub-sector's share of agricultural value added.

Other SAM Assumptions

Payments from productive sectors to factor accounts

The figures for wages and salaries, rent and profit are akkcations of the 1995 data on gross value added at factor cost. The brekadown from the 1990 IO table is usde to exhaust the total shares given by the 1994 Income Distribtion Survey. In addition we assume that profit from the agricultural sectors is paid to agricultural profit and profit from the non-agricultural sectors is paid to non-agricultural profit.

Factor incomes and factor payments to households

Data on total factor incomes are obtained by adding the income received from each sector to the income received from overseas. The former comes from the IO table, the latter from the 1995 GNP accounts. We assume that all factor income from overseas is received in the form of non-agricultural profit.

Factor incomes are paid either to households or to the government in the form of taxes. The government accounts provide an aggregate figure for taxes levied on factors. This means that aggregate payments to households can be obtained as a residual.

This aggregate number is allocated to four categories (salaries and wages, rent, profit and agricultural income) using data from the 1994 Household Income Survey. These shares are then reconciled with the data from the updated IO table (which uses 1995 value added data). These four factor incomes are then allocated across the 20 categories of household using the data from the 1994 Household Income Survey (see earlier notes on the distribution of household incomes).

Finally, the allocation of the aggregate tax number to each factor account falls out as a residual.

Household incomes and expenditures

The figures for private consumption must exhaust the 1995 total (obtained from the GNP accounts). Data from the 1994 Household Expenditure Survey are used to allocate expenditures across sectors and across the 20 categories of household.

The distribution of expenditures to the 28 sectors by the different groups of households in the Social Accounting Matrix (SAM) for 1995 were estimated from the 1994 Household Income-Expenditure Survey (HIES) of the State Institute of Statistics (SIS). Households are differentiated into twenty income groups, in quintiles ordered by household income for agricultural and non-agricultural households in rural and urban areas.

Household consumption expenditures were estimated as follows:

- In the HIES, 67 percent of all expenditures were by urban households while 18 percent were attributable to agricultural households. The breakdown of expenditures by agricultural and non-agricultural households in rural and urban areas were estimated using the following percentages:

Table 4.6. Distribution of Household Expenditures

Expenditures	(percent)
Agricultural Household Expenditures	
Urban	0.02
Rural	0.17
Non-Ag Household Expenditures	
Urban	0.65
Rural	0.17

- From the HIES, households can be identified according to whether they fit the four categories described earlier, and according to income quintile. Agricultural households are defined as those households where the principal occupation of the household head is agriculture.
- The expenditure categories in the HIES were further disaggregated, to enable a mapping of these expenditures onto each of the sectors in the SAM. The shares in each sub-sector were given the weight accorded in the updated IO table.
- The 28 × 20 matrix of expenditures was computed by allocating the consumption shares from the HIES to the value of household expenditures reported in the 1995 GNP tables.

Total household incomes are obtained from the 1994 Income Distribution Survey and are equal to income from factors plus remittances from overseas (obtained from the SPO's Main Economic Indicators). The difference between income and expenditure is either saved or paid to the government in tax. We apply official tax rates to non-agricultural income (agricultural income is not taxed), but this results in an overall tax burden which is substantially higher than actual government revenues. Accordingly, we reduce the tax paid by each household by the same proportion such that the total tax burden is equal to reported government revenues. Household savings are then obtained as a residual.

Government expenditures

Government expenditures by sector are obtained from the updated IO table. Aggregate government transfers to households are obtained from the government balance sheet. The allocation of these transfers across the individual household accounts is made using shares from the 1994 Income Distribution Survey.

Capital account transactions

Investment (both aggregate and by sector) is obtained from the updated IO table. Household

savings were obtained as a residual from the household accounts, while the government (though SPO) provides data on its borrowing and savings (in this case, there is net borrowing, i.e. negative net saving). Accordingly, foreign borrowing, or overseas lending, falls out as a further residual that preserves the savings-investment identity.

Rest of the world transactions

Export data are obtained from the updated IO table. With government payments and receipts from the rest of the world already accounted for, and factor and household incomes from abroad obtained earlier, government borrowing from overseas (i.e. capital transfers) can be obtained as a residual.

4.6. Analysis of Turkish Agricultural Policy using the SAM

Within a SAM framework, the impacts of changes in government policy must be represented by changes in one of the exogenous components of final demand (government expenditures, investment or exports). In order to compare the impacts of alternative policies on each of the endogenous accounts of the SAM, a vector of net injections is pre-multiplied by the matrix of SAM multipliers in each case. The resulting vector gives the final impact on each endogenous account, including changes in the output of each sector and on the income of each category of household.

A policy of supporting prices at the farm level can be represented as an increase in the final demand for the output of these sectors. If this output is then sold on by the government to downstream industries, then the relevant increase in final demand occurs at the downstream (food industry) level. By contrast, direct income payments can be represented as exogenous payments to the household accounts. Rather than calculate the implied change that would result from liberalisation, the multipliers alone are reported. Given the linearity of the SAM framework, the multipliers can be used to calculate the effect of removing a given amount of one account (commodity price support) and replacing it with a payment to another account (direct payments tohousehold).

4.7. Summary

In this chapter we have demonstrated how the Social Accounting Matrix may be used to examine the distributional effects of agricultural policy reform in Turkey. In particular, we have specified the disaggregations that make it possible to discern the effects of reform on agricultural sub-sectors and related upstream and downstream sectors, and the subsequent effects of these changes on household incomes. We have also presented a method of incorporating policy that, whilst not overcoming all the limitations of the SAM framework, nevertheless captures the principal characteristics of coupled and decoupled support policies and allows the distributional impacts of these policies to be delineated.

5. RESULTS

In this section, we describe the principal attributes of the 1995 SAM, discuss its associated income multipliers and examine the implications of alternative policy reform options for the Turkish economy. Particular attention is given to the impact of agricultural policy reform on alternative categories of household.

5.1. Principal characteristics of the 1995 SAM

The aggregate SAM is presented in Table 5.1 below, while the following notes highlight the salient features of the aggregate accounts.

Table 5.1. The Aggregate SAM for Turkey, 1995 (Billions of TL).

	Sectors	Factors	Households	Government	ROW	Capital	Total
Sectors	5 678 789		5 457 903	837 243	1 001 123	2 115 341	**15 090 399**
Factors	6 722 683				92 431		**6 815 114**
Households		6 578 316		769 316	73 526		**7 421 158**
Government	1 039 773	236 798	512 136	261 321	-187 527		**1 862 501**
ROW	1 649 154	0	0	447			**1 649 602**
Capital		0	1 451 120	-5 827	670 048		**2 115 341**
Total	**15 090 399**	**6 815 114**	**7 421 158**	**1 862 501**	**1 649 602**	**2 115 341**	

Supply and demand shares

From the aggregate IO table, which corresponds to the first row and first column of the SAM, the components of supply and demand break down as follows:

Table 5.2. Supply and Demand Shares in the SAM

Demand Component	Share	Supply Component	Share
Intermediate consumption	37.6%	Total inputs	37.6%
Private consumption	36.2%	Gross value added	44.6%
Investment	14.0%	Net indirect taxes	5.0%
Government transfers	5.5%	Import duties	1.9%
Exports	6.6%	Imports	10.9%

National income

The components of national income break down as follows:

Table 5.3. Components of National Income in the SAM

Component of GDP	Value (millions TL)	Share
Private consumption	5,457,902,663	81.2%
+ Public consumption	837,243,290	12.5%
+ Private investment	1,545,795,948	23.0%
+ Public investment	304,429,093	4.5%
+ Stock changes	265,115,618	3.9%
+ Exports	1,001,123,478	14.9%
- Imports	- 1,649,154,021	-24.4%
- Import duties	- 284,130,002	-4.2%
- Net indirect taxes	- 755,643,144	-11.2%
GDP at factor cost	6,722,682,923	

Note that the vast majority of investment comes from the private sector.

Factors

Of total factor income, 98.7% comes from domestic value added, while 1.3% comes from overseas remittances. Of total factor outlays, 96.5% is paid out to households as income, while 3.5% is paid to the government in taxes.

Households

Of total household income, 88.6% comes from factor payments, 10.4% from government transfers and 1.0% from overseas remittances. Of total household expenditures, 73.5% is spent on goods and services (the productive sector accounts); 6.9% is paid in taxes and 19.6% is saved.

Government

Of government revenues 55.8% comes from indirect taxes (including import duties), 27.5% comes from income taxes, 12.7% comes from taxes on factors and 14.0% comes from SEEs.
Of total government expenditures, 44.9% are made on productive sectors, 41.3% are transfers to households and 14.0% are paid out to SEEs. There is a small amount of net domestic borrowing to finance current consumption (-0.3%). Most government expenditures and savings are recorded in the investment account, with the consequence that the majority of public borrowing is recorded through the capital account.

Rest of the world

Incomes to the rest of the world account comprise almost exclusively of imports of goods and

services. Payments from the rest of the world account are made for exports of goods and services (60.7%); to factors (4.0%), households (4.5%) and in the form of capital transfers (40.6%). Net government transfers abroad account for 11% of overseas transactions.

Capital

Households undertake the majority of saving (68.6%), with the remainder provided largely by overseas investors (31.7%). There is modest net borrowing by the government (less than 1%), since most government borrowing is reflected in the difference between domestic savings and domestic investment, and by negative income from abroad (which corresponds to SEE losses).

5.2. The Disaggregated SAM

The disaggregated SAM is presented in Table A.1 of the appendix. The 55 × 55 matrix provides detailed insight into the structure of the Turkish economy. However, the reader is likely to suffer from visual indigestion if he/she tries to make sense of it in one go. Accordingly, we note the characteristics of the principal sub-matrices of the SAM, namely the 28 × 28 matrix of intermediate demands, the 4 × 28 matrix of sector payments to factors, the 20 × 4 matrix of factor payments to households and the 28 × 20 matrix of household expenditures.

IO Linkages

The 28 × 28 matrix of intermediate demands constitutes the first block (sector payments to sector) of the aggregate SAM. In Table A.1 we show for each sector *j* (reading along the columns) the share of total inputs deriving from each sector *i* (reading down the rows). In Table A.4 we give the same information another way, showing the share of intermediate demand from each sector *i* (reading down the rows) going into each sector *j* (reading along the columns).

For the agricultural and food sectors, these allocations generally conform to expectations. For the four crops sectors, the major input shares are attributable to the crops sectors themselves, together with services, fertiliser, petrol and transport. The livestock sector receives over half its inputs from the crops sectors. The food industry similarly receives the majority of its inputs from the agricultural sectors and the services, fertiliser, petrol and transport sectors. Other food industries are alos important in a number of cases (for example, the soft drinks industry receives 19% of its inputs from the canning sector).

In terms of the allocations of agricultural and food outputs to intermediate demands, the cereals sector supplies over half its output to the livestock sector and 35% to the grain

products industry. The fruit and vegetable sector supplies 40% of its intermediate demand to the canning industry, while other filed crops supplies to textiles, tobacco, sugar, livestock, and oils and fats.

Factors Accounts

The share of gross value added paid to each of the four sectors are 36% to labour in the form of salaries and wages, 12% to capital in the form of capital depreciation and 52% to profit. Of total profit, 27% derives from agricultural activity.

Household Incomes

The distribution of household income, and the shares attributable to each of the four factors, were discussed in Section 2. The 4 × 20 matrix of payments to households reflects this pattern.

Household Expenditures

The most notable feature of the household expenditure matrix is that, as a share of expenditures, the poorest 20% households spend almost twice as much on food as the richest 20%. Rural households spend more of their budgets on food than urban households, while non-agricultural households spend slightly more than agricultural households. Spending on agricultural products as a proportion of expenditure on all 28 sectors is given below for the poorest and richest income groups in each category.

Table 5.4. Spending on Agricultural Products

	Poorest quintile	Richest quintile
Rural agricultural	31%	15%
Urban agricultural	21%	12%
Rural non-agricultural	35%	19%
Urban non-agricultural	22%	10%

Spending on agro-industry products (covering the sector categories from slaughter to leather) is less responsive to income changes, as the following data illustrate:

Table 5.5. Spending on Agro-Industry products

	Poorest quintile	Richest quintile
Rural agricultural	22%	21%
Urban agricultural	14%	14%
Rural non-agricultural	20%	22%
Urban non-agricultural	19%	17%

5.3. Multipliers

The estimation of the multipliers for the IO table and the SAM follows the procedure outlined in Section 4. In general, multipliers, which are computed for the endogenous accounts, show how changes in the expenditure on one account affect the income another account. The IO multipliers, computed for the 28 sector accounts are presented in Table 5.6. These multipliers show how an increase in the final demand for one sector, *j*, raises the input demand for all the sectors which provide an input into *j*. This raises the output of all these sectors and, with it, the associated inputs of these sectors. The IO multipliers show the final results of this circular process. The SAM multipliers capture a broader range of effects. For example, an increase in sectoral output also leads to increased factor payments, which are allocated to households. A proportion of this increase is then spent on the sectors. The magnitude of the SAM multipliers depends on which accounts are taken to be endogenous to the economy. For example, if investment is taken to be endogenous, factor payments to households that are saved re-enter the system in the form of investment. If investment is taken to be exogenous, they do not. The convention is to take one or more of the government, capital and rest of the world accounts as exogenous

Income multipliers measure the induced income effects arising from exogenous shocks to the economy. Such shocks can be imposed from outside (as with a fall in foreign demand for Turkish exports) or can be introduced as deliberate policy changes. The size of the income multipliers allows us to gauge the effects of specific types of policy intervention.

Total income effects

Table 5.6 also shows the income multipliers for the accounts of the aggregate SAM. In each case, the column totals give the total income effect arising from a unit increase in expenditure on that account. Thus, for example, with three exogenous accounts, a 1 billion TL increase in expenditures on productive sectors leads to a 5.62 billion TL increase in total income. Of this increase, 3.08 billion TL accrues to the productive sectors themselves (i.e. is paid to inputs),

1.30 billion TL is paid to factors and 1.25 billion TL is allocated to households. The key point to note from this table is that the total income multiplier is lower for households than it is for productive sectors or factors. This is because a greater proportion of an increase in income "leaks" from the system in the form of higher income tax payments or saving.

The lower multiplier on the household account means that the replacement of sectoral expenditures with direct payments to households would be expected to lead to a net fiscal contraction. Indeed, if we look at the total income multipliers for each account of the disaggregated SAM (Table 5.7), it is clear that the total multipliers on the agricultural accounts (and, to a lesser extent, the food industry accounts) are higher than those on the household accounts. The exception is the relatively high multipliers (around seven) on lower income rural households. The implication is that if sector-specific interventions (such as price supports), which have the effect of increasing total demand, are replaced with an equivalent boost in the form of direct income payments, the net effect would be one of fiscal contraction.

However, the macroeconomic implications of alternative development strategies are beyond the scope of this study. The case for specific forms of intervention rests on many factors other than the size of income multipliers. For example, domestic price intervention, by raising prices to consumers, leads to net welfare losses that this framework cannot capture. Rather, our focus is on the distributional impacts of policy reform, net of any fiscal stimulus or contraction.

5.4. The contrasting income effects of agricultural support policies and direct payments to households

The principal effects of interest are the implications for different categories of household of (a) sector specific policies and (b) direct payments to households. Table 5.7 gives the 20 × 28 matrix of sector to household multipliers, while Table 5.8 gives the 20 × 20 matrix of household to household multipliers. The former shows the impact of an increase in expenditures on each of the 28 sectors on the incomes of each of the 20 types of household, while the latter shows the effect of direct payments to one group of households on all groups.

The first thing to note is that while payments to the agricultural accounts generally provide a bigger boost to total income, direct income payments benefit households more than sector-specific intervention. This is chiefly because the initial benefit is paid in directly, so households receive the initial injection as well as the induced linkage effect. Thus, whereas a TL1 billion direct payment to the poorest rural agricultural households leads to a TL2.5 billion increase in total household income, an equivalent payment to the cereals sector only results in a TL1.8 billion gain.

The second characteristic of sectoral intervention is that urban non-agricultural households actually benefit more than rural agricultural households do. Indeed, Table 5.8 shows that the richest urban agricultural households gain more from all types of agricultural support than any other group of households. This reflects the fact that high income households benefit most from the engagement of the circular flow of income, regardless of the sector to which a demand stimulus is applied.

The third, and related, feature is that the benefits of sectoral support are biased towards the richest households. For example, the richest 20% of agricultural households receive ten times more benefit from agricultural support than the poorest 20%. The same is true for the indirect effects of direct support, but the fact that the recipient household receives the initial injection directly means that the direct effect at least can be targeted. In general, about 40% of the total benefit of a direct payment accrues to the targeted recipient.

Table 5.8 reveals that, in rural areas, the induced benefits to non-agricultural households from higher agricultural incomes are extremely modest. For example, a 1 million TL increase in the expenditures of the average rural agricultural household causes the incomes of all households to rise by an estimated 1.5 million TL over and above the initial payment. Of this increase, 0.33 million TL accrues to rural agricultural households and 0.24 million TL to rural non-agricultural households. This contrasts with a benefit of 0.85 TL million to urban non-agricultural households. Claims that the benefits of agricultural support extend to the broader rural community therefore appear to be overstated.

Table 5.6. Column Total Multipliers for the IO Table and the Dissaggregated SAM

Aggregation / Sectors	Total IO Multiplier	Government, Capital and Rest of the World Exog.	Capital Endogenous
1. Cereal & Pulses	1.28	7.12	10.15
2. Hay & Straw	1.30	7.66	10.87
3. Fruit & Veg	1.28	7.70	11.00
4. Other Field	1.26	6.84	9.72
5. Livestock	1.73	7.43	10.36
6. Forestry	1.20	6.46	9.16
7. Fisheries	1.31	6.97	10.00
8. Mining	1.28	5.54	7.72
9. Slaughter	1.82	5.69	7.70
10. Canning	1.97	7.66	10.61
11. Oils & Fats	1.85	5.56	7.50
12. Grain Prods	1.95	7.13	9.82
13. Sugar	1.80	7.17	9.84
14. Other Food	2.23	7.24	9.84
15. Alcohol	1.59	6.35	8.86
16. Soft Drinks	2.16	7.07	9.60
17. Tobacco	1.71	6.43	8.89
18. Textiles	2.08	6.87	9.37
19. Leather	2.38	7.26	9.83
20. Wood	1.79	5.06	6.77
21. Fertiliser	1.91	4.53	5.88
22. Ag Machine	1.66	4.06	5.32
23. Petroleum Refineries	1.43	2.37	2.88
24. Industry	1.75	4.99	6.65
25. Crude Petroleum	1.03	1.77	2.17
26. Power	1.43	6.89	9.72
27. Transport	1.49	6.14	8.60
28. Services	1.33	7.24	10.28
Labour		6.95	10.30
Capital		6.46	9.66
Agricultural Profit		7.06	10.72
Non-Agricultural Profit		6.11	9.55
Rural Agricultural 0-20%		7.20	10.05
Rural Agricultural 21-40%		7.09	9.95
Rural Agricultural 41-60%		6.74	9.96
Rural Agricultural 61-80%		6.33	9.87
Rural Agricultural 81-100%		5.69	9.75
Urban Agricultural 0-20%		6.24	9.59
Urban Agricultural 21-40%		6.17	9.55
Urban Agricultural 41-60%		6.18	9.45
Urban Agricultural 61-80%		6.05	9.42
Urban Agricultural 81-100%		4.89	9.28
Rural Non-Agricultural 0-20%		7.19	9.73
Rural Non-Agricultural 21-40%		6.95	9.42
Rural Non-Agricultural 41-60%		6.68	9.52
Rural Non-Agricultural 61-80%		6.27	9.41
Rural Non-Agricultural 81-100%		5.68	9.25
Urban Non-Agricultural 0-20%		6.28	9.49
Urban Non-Agricultural 21-40%		6.23	9.42
Urban Non-Agricultural 41-60%		6.30	9.40
Urban Non-Agricultural 61-80%		6.13	9.18
Urban Non-Agricultural 81-100%		5.06	9.04
Capital			8.29
Rest of the World			

Table 5.7. 20x28 Matrix of Household Multipliers x1000

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
RuralAg 1st	36	29	37	34	31	28	12	10	15	24	11	23	20	19	14	15	18	12	13	9	6	5	2	7	1	13	10	14
RuralAg 2nd	67	53	69	63	58	52	20	17	27	43	18	42	36	33	24	25	32	21	23	16	10	9	3	12	2	21	17	23
RuralAg 3rd	107	84	110	101	92	83	29	24	42	67	28	65	54	52	36	38	50	31	34	24	15	13	5	18	4	30	24	33
RuralAg 4th	163	127	168	153	140	126	43	35	64	102	41	99	82	78	54	57	76	47	51	36	22	19	7	26	5	44	36	49
Rural Ag 5th	380	288	390	358	325	292	92	71	144	231	90	227	180	176	119	123	171	100	110	78	44	39	15	54	12	90	75	101
UrbanAg 1st	3	3	3	3	3	2	2	2	2	2	1	2	2	2	2	2	2	2	2	1	1	1	0	1	0	2	2	2
UrbanAg 2nd	6	5	6	6	5	5	3	3	3	5	2	4	4	4	3	3	3	3	3	2	2	1	0	2	0	3	3	3
UrbanAg 3rd	9	8	10	9	8	7	4	3	4	7	3	6	6	5	4	5	5	4	4	3	2	2	1	3	0	4	3	5
UrbanAg 4th	15	13	16	14	13	12	6	5	7	11	5	10	9	8	7	7	8	6	6	4	3	3	1	4	1	7	5	7
UrbanAg 5th	48	39	50	45	42	38	22	16	22	34	17	32	27	27	22	22	26	20	21	15	10	9	4	12	3	21	18	22
RuralNonAg 1st	12	16	14	11	13	12	16	14	10	15	11	13	16	13	13	15	12	14	14	9	9	7	3	10	2	17	14	18
RuralNonAg 2nd	24	34	28	23	25	24	30	25	19	28	20	25	32	26	25	28	24	27	26	18	15	14	5	19	4	32	25	35
RuralNonAg 3rd	37	51	44	36	39	37	44	38	29	43	30	38	47	39	37	41	36	39	39	27	23	20	7	28	6	46	37	52
RuralNonAg 4th	58	75	67	56	60	56	68	54	44	64	44	57	67	58	56	60	54	58	59	39	32	30	11	41	9	67	56	75
RuralNonAg 5th	134	154	149	128	134	125	169	117	101	145	103	131	133	131	133	132	125	134	137	90	71	68	28	90	22	152	135	164
UrbanNonAg 1st	36	57	44	35	40	39	54	47	33	48	36	42	57	45	44	50	40	48	47	32	29	25	9	35	7	59	46	64
UrbanNonAg 2nd	62	97	75	60	69	66	92	81	57	82	62	72	96	77	76	86	69	82	81	55	50	43	15	60	12	101	79	110
UrbanNonAg 3rd	94	144	113	92	104	100	141	120	87	124	93	108	141	115	116	128	105	124	123	83	74	65	24	89	18	150	120	164
UrbanNonAg 4th	144	218	172	140	159	152	222	182	133	189	142	166	212	177	178	194	161	190	189	127	110	100	37	136	29	227	185	249
UrbanNonAg 5th	385	491	437	370	412	382	710	472	367	516	406	456	457	481	530	508	459	540	550	358	292	280	120	366	95	625	569	660
Total	1820	1986	2002	1737	1772	1638	1779	1336	1210	1780	1163	1618	1678	1566	1493	1539	1476	1502	1532	1026	820	753	297	1013	232	1711	1459	1850

1. Cereals and Pulses
2. Hay and Straw
3. Fruits and Vegetables
4. Other Field Crops
5. Livestock
6. Forestry
7. Fisheries
8. Mining
9. Slaughter
10. Canning
11. Oils & Fats
12. Grain Prods
13. Sugar
14. Other Food
15. Alcohol
16. Soft Drinks
17. Tobacco
18. Textiles
19. Leather
20. Wood
21. Fertiliser
22. Ag Machine
23. Petroleum Refineries
24. Industry
25. Crude Petroleum
26. Power
27. Transport
28. Services

Table 5.8. 20x20 Matrix of Household to Household Multipliers x1000

	RuralAg 1st	RuralAg 2nd	RuralAg 3rd	RuralAg 4th	Rural Ag 5th	UrbanAg 1st	UrbanAg 2nd	UrbanAg 3rd	UrbanAg 4th	UrbanAg 5th	RuralNonAg 1st	RuralNonAg 2nd	RuralNonAg 3rd	RuralNonAg 4th	Rural NonAg 5th	UrbanNonAg 1st	UrbanNonAg 2nd	UrbanNonAg 3rd	UrbanNonAg 4th	UrbanNonAg 5th
RuralAg 1st	1017	17	16	14	11	13	13	13	12	9	18	16	15	13	11	13	13	12	11	9
RuralAg 2nd	31	1030	28	25	19	23	24	22	21	15	33	28	27	24	20	24	22	22	19	15
RuralAg 3rd	48	46	1043	38	29	35	36	34	32	23	51	43	41	36	31	36	34	33	29	22
RuralAg 4th	73	70	65	1057	43	52	54	51	48	34	77	65	62	55	46	54	51	49	44	33
Rural Ag 5th	163	156	145	126	1095	116	121	112	105	74	173	145	139	122	102	120	114	107	96	72
UrbanAg 1st	2	2	2	2	1	1002	2	2	1	1	2	2	2	2	1	2	2	2	1	1
UrbanAg 2nd	3	3	3	3	2	3	1003	3	3	2	4	3	3	3	2	3	3	3	2	2
UrbanAg 3rd	5	5	5	4	3	4	4	1004	4	3	5	5	4	4	3	4	4	4	3	3
UrbanAg 4th	8	8	7	6	5	6	6	6	1006	4	8	7	7	6	5	6	6	6	5	4
UrbanAg 5th	26	25	23	21	17	20	20	19	18	1013	26	23	22	20	17	20	19	19	18	13
RuralNonAg 1st	13	12	12	11	10	11	11	11	11	8	1012	12	12	11	10	11	11	11	11	9
RuralNonAg 2nd	24	24	23	21	19	21	21	21	20	16	24	1024	23	21	19	21	21	22	21	17
RuralNonAg 3rd	37	36	34	32	29	32	31	31	30	24	36	35	1034	31	28	32	32	32	31	26
RuralNonAg 4th	55	53	51	47	42	47	46	46	45	35	54	52	50	1047	42	47	47	48	46	38
RuralNonAg 5th	124	121	114	107	95	108	104	105	102	79	123	119	114	106	1095	108	107	109	106	85
UrbanNonAg 1st	42	42	39	37	34	38	36	37	36	29	42	41	40	37	33	1038	38	39	38	31
UrbanNonAg 2nd	73	71	68	64	59	65	62	63	62	49	72	71	68	63	57	65	1065	66	65	53
UrbanNonAg 3rd	109	107	102	96	88	97	93	95	93	73	108	106	102	95	86	97	97	1100	97	80
UrbanNonAg 4th	167	164	155	147	135	149	143	145	142	112	164	162	156	146	132	149	148	153	1149	122
UrbanNonAg 5th	456	449	425	403	367	415	394	402	393	306	448	443	428	401	362	410	409	423	418	1333
Total	2476	2441	2360	2261	2103	2257	2224	2222	2184	1909	2480	2402	2349	2243	2102	2260	2243	2260	2210	1968

5.6. Summary

In this section we presented the 1995 SAM and its associated income multipliers. The most striking result of the exercise in data collection is that, whilst there is evidence to suggest that rural incomes are generally lower than urban incomes, there is no evidence that farm households are typically poorer than non-farm households in either rural or urban areas. The multipliers associated with the SAM further suggest that there are few linkages from agricultural to other rural households. This implies that, in terms of raising incomes in rural areas, agricultural policies work inequitably. The results of the simulations also suggest that agricultural households would benefit more if they were to receive a given level of support in the form of a direct payment, rather than through current policy provisions. In short, agricultural households are served poorly by output-related policy measures, while other rural households, to the extent that they would be eligible for payments, are served even worse.

6. SUMMARY AND CONCLUSIONS

The Social Accounting Matrix developed in this study was disaggregated in such a way as to detail the agricultural aspects of the economy and the linkages from agriculture to the rest of the economy. The main purpose of this disaggregation was to shed light on the implications of agricultural policy reform for household incomes in Turkey.

Accordingly, the main findings of the study relate to the effects on agricultural and other households of a switch from the current system of agricultural support to a system of direct income payments to agricultural households. At the same time, the SAM is a useful policy tool that can be used to address a broader range of policy issues. In this section we review the key results arising from development of the SAM and discuss the other attributes of the SAM that may yield policy insights. We then draw some policy conclusions and present an agenda for future work.

6.1. Main Findings: The Distribution of Policy Benefits

Only a small proportion of the benefits of current agricultural policy benefits low-income households.

Under the current system of price supports and input subsidies, the extent of support is tied to the volume of output, so it is not surprising that the distribution of support tends to favour high-income farmers. However, we show that the macroeconomic linkages in the economy are such that a considerable proportion of the overall benefits "leak" to non-agricultural households, since these households produce both the intermediate goods demanded by the agricultural sector and the final products demanded by agricultural households. Of course, these gains need to be balanced against the income losses caused by higher food prices.

Agricultural support provides a smaller overall boost to incomes than support for other sectors.

The broader aspects of economic development are beyond the scope of this study. Nevertheless, the income multipliers for the agricultural sectors are generally lower

than those for other sectors, including the food industry and other manufacturing and service sectors.

There are few linkages from agricultural households to rural non-agricultural households.

This finding is important in view of the stated commitment to support rural – not just agricultural – incomes. There is no evidence to suggest that, in rural areas, agricultural households are any worse off than non-agricultural households. Sector-specific support thus advantages one group and not another when there is neither an explicit obligation to do so, nor any reason on grounds of equity.

Direct income payments can be tailored to provide the desired distributional effect.

Households gain more from direct support because they benefit from the initial injection as well as from linkage effects. Moreover, support to the poorest agricultural households leads to an increase in aggregate household income that is 50% higher than that achieved by an equivalent amount of support to the cereals sector.

The cost of policy intervention can be reduced to the extent that payments to higher income farmers are limited.

The richest 20% of agricultural households receive nearly ten times more income than the poorest 20%. The broad correspondence between farm income and farm size implies that the cost of using price supports to establish a minimum level of income is several times higher than the cost of a limited direct payment scheme would be.

6.2. Other Attributes of the SAM

The SAM is a useful data source.

Construction of a SAM requires a large exercise in data assembly. The data compiled can be analysed independently and may form the basis for further economic analysis. The three main data sources used to construct the 1995 SAM were the 1994 Income Distribution Survey, the 1994 Household Expenditure Survey and the 1990 Input-

Output Table. Potentially important uses of these data are discussed in Section 6.4.

The problem of low incomes is a rural issue rather than a specifically agricultural one.

However, even without formal analysis, inspection of the data can be informative. An important policy implication derives simply from inspection of the data on household incomes. These data (which are incorporated into the SAM) show that, in rural areas, the incomes of agricultural and non-agricultural households are very similar, not just on average, but also in terms of their distribution. The same is true in urban areas. These similarities are evident despite basic differences in the sources from which agricultural and non-agricultural households derive their income. The key distinction is between rural and urban households, with urban households likely to earn more than rural households, irrespective of whether they derive their income from agriculture or not.

Given that official policy statements attest to the need to maintain rural incomes in general, it is questionable whether specifically agricultural policies are the best way of achieving this objective. The inefficacy of current measures is further underlined by the low degree of linkage between the incomes of agricultural and non-agricultural households.

6.3. Policy Implications

Compensatory payments can be designed to mitigate the effects of agricultural policy reform on the incomes of farm households.

A major concern about the removal of price supports and other output-related measures is that, whilst aggregate incomes may improve, many agricultural households will suffer a sharp drop in their incomes and there will be attendant social problems (such as accelerated rural-urban migration). Our study suggests that such effects can be forestalled by the design of an appropriate method of compensation.

However, compensation may be a short-run necessity rather than an appropriate long-term objective.

In the long-term, the objectives of policy need to be reformulated in terms that are consistent with legitimate economic and social objectives and sufficiently clearly articulated that the performance of policy can be measured and compared with possible alternatives. In particular, the objective of income support needs to specify the criteria under which households would qualify for support. Given that, in rural areas, the incomes of non-agricultural households are generally no higher than those of agricultural households, it may not make sense for such criteria to be tied to agricultural production at all.

The objectives of income support should be defined in such a way that the criteria governing eligibility for support are made clear.

As they stand, the stated objectives of Turkish agricultural policy cannot form the basis for an appropriate analysis of policy performance. Some of the goals are of questionable merit (e.g. increasing production and increasing self-sufficiency), while others are too imprecisely articulated to be practically useful (e.g. maintaining the health of rural communities). The social objective of maintaining agricultural or rural incomes should be stated sufficiently precisely that the households that the government wishes to see benefit from income support are made clear.

Current policies tend to favour higher income farmers. If these farmers are to be compensated for income losses following price reform, then the time period over which compensation is to be provided should be spelt out. Insofar as compensatory payments represent a transition to a more targeted system of direct payments, the profile of transition should be described, so that actual policy can be compared with official policy commitments.

A pre-requisite for a direct income payment scheme is a registry of households.

If a system of direct income payments is to be introduced, its viability will depend largely on the functioning of a household registry. If the goal of policy is to compensate farm households for the removal of price supports, input subsidies and other subsidies, then payments based on historic farm size are one way of ensuring that the distribution of the benefits from change corresponds broadly to the pattern of losses. In the long term, however, payments based on the level of household income

can be targeted to low-income households. Unfortunately, it is more difficult to build a registry under which selected agricultural (and perhaps non-agricultural) households provide full reports of their incomes, than it is to establish one based on farm size.

Neither the SAM, nor the income distribution survey around which it is partially constructed, provide enough information on which to base a system of direct payments. However, they do provide information on the structure of the agricultural and rural economy, and this may inform decisions regarding the criteria under which households would qualify for income support.

6.4. Implications for Future Work

A Computable General Equilibrium (CGE) model would overcome some of the limitations of the SAM framework.

The fixed-price SAM framework is not especially well-equipped to examine the effects of price reform. Nevertheless, it gives an indication of the reallocations that are induced by large-scale sectoral intervention. The SAM is better placed to analyse the effects of a system of direct income payments since these leave the relative prices of commodities unchanged.

The most significant limitation of the SAM is its assumption that the economy is purely demand driven and there are no relative price effects. A CGE model can overcome this limitation. The SAM provides the basic database for a CGE model and the current framework could be adapted to consider the shift in resources from agricultural to non-agricultural activities when agricultural prices are reduced.

Household level models could provide insights into how different types of agricultural household are likely to adjust to policy change.

The accumulation of survey information on the behaviour of agricultural households may also be used to consider how agricultural households adapt in the face of structural change and policy change. As agricultural prices fall, either as a result of policy reform or fundamental pressures under which the growth of supply tends to outpace increases in demand, some agricultural households and enterprises are likely to remain profitable, while others are not. Farm households which are not competitive

are likely to respond either by diversifying their sources of income, or by exiting the sector altogether. Household level analysis can provide important insights into the likely path of adjustment. The 1994 Income Distribution Survey provides disaggregated information on the sources of household incomes and could be used to model how agricultural households would be likely to respond to changes in the prices of agricultural crops or other factors which alter the returns to agriculture vis-à-vis other sectors.

The 1990 Input-Output Survey also contains valuable household level data. A large number of agricultural households are both producers and consumers of their output. Policy change is bound to affect these households differently to commercial farms that market their entire output.

Further work should focus on the politics, as well as the economics, of policy reform. Clearer policy statements, to which policy-makers could be held accountable, would increase the likelihood of legitimate economic and social objectives dominating political exigencies.

Political economy analysis suggests that implicit political objectives often dominate explicitly stated goals. However, policy-makers are often able to defend existing policies by appealing to the consistency between policy and stated objectives. The vagueness with which policy goals are articulated makes such obfuscation possible. If the goals of policy can be reformulated in ways that make the performance of alternative policies measurable and comparable, then this increases the likelihood that the policy process can be tied to legitimate criteria rather than political expedience.

In the main body of the report, attention was drawn to the inability of official policy statements to provide a meaningful guide to policy design. In terms of income redistribution, a clear statement of who is intended to benefit, and by how much, would be extremely valuable. At present, it is not clear whether policy is intended to benefit agricultural households, rural households or both, or when a household is considered to have enough income that other households should no longer have to subsidise it. In our study, we experimented with various direct income payment schemes, and report the results of alternative methods of compensation and targeting. However, the modelling framework could be used more profitably analysing policies

centred on actual policy goals rather than hypothetical ones. The danger is that the proposals considered may be considered "politically impracticable" partly because policy goals are formulated in a manner that helps preserve the status quo.

REFERENCES

Adelman, Irma, Edward Taylor and Steve Vogel. 1988. "Life in a Mexican Village: A SAM Perspective." *Journal of Development Studies*, 25:5-24.

Adelman, Irma, and Edward Taylor. 1990. "Is Structural Adjustment with a Human Face Possible? The Case of Mexico." *Journal of Development Studies*, 27:387-59.

Adelman, Irma, A Erinc Yeldan and D.W. Roland-Holst. 1989. "Optimal Adjustment to Trade Shocks under Alternative Development Strategies." *Journal of Policy Modeling*, 11, 1, 451-505.

Becker, Gary. 1983. "A Theory of Competition among Pressure Groups for Political Influence", *Quarterly Journal of Economics*, XCVIII (3), 371-400.

Browning, E.K. 1987. "On the Marginal Welfare Cost of Taxation*" American Economic Review*, Vol. 77, pp. 11-23.

Central Bank of the Republic of Turkey. Balance of Payments Statistics of Turkey 1995, Ankara, 1996.

Fullerton, D. 1991. "Reconciling Recent Estimates of the Marginal Welfare Cost of Taxation", *American Economic Review*, Vol. 81, pp. 302-308.

Grethe, Harald. 1997. "Implications of Turkey's Commitments under the WTO and Possibe Impacts of Eventual Extension of the Customs Union with the EU to Cover Agricultural Products", Final Report, Turkish Ministry of Agriculture and Rural Affairs and Food and Agriculture Organisation of the United Nation.

Gunluk-Senesen, G. 1991. "A Social Accounting Matrix for Turkey." *Tuplum ve Ekonomi*, 13,1, 17-42.

Kasnakoğlu, H. and E. Çakmak. 1998. "The Fiscal Burden and Distribution of Costs and Benefits of Agricultural Support Policies in Turkey", Working Paper, Middle East Technical University, Ankara.

Haggblade, Steven, Peter Hazell and J. Brown. 1989. "Farm-Nonfarm Linkages in Rural Sub-Saharan Africa." *World Development*, 17:1173-1201.

Harrison, G.W., T.F. Rutherford and D.G. Tarr. 1993. "Trade Reform in the Partially Liberalized Economy of Turkey." *The World Bank Economic Review*, 7, 2, 192-217.

OECD. 1994. *Assessing the Relative Transfer Efficiency of Agricultural Support Policies*, OCDE/GD(94)4, Paris.

OECD. 1994. *National Policies and Agricultural Trade -- Country Study: Turkey*. Paris: OECD Publications

OECD. 1997. *Agricultural Policies in OECD Countries: Monitoring and Evaluation*, OECD, Paris.

Ozhan, H. Gazi. 1988. "A Planning Model for Turkey within a Social Accounting Framework." *Yapi Kredi Economic Review*, 11, 2/3, 25-52.

Ozhan, H. Gazi, and Robert A. DeSantis. 1995. "A Social Accounting Marix for Turkey 1990." Inforum Working Papers, Interindustry Forecasting Project, Department of Economics, University of Maryland, College Park, Maryland, United States.

Parikh, Alkha, and Erik Thorbecke. 1996. "Impact of Rural Industrialization on Village Life and Economy: A Social Accounting Matrix Approach. 351-378.

Peltzman, Sam. 1976. "Toward a General Theory of Regulation", Journal of Law and Economics, 19 (2), 211-240.

Peltzman, Sam. 1989. "The Economic Theory of Regulation after a Decade of Deregulation", *Brookings Papers on Economic Activity*, Brookings Institution, Washington DC.

Prime Ministry Undersecretaries of Treasury and Foreign Trade. Main Economic Indicators 1995, Ankara, 1996.

Pyatt, Graham, and Jeffrey Round. 1989. "Accounting and Fixed Price Multipliers in a Social Accounting Framework." *Economic Journal*, 89, 850-73.

Sadoulet, Elisabeth and Alain de Janvry. 1995. *Quantitative Development Policy Analysis*, Johns Hopkins University Press, Baltimore and London.

State Institute of Statistics. The Input-Output Structure of the Turkish Economy 1990. Ankara, 1994.

State Institute of Statistics. Income Distribution 1994. Household Income and Expenditure Survey Results, Ankara, 1997.

State Institute of Statistics. Consumption Expenditures 1994. Household Income and Expenditure Survey Results, Ankara, 1997.

State Planning Organisation, Main Economic Indicators December 1996, Ankara, 1997.

Stigler, George. 1971. "The Economic Theory of Regulation", *Bell Journal of Economics and Management Science*, 2 (1), 3-21.

Subramanian, Shankar, and Elisabeth Sadoulet. 1990. "The Transmission of Production Fluctuations and Technical Change in a Village Economy." *Economic Development and Cultural Change*, 39, 131-73.

UN-FAO (1997), "Assistance for Agricultural Policy Reform in Turkey: Relating to GATT and EU Agreements", Draft Report for Project TCP/TUR/4452, May 1997.

Winters, L.A. 1990. "The So-Called Non-Economic Objectives of Agricultural Support", OECD Economic Studies, 13, Paris, OECD.

World Bank. 1997. Agricultural Support Policy Mission. Aide-Memoire.

Yeldan, A. Erinc. (1989). "Structural Adjustment and Trade in Turkey: Investigating the Alternatives Beyond Export-Led Growth." *Journal of Policy Modeling*, 11, 2, 273-296.

APPENDIX A.1. DISAGGREGATED SAM

		Productive Sectors																											
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	Cereals	4 278	1 554	-	-	78 205	0	129	-	102	-	-	48 616	-	1 866	884	-	-	-	-	45	-	-	-	44	-	-	50	2 449
2	Hay & straw	-	-	-	-	75 995	0	-	-	99	-	-	-	-	-	-	-	-	-	-	43	-	-	-	43	-	-	49	2 379
3	Fruit & veg	-	-	17 890	-	-	1	-	-	-	29 824	-	-	-	9 193	4 357	1 631	-	-	-	-	-	-	-	219	-	-	248	12 066
4	Other field	-	-	-	6 177	-	0	-	-	139	8 263	11 887	-	43 107	2 547	-	-	34 434	47 361	-	61	-	-	-	61	-	-	69	3 343
5	Livestock	3 363	1 221	-	3 342	48 439	3	-	-	39 273	-	18	51	-	12 893	-	-	-	2 081	20 498	-	-	-	-	0	-	-	136	34 111
6	Forestry	89	32	111	89	-	65	0	882	1	-	1	20	-	460	0	0	2	81	101	27 888	-	4	-	7 854	-	119	1 354	3 189
7	Fisheries	-	-	-	-	-	-	40	-	-	-	-	-	-	332	-	-	-	-	-	-	-	-	-	1	-	-	53	4 479
8	Mining	9	3	11	9	91	28	18	170	19	46	201	35	2 912	228	6	9	15	121	86	186	1 609	30	-	51 868	-	9 870	4 131	1 718
9	Slaughter	-	-	-	-	-	-	87	-	3 489	97	130	-	6	6	-	-	-	2 320	22 896	8	-	-	-	1 096	-	-	508	2 811
10	Canning	-	-	-	-	-	-	224	-	0	364	201	106	-	128	159	5 775	-	-	-	-	38	-	-	20	-	-	144	1 629
11	Oils & fats	-	-	-	-	5 919	-	126	-	457	260	36 004	465	2	4 124	3	6	-	15	-	-	-	-	-	3 666	-	-	107	7 186
12	Grain prods	-	-	-	-	5 309	-	359	40	12	130	275	581	-	33 282	296	4	-	37	-	8	-	-	-	15	-	34	276	8 716
13	Sugar	-	-	-	-	3 078	-	170	-	9	598	33	18	6	5 114	918	6 246	-	-	-	-	-	-	-	289	-	-	142	18 437
14	Other food	-	-	-	-	19 992	0	342	13	663	137	182	9	-	4 601	138	2	-	5	6	79	-	-	-	406	-	13	2 156	6 713
15	Alcohol	-	-	-	-	-	0	24	-	-	-	-	-	-	39	1 325	-	-	-	-	-	-	-	-	-	-	-	127	7 974
16	Soft drinks	-	-	-	-	-	1	104	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6 312	8 318
17	Tobacco	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97	1 075
18	Textiles	511	-	-	508	-	23	315	59	98	97	4 864	1 615	499	201	25	41	467	254 450	8 113	869	361	10	27	5 028	-	158	4 574	2 810
19	Leather	-	-	-	-	-	-	-	56	1	4	-	1	-	3	0	-	0	34 000	99 152	118	4	4	-	345	-	197	12	43
20	Wood	123	45	153	122	464	35	159	25	60	991	266	88	341	1 273	161	859	4 333	722	1 270	58 889	18	17	9	79 616	74	705	1 589	25 837
21	Fertiliser	19 022	6 908	23 648	18 902	-	77	-	-	-	1	-	-	-	0	-	-	-	-	1	2	19 515	-	-	119	-	-	-	-
22	Ag. Machine	958	348	1 192	952	-	33	-	-	-	-	-	-	-	-	-	-	-	-	-	2	57	11 135	-	124	-	-	-	-
23	Petrol ref's	4 321	1 569	5 372	4 294	733	354	4 766	4 749	719	1 406	877	259	3 166	2 167	598	521	157	4 431	1 422	3 143	1 122	133	1 037	112 020	483	5 416	206 573	28 182
24	Industry	2 350	853	2 921	2 335	5 206	378	1 210	5 814	618	4 418	3 179	210	2 478	3 894	3 121	6 768	3 763	13 092	24 366	12 087	14 823	5 553	502	1 140 006	1 019	14 304	127 832	113 569
25	Crude petrol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 535	-	168 417	759	-	14 991	245	-
26	Power	483	175	601	480	1 144	47	21	4 022	655	700	1 510	5 786	4 162	1 445	566	931	401	23 854	2 334	12 055	3 109	200	3 037	80 975	166	17 441	4 896	33 353
27	Transport	3 628	1 318	4 511	3 606	23 338	3 470	806	1 668	5 103	3 524	4 779	5 914	9 720	5 213	1 141	1 910	3 077	29 596	11 805	15 455	4 599	888	6 568	188 771	1 729	10 442	73 138	147 779
28	Services	8 250	2 996	10 256	8 198	28 347	2 887	2 279	5 254	6 668	5 229	11 995	6 015	9 338	7 781	2 164	6 013	3 904	143 373	30 366	17 678	4 268	1 922	6 385	299 762	886	10 776	129 519	343 042

		Factors				Households																				Gov't	ROW	Capital	Total
		29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	
1	Cereals					2 119	3 410	4 372	5 023	6 222	307	548	623	753	1 054	5 199	6 498	8 318	9 792	16 069	5 939	8 178	9 492	10 533	17 135	950	13 981	8 875	283 614
2	Hay & straw					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15 637	94 247
3	Fruit & veg					3 972	6 876	9 157	10 920	13 527	288	552	653	819	1 145	4 872	6 552	8 711	10 643	17 469	11 131	16 489	19 882	22 897	37 254	1 592	68 668	21 932	371 430
4	Other field					2 019	3 248	4 164	4 785	5 926	293	522	594	717	1 004	4 953	6 190	7 923	9 327	15 306	5 657	7 789	9 041	10 033	16 321	905	18 936	12 463	305 561
5	Livestock					9 650	15 895	21 137	23 666	26 651	700	1 277	1 507	1 774	2 257	11 838	15 146	20 108	23 066	34 415	27 043	38 120	45 893	49 626	73 394	1 352	6 876	-14 436	602 385
6	Forestry					1	11	29	84	1 402	17	101	296	477	1 860	2	23	41	143	1 759	127	400	1 246	1 694	4 501	2 336	250	-4 316	54 829
7	Fisheries					603	1 222	2 127	2 722	4 013	44	98	152	204	340	739	1 164	2 024	2 653	5 182	1 688	2 930	4 619	5 708	11 050	3	1 091	-218	55 065
8	Mining					160	277	366	461	653	18	38	51	71	154	204	403	454	643	1 304	700	1 123	1 542	1 997	5 020	3 493	19 886	9 315	121 758
9	Slaughter					879	1 644	2 500	3 200	5 369	64	132	178	240	455	1 078	1 566	2 378	3 119	6 934	2 464	3 943	5 428	6 709	14 787	17 284	2 545	1 564	117 915
10	Canning					463	793	1 050	1 214	1 513	34	64	75	91	128	568	755	999	1 184	1 954	1 299	1 901	2 280	2 547	4 168	9 457	28 925	8 576	78 826
11	Oils & fats					1 782	2 865	3 551	4 231	4 769	129	230	253	317	404	2 186	2 730	3 378	4 124	6 158	4 993	6 870	7 710	8 873	13 132	1 357	16 540	-6 086	148 835
12	Grain prods					1 083	1 742	2 234	2 567	3 179	79	140	159	192	269	1 328	1 660	2 125	2 502	4 106	3 035	4 179	4 850	5 382	8 755	764	5 494	-6 623	98 576
13	Sugar					1 657	2 696	3 372	4 120	4 286	120	217	240	309	363	2 032	2 569	3 208	4 015	5 534	4 642	6 465	7 322	8 638	11 803	1 305	115	17 593	127 679
14	Other food					919	1 572	2 083	2 409	3 002	67	126	149	181	254	1 128	1 498	1 981	2 348	3 877	2 576	3 771	4 522	5 051	8 267	1 148	50 967	1 755	135 110
15	Alcohol					109	564	636	1 309	3 432	8	45	45	98	291	134	538	605	1 276	4 432	306	1 354	1 381	2 745	9 453	7	1 700	405	40 362
16	Soft drinks					141	438	751	1 249	2 527	10	35	54	94	214	173	418	714	1 218	3 263	395	1 051	1 630	2 619	6 959	239	1 417	3 899	44 244
17	Tobacco					1 329	2 836	3 622	4 798	6 433	96	228	258	360	545	1 630	2 702	3 446	4 676	8 307	3 724	6 802	7 865	10 061	17 716	0	7 201	1 789	97 596
18	Textiles					2 882	5 524	9 336	14 457	30 156	326	831	1 206	1 909	4 093	3 837	7 106	11 031	18 397	41 996	12 613	24 803	36 710	53 400	133 136	11 870	156 056	40 024	907 424
19	Leather					1 321	2 349	3 926	5 128	7 446	143	337	475	682	975	1 754	2 914	4 577	6 298	10 540	5 547	10 065	14 464	19 080	31 707	13 415	9 194	32 777	319 056
20	Wood					10	71	192	564	9 403	114	676	1 985	3 198	12 474	14	152	277	960	11 794	851	2 685	8 356	11 361	30 177	2 298	11 294	6 206	293 355
21	Fertiliser					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 626	5 331	95 152
22	Ag. Machine					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2 416	32 315	49 533
23	Petrol ref's					992	1 872	2 381	2 930	3 086	113	254	329	454	730	1 268	2 726	2 947	4 089	6 164	4 350	7 598	10 019	12 697	23 733	19 980	14 107	-53 985	468 826
24	Industry					5 210	12 575	16 792	23 332	68 176	519	1 392	1 967	3 200	7 400	7 570	25 734	23 620	37 788	66 639	20 062	41 574	59 855	92 367	240 693	30 857	225 133	1 710 117	4 239 238
25	Crude petrol					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	13 158	199 160
26	Power					619	1 029	1 414	1 714	2 014	70	140	195	266	476	791	1 498	1 750	2 393	4 022	2 715	4 176	5 948	7 429	15 486	17 347	56	-	276 097
27	Transport					9 049	15 337	19 786	32 061	26 506	2 448	2 376	4 196	4 949	3 181	10 684	18 025	29 290	36 827	65 911	49 125	73 721	124 130	235 956	195 112	35 150	60 622	98 550	1 726 486
28	Services					10 984	17 754	25 114	35 359	109 837	1 703	2 602	3 848	5 846	18 724	13 827	25 637	33 840	48 037	105 565	53 562	89 847	139 994	178 477	603 105	664 134	275 971	158 722	3 738 042