WP/00/98

IMF Working Paper

Turkmenistan—The Burden of Current Agricultural Policies

Gonzalo Pastor and Ron van Rooden

INTERNATIONAL MONETARY FUND

 WP/00/98

IMF Working Paper

European II Department

Turkmenistan—The Burden of Current Agricultural Policies

Prepared by Gonzalo Pastor and Ron van Rooden[1]

Authorized for distribution by Oleh Havrylyshyn

June 2000

Abstract

This paper analyses the economic costs of current agricultural policies in Turkmenistan. It argues that the opportunity cost of continuing with these policies is very high for the budget, the average farmer, and the economy as a whole. The paper calls for the development of nontraditional agricultural crops, which are more profitable than wheat and cotton in the international commodity markets, and a comprehensive and sustained reform strategy for the agricultural sector.

JEL Classification Numbers: O11, O13, O21, Q1

Keywords: agricultural policies, transition economies, cost of protection

Author's E-Mail Address: gpastor@imf.org, rvanrooden@imf.org

---

[1] The authors would like to thank Oleh Havrylyshyn, Tom Wolf, Jon Craig, Julie Kozack, Tony Cholst, Andriy Storozhuk, and the members of the European II department Structural Reform Group, especially Bob Christiansen, for their comments on earlier drafts of this paper. Special thanks are also due to Sepideh Khazai for her research assistance.

Contents Page

I. INTRODUCTION

During the last 6–7 years, Turkmenistan has been engaged in a two-track economic development strategy. On the one hand, the country has borrowed extensively from western economies to finance the upgrading and development of the energy sector. On the other hand, agriculture has also benefited heavily from foreign lending, as new silos, imports of machinery and equipment, and upgrading of the agroindustrial base have been financed by foreign savings. While this development strategy has yielded an increased supply of oil and gas, and rapid growth in cotton and wheat production, it has also translated into growing fiscal deficits, a rapidly deteriorating external current account deficit, and a sharp rise in actual and projected debt service ratios, which are worrisome by international standards. Moreover, economic incentives for sustained agricultural growth have been missing from the government's development strategy, as output growth has been attained through heavy state intervention in the production and marketing of agricultural products.

Looking to the future, the question for policymakers is how to bring about sustained economic growth in an environment in which economic resource allocation is optimized and exports of goods and services are sufficient to pay for the internal and external resource cost of the current development strategy. While energy sector developments will be particularly dependent on the—still uncertain—construction of the Trans-Caspian gas pipeline, agricultural sector developments and policies are more within the authorities' control and may even represent a more immediate concern for the government. First, the stock of external debt of the agricultural sector is as large as that of the energy sector (about US$0.8 billion by end-1999, equivalent to 22 percent of GDP). Also, growth in agriculture is a highly desirable political objective as nearly 50 percent of the population depend on this sector and live in very poor conditions. In addition, according to the government's socioeconomic program through 2010, total agricultural production—under the lead of rapid output growth of cotton, wheat, and other grains—is targeted to double with respect to 2000 levels (Table 1).[2] Agroindustry, including textiles and food industry production, is also targeted to grow very rapidly during the next decade according to the national program.

This paper analyses the economic costs of current agricultural policies in Turkmenistan. Section II starts with a brief description of Turkmenistan's external competitiveness problem, which affects not only the agricultural sector, but the profitability of all sectors in the economy. Section III presents an analytical framework which is used to assess the role of policy and nonpolicy variables on the relative price of agricultural goods. This framework demonstrates that current policies impose a heavy burden on farmers growing cotton and wheat under the state order system. Section IV goes on to show that while at the moment there is a large net transfer from the agricultural sector to the rest of the economy (engineered

[2] See Turkmenistan: *The National Program of President of Turkmenistan Saparmurat Turkmenbashy*, "Strategy of Socio-Economic developments in Turkmenistan for the Period up to 2010," Ashgabat 1999.

Table 1. Turkmenistan: Domestic Production of Selected Items, 2000–2010 1/
(Average annual growth rate during period; in percent)

	2000 2005	2005 2010	2000 2010
Total Agricultural Production	16.5	6.9	11.6
Grains	10.1	8.2	9.1
of which: Wheat	5.4	6.7	6.1
Corn	29.9	12.6	21.0
Barley	22.0	13.6	17.7
Cotton	11.2	3.3	7.2
Vegetables	14.9	10.5	12.7
Sugar beets	11.2	12.0	11.6
Light Industry			
Cotton fiber	11.2	3.3	7.2
Knitted linen	17.1	21.0	19.0
Cotton yarn	11.2	23.1	17.0
Knitted wear	11.2	26.0	18.4
Footwear	22.0	14.9	18.4
Food Industry			
Alcoholic drinks	12.5	4.1	8.2
Canned fruit & vegetables	5.4	4.2	4.8
Soft drinks	16.0	14.3	15.2
Macaroni	7.0	16.5	11.6
Mixed fodder	16.0	5.2	10.4
Sugar	16.0	12.0	14.0
Machinery Building Complexes			
Total mineral fertilizers	30.6	4.8	17.0
Equipment for food industry	13.7	7.3	10.4
Centrifugal pumps	14.9	5.4	10.0
Water and gas pipes	27.0	8.7	17.5
Aluminum castings	16.0	5.9	10.8
Construction Material Industry			
Cement	14.9	7.0	10.8
Tile	31.3	2.9	16.2
Construction glass	11.2	4.3	7.7

Source: Turkmenistan. The National Program through 2010.

1/ Other than energy sector production.

through the state order system and current trade and exchange restrictions), there is a considerable risk that this situation may reverse itself, if production yields were to lapse to 1996/98 levels. Moreover, it is shown that the opportunity costs of current agricultural policies are quite significant for the budget, the individual farmer, and the economy as a whole. Abolishing the state order system and allowing farmers to freely choose their crops could result in a sizable increase in value added and hence in an improved fiscal position on a sustainable basis over the short- and medium-term. Section V sketches an agenda for agricultural sector reform. The proposed policies would foster a better resource allocation,

create trade, and thus raise the standard of living of the population at large.[3] Section VI summarizes the conclusions and lesson from the analysis.

II. External Competitiveness Problem

Some general measures of competitiveness were calculated for Turkmenistan. These measures of competitiveness involve comparisons of movements in domestic prices and costs relative to those in major trading partners, converted to a common currency using the official nominal exchange rate. Despite the data limitations, the evidence below clearly suggests that Turkmenistan's external competitiveness has deteriorated sharply since 1995. The various measures of competitiveness indicate that both exchange rate and incomes/wage policies contributed in a major way to this deterioration.

Table 2. Real Exchange Rate Index, 1995–99 1/

	1995	1996	1997	1998	1999	
	Year	Q4	Q4	Q3	Q1	Q4
Turkmenistan/Armenia	100	193	231	262	316	347
Turkmenistan/Azerbaijan	100	172	200	216	290	361
Turkmenistan/Belarus	100	193	278	336	565	475
Turkmenistan/Estonia	100	184	236	246	290	342
Turkmenistan/Georgia	100	172	207	239	387	380
Turkmenistan/Kazakhstan	100	177	212	230	307	475
Turkmenistan/Kyrgyz Republic	100	217	256	302	481	584
Turkmenistan/Lithuania	100	173	200	212	255	284
Turkmenistan/Latvia	100	184	227	246	285	311
Turkmenistan/Moldova	100	174	199	221	387	441
Turkmenistan/Russia	100	193	235	326	576	606
Turkmenistan/Tajikistan	100	243	274	322	440	544
Turkmenistan/Ukraine	100	172	201	264	406	528
Turkmenistan/Uzbekistan	100	213	265	326	362	431
Turkmenistan/Egypt	100	182	221	233	283	302
Turkmenistan/Pakistan	100	217	278	308	368	n.a.
Turkmenistan/Syria	100	182	225	252	304	n.a.
Turkmenistan/India	100	193	251	263	323	346
Turkmenistan/Turkey	100	198	239	241	300	323
Turkmenistan/Poland	100	191	251	262	334	386
Turkmenistan/Czech Republic	100	183	267	240	331	368
Memorandum item:						
Average all countries	100	191	236	264	361	373
Average all BRO countries	100	190	230	268	382	436

Sources: EU2; and WEO data.
1/ An increase in the index indicates an appreciation of the manat vis-à-vis the currency of Turkmenistan's trading partner.

[3] The proposition that a country benefits from trade liberalization is old; it is grounded on the theoretical and empirical judgement that the free trade allows a country to maximize consumption, revenues taxed, and its comparative advantage in the world economy (see for example, Corden (1971), Johnson (1960), and Sjaatad (1975)).

Table 2 shows the unweighted real exchange rate of the manat vis-à-vis the currencies of other BRO countries and a sample of semi-industrialized countries. The real exchange rate appreciated significantly against the currencies of *all* other BRO countries during 1995/99. Of particular importance is the deterioration of Turkmenistan's competitiveness in the markets of its main actual and potential trading partners, including Russia, Ukraine, Turkey, Poland, and the Czech Republic. In addition, given the appreciation of the Turkmen manat against all other currencies in the sample, Turkmen products face a steep competition in the Russian, Ukrainian, and eastern European markets from competitor countries.

A second set of measures approaches competitiveness from the side of cost of production and estimates U.S. dollar unit-labor costs (ULCs). ULCs give indications of the cost of labor and implicitly compare the relative profitability of nonlabor factors and the incentives to shift nonlabor factors across countries. Table 3 shows the evolution of relative economy-wide U.S. dollar unit labor costs for Turkmenistan and all other BRO countries.[4] The data confirm that since 1995 Turkmenistan has become increasingly less able to compete in the domestic markets of other BRO countries. The sharp increase in Turkmenistan's ULCs relative to ULCs in other BRO countries has reflected a unique (for the region) threefold increase in real wages as nominal wages were increased by roughly 800 percent between 1995 and 1996, and doubled every year during 1997–99 (Figure 1). Combined with the noted overvaluation of the nominal exchange rate, this wage policy has raised sharply Turkmenistan's U.S. dollar wages vis-à-vis its main BRO competitors.

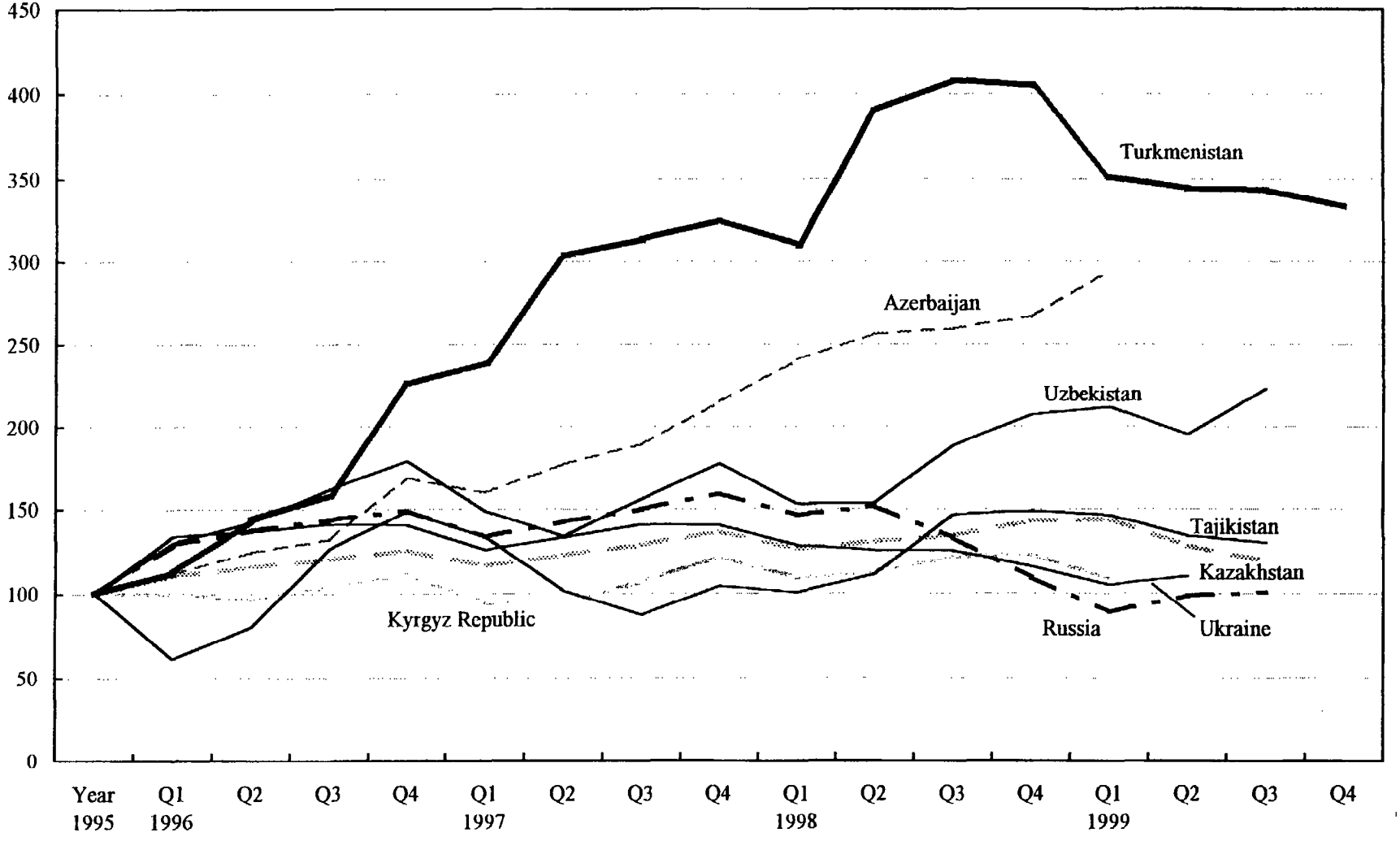
Table 3. Relative Dollar–ULC, 1995–98

	1995	1996	1997	1998	1999
Armenia/Turkmenistan	1.00	0.37	0.16	0.13	0.14
Azerbaijan/Turkmenistan	1.00	0.46	0.26	0.23	0.22
Belarus/Turkmenistan	1.00	0.41	0.13	0.10	0.07
Estonia/Turkmenistan	1.00	0.35	0.12	0.09	0.09
Kazakhstan/Turkmenistan	1.00	0.35	0.12	0.09	0.06
Kyrgyz Republic/Turkmenistan	1.00	0.31	0.10	0.07	0.04
Lithuania/Turkmenistan	1.00	0.39	0.16	0.12	0.12
Latvia/Turkmenistan	1.00	0.30	0.13	0.09	0.09
Moldova/Turkmenistan	1.00	0.31	0.16	0.12	0.07
Russia/Turkmenistan	1.00	0.46	0.18	0.09	0.05
Tajikistan/Turkmenistan	1.00	0.27	0.10	0.09	0.07
Ukraine/Turkmenistan	1.00	0.50	0.21	0.11	0.08
Uzbekistan/Turkmenistan	1.00	0.46	0.18	0.13	0.14
Memo item:					
Average all countries	1.00	0.38	0.14	0.10	0.09

Sources: EU2 databank; and staff estimates.

[4] Index values below 1.0 indicate that Turkmenistan's labor costs are relatively high and its exports are not competitive. Ideally, comparisons should be based on sectoral ULCs although (in the absence of such data) economy-wide indices can provide useful indicators of trends.

Figure 1. Selected BRO Countries: Real Wages, 1995-99
(1995 = 100)



Sources: European II, departmental database; and staff estimates.

III. Analytical Framework: Agricultural vs. Nonagricultural Goods

While the noted external competitiveness problem affects the whole economy, this section focuses on intersectoral relationships in Turkmenistan. To this end, an analytical framework is set out distinguishing between three broad classes of goods in the economy: agricultural, nonagricultural, and home or nontradable goods. Throughout this section, we abstract from the domestic production of energy-related goods (oil, gas, and derivatives) in which Turkmenistan has a world-wide comparative advantage. Instead, the analysis focuses on nonenergy (i.e., agriculture and nonagricultural) production and exports, and in those policies which could foster trade diversification over the short- and long-run.[5] The export diversification in which this paper is interested is that which occurs as a natural outcome of trade liberalization and increased competition, rather through the introduction of subsidies and other distortions to "force" diversification, as it is currently being done in Turkmenistan.

For the analysis, agricultural goods and nonagricultural goods are assumed to be exportables and importables, respectively. The relative prices—or real exchange rates—of agricultural and nonagricultural goods (in terms of home goods) are computed as follows:

$$Pa/Ph \qquad (1)$$

and

$$Pna/Ph \qquad (2)$$

where Pa and Pna are the producer price indices of agricultural and nonagricultural goods, respectively; Ph is the price index of home goods. Alternatively, by the law of one price and since Turkmenistan can be considered a price taker in both export and import markets, Pa/Ph can also be defined by means of an index of producer prices computed from f.o.b. export prices in dollars multiplied by the nominal exchange rate for agricultural exports and adjusted for taxes on exports:

$$Pa/Ph = [Px^* \; Ex \; (1-Tx)]/Ph \qquad (3)$$

where Px* is the index of foreign agricultural prices, Ex is an index of the nominal exchange rate for exports, Tx is the tax rate on exports, and Ph is the consumer price index (CPI) used as an indicator of home good prices.

In the case of nonagricultural goods, their real exchange rate could also be defined by means of an index of producer prices computed from c.i.f. nonenergy import prices in dollars multiplied by the nominal exchange rate for imports and adjusted for taxes on imports:

$$Pna/Ph = [Pm^* \; Em \; (1+ Tm)]/Ph \qquad (4)$$

---

[5] The links between the energy and nonenergy sectors are addressed in section IV, below.

where the symbols represent the same concepts in equation (3) except that imports (m) have replaced exports (x).

Equations (3) and (4) show that changes in relative prices could be the result of changes in ***policy and nonpolicy variables***. For example, changes in the country's external terms of trade would raise/lower Px* relatively to Pm*. For a small open economy, these price changes are exogenous and beyond the local authorities' control. In contrast, there are a number of policy variables which could be used by the government to alter relative prices in the economy. These include changes in exchange rates applied to exports and imports (Ex and Em) and/or changes taxes in levied across economic sectors (Tx and Tm), as shown in equation (5), below:

$$Pa/Pna = [Px^* Ex (1- Tx)]/[Pm^* Em (1+ Tm)] \qquad (5)$$

In particular, equation (5) shows that increases in export or import taxes (Tx, Tm) lower the relative price of agricultural goods (Pa/Pna). Changes in Ex and Em also alter equation (5).

Data for Turkmenistan show that the relative price of agricultural goods (Pa/Pna) has declined significantly in recent years (Figure 2). The largest decline in relative price has been for raw cotton. Wheat producers and cotton exporters have done somewhat better than cotton farmers, but have still faced an increasing price disadvantage vis-à-vis businesses in other sectors of the economy.

A tempting explanation is to say that the relative price developments since 1993 have reflected a deterioration of Turkmenistan's external terms of trade. However, world market price developments since the breakup of the Soviet Union show that this has not been the case. Indeed, Turkmenistan's import unit prices (proxied by U.S. manufacturing export prices) have been broadly stable during the last decade,[6] while world market prices for cotton and wheat had a burst between 1992/1996, which was only gradually reversed during 1997/1999 (Figure 3). Some of the price bonanza of the early 1990s may have even returned in 2000, according to prices in the futures commodity market.

Therefore, our first conclusion from the data is that the decline in the relative price of agricultural goods has reflected ***policies*** applied by the Turkmen government. The main factor depressing the real price of agricultural commodities has been the current system of *state procurement prices* (net of subsidies) paid to cotton and wheat farmers (Pa in equations 1-5). Also, the imposition of *trade barriers*, including quantitative export and import restrictions implemented by the State Commodity Exchange (Box 1), has depressed the financial return from export activities, [Ex (1-Tx)] in equation (5), vis-à-vis the return from imports, [Em (1+Tm)], thus lowering the relative price of agricultural commodities and providing incentives for the development of import substitution industries.

---

[6] Adjusted for product quality/innovation, import unit prices most likely declined over the last ten years.

Figure 2. Turkmenistan: Prices of Agricultural and Non-agricultural Goods Relative to the Price of Home Goods, 1993-99
(Log scale, Dec. 1993=100)

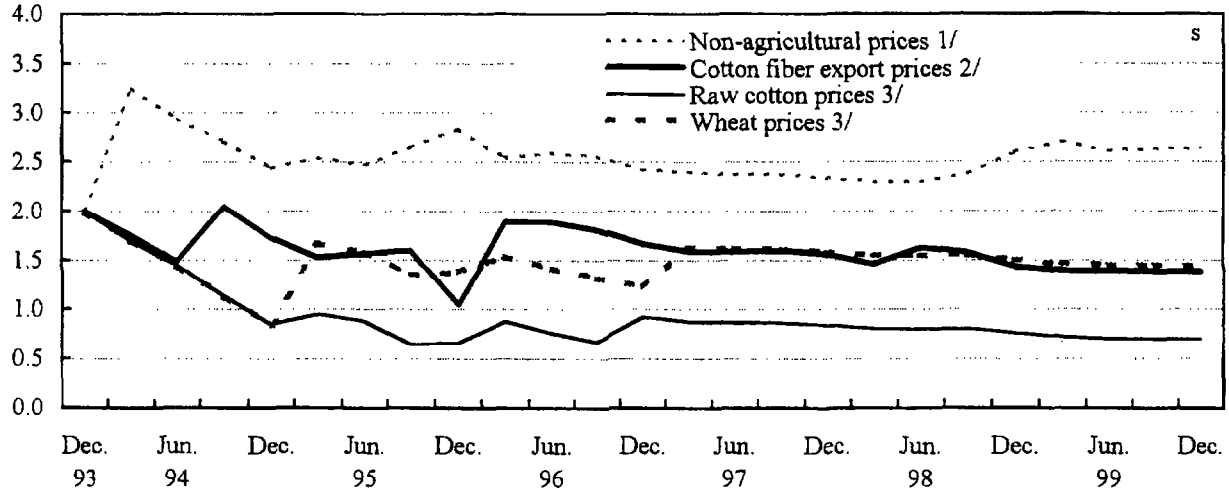
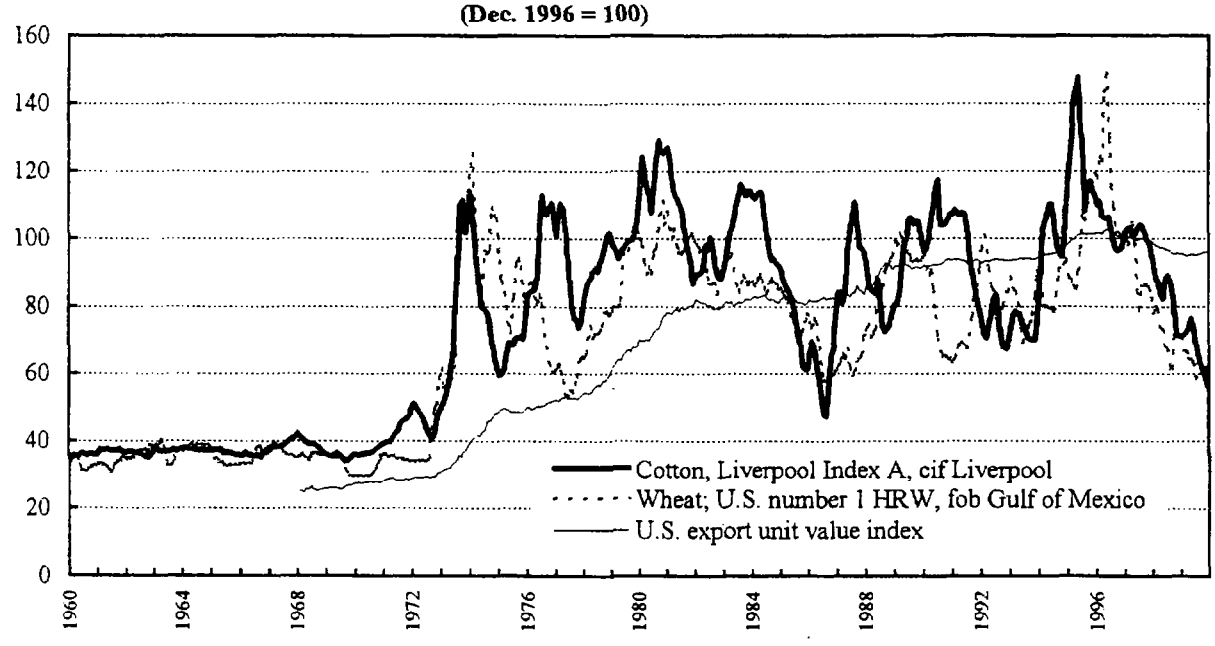


Figure 3. World Commodity Price Indices, 1960-99
(Dec. 1996 = 100)



Source: IMF, World Economic Outlook and Commodity database.

1/ U.S. export unit value index adjusted by nominal exchange rate and import taxes.
2/ Export price net of taxes and appropriations (in manat).
3/ State procurement price (in manat).

Box 1. The State Commodity Exchange (Comex)

Comex was established in 1994, with the following tasks:

1. To facilitate the provision of goods to the economy by matching buyers and sellers.
2. To regulate export and import transactions, including approval of export and import contracts.
3. To regulate prices in export and import contracts and the costs of investment contracts.
4. To regulate barter contracts.
5. To conduct marketing studies to identify the cities and rural areas that are under-supplied with various goods.
6. To study import opportunities for products that are in excess demand in the economy.
7. To develop wholesale business in Turkmenistan.
8. To assist Turkmen exporters in finding potential markets.

All contracts of international and domestic transactions that have a value in excess of 30 million manat (about US$5,700 at the official exchange rate) must be registered at the Comex. The rule applies to both public and private companies. All trade must take place through trading session at the Comex, which are conducted three times a week. The Comex may not approve a contract if in its view the contract price is not correct.

The Comex applies various criteria to regulate **export contracts**. Generally, the export contract should not be under-invoiced and goods to be exported should not be in short supply in the domestic market. To check whether the quoted price is appropriate, the Comex compares it to the price of similar products abroad, using various databases, including searches on the Internet. Some products, including certain foodstuffs, are prohibited from being exported.

Import contracts should not be over- or under-invoiced, and usually there should not be a local producer producing similar goods. If a locally produced alternative is available, import may still be allowed upon paying a surcharge over the import price. The Comex performs the same price checks as in the case of exports.

Domestic contracts are regulated in a similar way, with the Comex reviewing prices for each product traded. The buyer applying to purchase a product should present evidence of having sufficient money in his bank account.

Barter contracts must be registered, with the parties required to declare the prices at which the trade is to take place. Barter deals are channeled through the trading sessions. "Prices" of barter contracts are checked by the Comex in the same manner as those of other contracts.

State procurement prices have averaged around 50–60 percent of world market prices of cotton and wheat, valued at the official exchange rate, and even less than that when valued at the curb market exchange rate. At 1999 production yields, these procurement prices—net of subsidies in the form of underpriced inputs and mechanical services supplied to farmers—result in a net transfer of resources from the agricultural sector to the rest of the economy equivalent to 15 percent of GDP (Table 4), which is very large by any standards. About

Table 4. Turkmenistan: Estimated Transfers to and from Agriculture in 1999
(In billions of manat)

	Wheat	Cotton	Total
1 Production (thousand tons)	1,500	1,300	2,800
2 Value of output at international prices at manat 9,000/$ 1/	1,917	3,978	5,895
3 Value of output at international prices at manat 5,200/$ 1/	1,108	2,298	3,406
4 Value of output at procurement prices 2/	600	1,300	1,900
5 Difference between 2 and 4	1,317	2,678	3,995
o/w due to overvalued exchange rate	809	1,680	2,489
6 Subsidies: - seeds, fertilizer, credit costs, Mechanical services 3/	436	394	830
- irrigation	...	...	285
7 Net transfer out of agriculture (2 - 4 - 6)			**2,880**
in percent of GDP			**15.1**
o/w due to overvalued exchange rate (2 - 3)			2,489
in percent of GDP			13.0

Sources: Turkmen authorities, TACIS; and IMF staff estimates.

1/ Based on an ex farm gate wheat price of US$ 142/ton and raw cotton price of USS 340/ton.
2/ Procurement price for wheat of manat 400,000/ton and manat 1,000,000/ton for cotton.
3/ Estimated subsidy of manat 728,000/ha for wheat and manat 657,000/ha for cotton and assuming 600,000 ha sown with wheat and 600,000 ha with cotton.

2 percentage points of GDP in transfers are due to differences between state procurement and world market prices for cotton and wheat, net of subsidies.[7] This is what farmers would earn if they were free to export their production at current exchange rates. The rest of the transfer is due to the difference between the value of production at world market prices using the current official exchange rate (of manat 5,200 per U.S. dollar) and a more depreciated rate of say, manat 9,000 per U.S. dollar, for valuing export proceeds.[8] This is a proxy of what

[7] According to the experts, government subsidies have had detrimental effects not only for production and productivity, but also for the environment and health of parts of the Turkmen population. In the case of water resources, for example, the Turkmen authorities take the view that water should be free both for domestic and agricultural use. However, this lack of economic incentives to save the resource (i.e., zero marginal cost for the water user) has led to excessive application of water to irrigated fields. This, combined, with inadequate drainage systems has led to a rising water table and salinization of irrigated land. Another result of poor water resource management has been a serious damage to the environment, with the Aral Sea being on the brink of destruction as more and more water from the Amaudaria River is diverted for agriculture and never reaches the Sea.

[8] In 1999, the curb market exchange rate averaged manat 15,146 per U.S. dollar.

farmers would get if the government were to liberalize the exchange and trade system.

Trade restrictions and protectionist measures implemented by the State Commodity Exchange or Comex have also depressed the relative price of agricultural goods. First, export licensing procedures (together with the system of state procurement of wheat and cotton) have discouraged and/or banned exports of cotton, wheat, and certain industrial goods outside the state order system.[9] Second, import licensing requirements (together with differential excise duties levied on domestically-produced and imported food and nonfood items) have provided incentives for import substitution activities in the areas of cotton fabrics, knitted garments, alcoholic beverages. Imports of consumer goods have been allowed only if the goods were not produced domestically or whenever domestic production was insufficient to meet total demand. A lesser degree of protection at the level of capital goods has allowed the importation of machinery and equipment for the energy and agricultural sectors, which have been usually financed by foreign borrowing.

IV. Estimated Costs of Current Agricultural Policies

In a market economy, the decline in the relative price of agricultural goods, together with the government-engineered transfer of resources away from this sector, would have triggered a reallocation of economic resources. These distortions would be expected to result in a shift of resources away from agriculture (reducing the supply of cotton and wheat) into the nonagricultural or import substitution sectors of the economy. In Turkmenistan, however, remnants of a command economy have prevented such a reallocation of resources.[10] This way, the government has coaxed farmers into the production of wheat and cotton despite the underlying relative price misalignment and intersectoral transfer of resources.

While the Turkmen authorities may strive to keep agricultural policies broadly unchanged over the next decade, their strategy is unsustainable. For one thing, the current system of agricultural policies may be very risky ***for the budget*** and could have serious budgetary implications for the medium-term. As noted above, current agricultural policies result in a net transfer of resources from the agricultural sector to the rest of the economy equivalent to 15 percent of GDP. However, *if production yields were to decline from their 1999 peak to their 1996-98 average, the value of agricultural production (priced at current state procurement prices) would be less than the value of the subsidies transferred to farmers* (Box 2). The exchange rate tax levied on farmers would also shrink significantly (to some

[9] Almost all cotton and wheat is sold on state order in Turkmenistan.

[10] An illustrative example of this is that farmers can only obtain "ownership" of their land if they are deemed to be "good farmers" in the eyes of the state. The latter depends on whether the farmer meets the state order targets over a number of years.

8 percent of GDP) and might not be sufficient to pay for the internal and external resource cost of the current development strategy.[11]

Box 2. Policy–Induced Transfer at Alternative Production Yields
(In percent of GDP)

	Domestic Production 1/		Gains to		
	Wheat	Cotton	Wheat 2/	Cotton 2/	Importers and rest of the economy
I. At 1999 yields	3.2	6.8	-3.9	-11.2	15.1 (2.1)* (13.0)**
II. At reduced 1999 yields	2.1	5.2	-1.6	-7.8	9.4 (0.0)* (9.4)**
III. At 1996/98 average yields	1.3	4.7	0.1	-6.7	6.6 (-1.2)* (7.8)**

Source: Authors' calculations.

1/ Wheat and cotton production valued at state procurement prices of manat 400,000/ton for wheat and manat 1 million/ton for cotton.
2/ Due to differences between output valued at state procurement prices and international prices (using exchange rate of manat 9,000/U.S. dollar), net of government subsidies on agricultural inputs (e.g., seeds, fertilizer, mechanical services, and irrigation).
* Difference between value of production at the official exchange rate, and procurement prices and subsidies received by farmers.
** Difference between exports valued at the current official exchange rate and at rate of manat 9,000/U.S. dollar.

Moreover, the opportunity cost of growing cotton and wheat is very high for the average farmer and the economy as a whole. ***For the average farmer***, revenue and expenditure data show that cultivating fruits and vegetables is much more profitable than growing wheat or cotton (Table 5, columns 5 and 7). Notably, possible returns of producing, for example, sun-dried tomatoes could be more than twenty four and fifteen times higher than growing wheat and cotton under the state order system, respectively. Returns from producing dried fruit (raisins) could be seven times higher than growing wheat and 4.5 times higher than growing cotton, both under the state order system. Recalculating input costs by eliminating the state order system for wheat and cotton, removing existing interest rate and other subsidies to agriculture, and pricing labor at an assumed "shadow" price equivalent to 75 percent of its

[11] Estimates in Box 2 (middle panel) show that the value of agricultural production would equal the value of subsidies, if 1999 production yields fall by one third.

actual price,[12] shows that profits from growing either sundried tomatoes or raisins remain a multiple of the financial returns from growing traditional crops (Table 5, columns 6 and 8).

Table 5. Turkmenistan: Farm Crop Return and Cost Estimates
(Per hectare, in thousands of manat)

	Wheat 1/		Cotton 1/		Sundried tomatoes		Raisins	
	State Order System (1)	Liberalized regime 2/ (2)	State Order System (3)	Liberalized regime 2/ (4)	Actual (5)	Revised 3/ (6)	Actual (7)	Revised 3/ (8)
Sales proceeds	1,600	2,954	3,000	5,304	34,320	34,320	13,585	13,585
Input costs	823	1,482	1,768	2,113	15,011	12,588	7,952	6,221
Profit (before taxation)	777	1,472	1,232	3,191	19,309	21,732	5,633	7,364
Memorandum item:								
Exchange rate (manat/US$)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2

Sources: EU-TACIS, Turkmen authorities; and IMF staff estimates.

1/ Assures procurement price of manat 400,000 per ton of wheat and manat 1 million per ton of raw cotton.
2/ Eliminating state order system, as well as removing interest rate subsidies and pricing labor at its "shadow" price. Sales proceeds based on world market prices as of early 1999.
3/ Pricing labor at its "shadow" price.

For the economy as a whole, the relationship between value added and input costs (raw materials and imported goods and services) under alternative crops gives an indication of the potential real income gain from abandoning the state order system for wheat and cotton (Table 6).[13] At 1999 world market prices for both commodities, the data show that if manat 1,000 were allocated evenly between these two crops, the increment to Turkmen value added would be about manat 3,200. If the same resources were allocated to the production of sundried tomatoes, the increment to the economy's value added would be manat 6,900. Further, manat 1,000 allocated to the production of raisins could yield about manat 15,200. If those raisins were exported, Turkmenistan could pay for almost 5 times as many imports as it could producing cotton and wheat. Exports of raisins could pay for 8 times as many imports

[12] The price of labor is likely to be overvalued as it is often the case in developing and transition economies with generous income policies that alter the equilibrium of labor markets.

[13] Bruno (1962) and Krueger (1966) use a related approach to assess the economic costs of exchange controls in Israel and Turkey, respectively.

Table 6. Turkmenistan: Breakdown of Alternative Crop Output into Primary Inputs and Value Added 1/
(Per hectare; in manat)

	Wheat	Cotton	Sundried tomatoes	Raisins
Sales proceeds 1/	2,953,600	5,304,000	34,320,000	13,585,000
Raw materials and inputs	1,040,000	962,000	4,342,000	840,000
Value added	1,913,600	4,342,000	29,978,000	12,745,000
Value added per manat 1,000 in inputs	1,840	4,514	6,904	15,173
Memorandum item:				
Exchange rate (manat/US$)	5,200	5,200	5,200	5,200

Sources: EU-TACIS, Turkmen authorities; and IMF staff estimates.

1/ Based on world market prices in early 1999, ex-farm gate (i.e., after deducting costs of transportation and bulk packing).

as would producing wheat alone. Interestingly enough, with weather conditions similar to those in Turkmenistan, countries like Iran, Turkey, and Greece already produce more than half of the world supply of raisins.[14] Moreover, the recommendation of moving forward with market-based agricultural development and exports of fresh and processed fruits is reminiscent of the World Bank's policy advice for Turkey in the early 1980s (see World Bank (1982)). Turkey, as well as other countries around the world (like Chile, for example), are cases of strong output response in agriculture to the right economic policies.

In other words, the technical coefficients and world prices in Table 6 suggest that if one fourth of the land currently allocated to growing wheat and cotton (totaling about 1.2 million hectares) was allocated for producing raisins and sundried tomatoes, these producers would hire manat 0.75 trillion of resources to produce goods with an international value of US$1.4 billion (at an exchange rate of manat 5,200 per U.S. dollar). If the same hired resources were used in wheat and cotton production, the resulting international value of output would be only US$0.3 billion. The trade-offs in terms of dollars forgone by the economy are not insignificant, as US$1 billion is more than Turkmenistan's total annual external debt service obligations. Another key macroeconomic aspect is that the suggested crops (raisins and tomato) are more labor intensive and thus may help reduce rural poverty more than growing wheat, for example.

[14] According to the FAO Yearbook, the world demand for raisins have grown steadily since 1993, largely mirroring the growth in world food trade. Raisins' prices have been broadly stable during the last 7 years. Main consumers around the world include the G7 countries, the Netherlands, Russia, and the United Arab Emirates.

The "robustness" of the proposition that Turkmenistan should aggressively move into the production on nontraditional crops was checked and confirmed with the data. According to agricultural experts working in the country, the production of raisins and sundried tomatoes could be initially expanded at somewhat *constant costs* (i.e., the breakdown between value added and raw materials in Table 5 could be maintained at various levels of production). Currently, there is excess capacity in both lines of production as the Turkmen government invested heavily during 1993–96 on the construction of drying cabinets for raisins and tomato paste plants. These past initiatives, however, did not translate into a significant increase in production due mainly to the poor quality of the raw materials (as the best agricultural lands remained with the production of wheat and cotton) and not enough training for producers, processors, and international marketing supporting units. These are conditions which, of course, would need to change for achieving both quality improvements on export commodities and the overall success of the proposed reform strategy. Moreover, another policy area which would also need to be revisited in the years ahead refers to the proper valuation of scarce water resources in Central Asia. This policy area would require international cooperation and may dictate a thorough revision of sectoral production costs and economic policies in all countries connected to the Aral Sea.[15]

Finally, a shift in production from wheat and cotton to fruits and vegetables would also be beneficial to the budget. Revenues could increase by an estimated 7 percent of GDP, while the elimination of subsidies could yield up to 6 percent of GDP in budgetary savings (Table 7).[16] About 70 percent of the total revenue gains represents the profit tax revenue (at a rate of 25 percent) which could be collected, if one fourth of the land now allocated to wheat and cotton would be reallocated to producing higher yielding crops like fruits and vegetables. The rest of the revenue forgone is the combined effect of existing tax breaks granted to farmers under the state order system. On the other hand, the bulk of the subsidies are government transfers to farmers in the form of subsidized input supplies, including water, and mechanical services used for harvesting and related activities. Contrary to the revenue which the government currently extracts from agriculture (Box 2, above), which is highly dependent on variable yields of production, the elimination of subsidies and the tapping of

---

[15] According to Spoor (1998), central Asian countries, including Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan, are very inefficient water users in the cultivation of cotton and grain. Lerman et al. (1996; page 153) notes that water volumes (per hectare) used in cotton in central Asia, particularly Uzbekistan, are the among the highest in the world; about 70 percent higher than the average for a sample of countries including Egypt, Greece, Pakistan, Syria, United States (California), and Australia. Technical coefficients on water requirements published by FAO (1977 and 1998) indicate that under proper irrigation practices, fruits, tomatoes, and other vegetables need less water than properly-irrigated cotton and grain production.

[16] The revenue forgone has severely limited the local authorities' ability to supply sufficient health and education facilities as most of the agricultural taxes accrue to this level of government in Turkmenistan.

the existing revenue forgone in agriculture would improve the budgetary position on a more predictable/sustained basis over the short- and medium-term.

Table 7. Turkmenistan: Tax Revenue Forgone from Agriculture
(In percent of GDP)

Increase land tax	0.4
Introduce taxation of wheat crop	0.3
Introduce VAT on other agricultural production, but with thresholds	0.9
Eliminate allocation of cotton crop to FERF and tax at effective tax rate of 15 percent	0.3
Subtotal	1.9
Shift one fourth of land used for cotton and wheat to higher yielding crops (fruits and vegetables)	4.9
Total	6.9
Memorandum item:	
Budgetary and off-budgetary subsidies	6.0

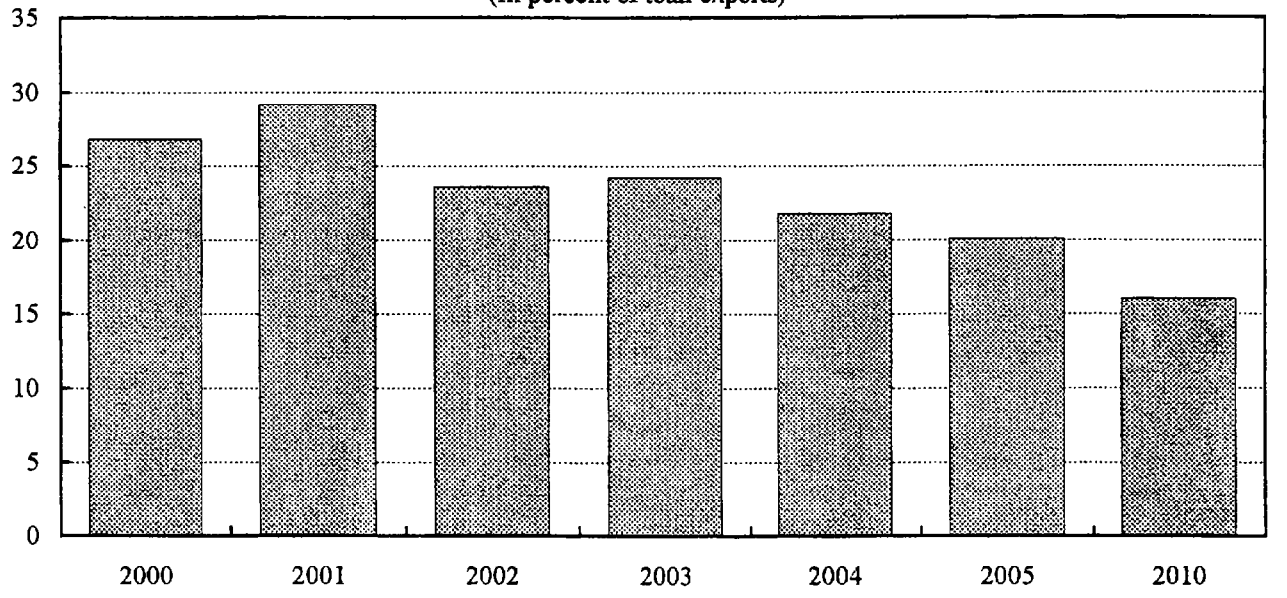
Sources: Authors' estimates.

The 2010 national plan appears to have ignored the very high rates of return and income gains for the economy from developing nontraditional crops. Indeed, production of canned fruit and vegetables is targeted to grow less rapidly than the average food industry, notwithstanding its low base of production to date. At the same time, the plan insists on a further substantial growth of wheat and cotton production, and a fivefold increase in corn, barley, and sugar volumes despite a reported sharp increase in ending stocks of these commodities in the international market (for corn and barley, in particular) between 1995/96 and 1998/99. Also, exports of manufacturing and agroindustrial products would remain a small share of total exports, as the bulk of the new domestic industrial output targeted decade is targeted for domestic consumption (Figure 4). The end result of this development strategy would be an unfortunate sharp reduction in the degree of openness of the Turkmen economy between 2000 and 2010 (Figure 5).

V. An Agenda For Agricultural Sector Reform

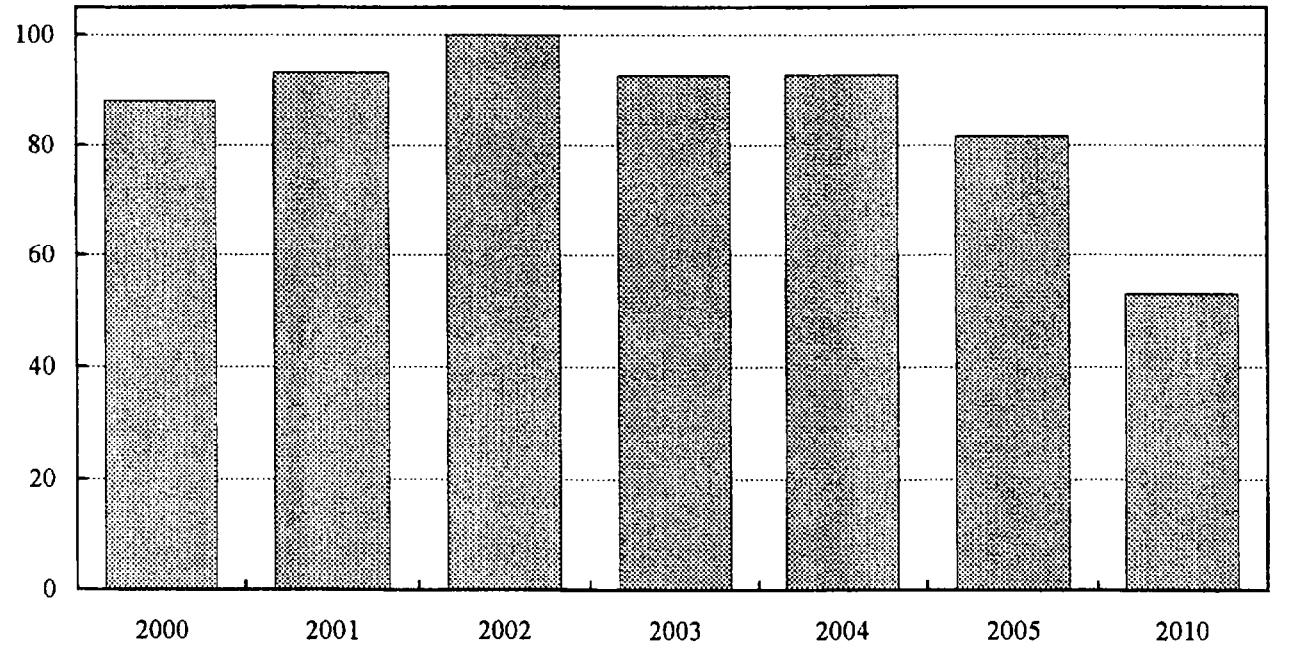
The analysis so far has concentrated on the effects of current government policies on the external competitiveness of actual and potential agricultural exports, relative prices, and the measurement of the opportunity cost for the budget, the average farmer, and the overall economy. This section elaborates on how to correct the economic distortions resulting from current policies, while taking into account the central role of oil and gas production in an energy-rich country like Turkmenistan.

Figure 4. Turkmenistan: Non-Energy Manufacturing Exports, 2000-2010
(In percent of total exports)



Source: Turkmen authorities, 2010 Development Program.

Figure 5. Turkmenistan: Openness of the Economy, 2000-2010 1/



Source: Turkmen authorities, 2010 Development Program.

1/ Exports and imports of goods in percent of GDP.

External competitiveness problem

Cross-country studies suggest that trade liberalization episodes accompanied by concerted policies that tackle an overvaluation of the national currency, remove quantitative trade restrictions, and include financial policies to reduce domestic and external imbalances enjoy superior trade volume growth and trade diversification than timid an uncertain trade liberalization reform efforts. [17]

In Turkmenistan, correcting the **overvaluation of the manat** would imply the liberalization of the foreign exchange market and a slowdown in nominal wage increases to foster a real depreciation of the national currency. As noted above, the real exchange rate of the manat appreciated continuously over the last five years. At the same time, average and minimum nominal wages for budgetary employees—a leading indicator for wage setting arrangements across the economy—have been increased at irregular intervals during the last seven years with no regard to underlying domestic and international financial conditions. The end result has been that domestic ULCs have increased very rapidly since 1995, making actual and potential agricultural exports less competitive in the world commodity market.

Trade restrictions also modify the short- and long-run level of the real exchange rate. The greater degree of trade restrictive policies in place, the smaller would be the impact of changes in the nominal exchange rate on agricultural exports. Specifically, while these policies may foster an increase in agricultural exports, quantitative import restrictions and import tariffs and quotas would prevent extra export proceeds from being spent abroad. Therefore, a trade surplus would be generated, foreign reserves would increase, and there would be an expansion of the money supply which would increase domestic inflation and appreciate the real exchange rate. In contrast, the more open the economy, the more enduring would be the correction to the level of the real exchange rate as extra export proceeds are spent abroad, minimizing the spur in domestic inflation.

In addition, the **stance of financial policies** would be fundamental in securing a lasting solution of the external competitiveness problem facing the Turkmen economy. Very often, countries try to improve their external accounts by implementing a real devaluation *without* taking the required additional measures for reducing aggregate expenditure relative to output. However, such an approach forces the central bank to issue base money with the end result that, as inflation increases, the initial real devaluation is gradually eroded over time.

Domestic relative price adjustment

Increasing the relative price of agricultural goods should be a main objective for improving the financial position of agriculture and agroindustry businesses. This would require: (a) correcting the existing misalignment between procurement prices (Pa) with world market

[17] See Michaely (1991) and Nogues and Gulati (1994) for a review of the experience on trade liberalization.

prices; (b) eliminating taxes on exports (Tx); and (c) dismantling trade and exchange restrictions implemented by the Comex, which tend to lower [Ex (1-Tx)] relatively to [Em (1+ Tm)]. As stated in equation (5) above, these policy options would raise (Pa/Pna) and presumably increase output and exports of these goods.

The notion here is that as Turkmenistan dismantles various restrictions and allows its trade pattern to be determined by market forces, exports will find new markets and new products will become exportable. Dynamic effects during the liberalization process caused by resource flows into new exporting activities will increase creativity and innovation, which in turn may result in further trade diversification.

Links between energy and agricultural policies

With new investments in the energy sector likely in the future, the links between energy policy and the liberalization of agricultural reform need to recognized from the outset. Multiple studies on the "Dutch disease" have shown that large foreign exchange inflows stemming from a natural resource boom—together with increases in current and permanent income—tend to appreciate the exchange rate and crowd-out investment in the manufacturing sector.[18] For Turkmenistan, this would mean that if agricultural sector reform were to proceed ahead of large new investments in oil and gas, the real exchange rate would initially depreciate, but it would subsequently appreciate with the natural resource to the frustration of those entrepreneurs who had been drawn into agro and agro-industrial export activities. As these business activities have risks and sunk-costs for investors, they would not be developed unless businessmen have some assurance about the expected path of the real exchange rate. Accordingly, it would be critical for the government to know to handle the real exchange rate appreciation connected with a possible boom in the energy sector.

While a detailed analysis on how to handle the main economic effects of a natural resource boom are beyond the scope of this paper, international experience has shown that a main tool for preventing an excessive exchange rate appreciation following a resource boom is to **open up** the economy to international trade, while at the same time pursuing macroeconomic and structural policies aimed at **increasing domestic savings** and **curbing the demand for foreign borrowing** to finance domestic absorption.

VI. CONCLUSIONS

This paper has looked at the need for agricultural sector reform in Turkmenistan from a macroeconomic point of view. A key message from this note is that poverty in agriculture (proxied by the low relative price of agricultural goods) is the result of government policies rather than the outcome of exogenous terms of trade changes and/or other variables outside the government's control. Low procurement prices for agricultural goods and the imposition of trade barriers, including quantitative export and import restrictions implemented by the

[18] See Rosenberg and Saavalainen (1998) for analysis and bibliographical references.

State Commodity Exchange, have depressed the financial return from export activities vis-à-vis the return from imports, thus lowering the relative price of agricultural commodities and providing incentives for the development of import substitution industries. The bias against agriculture has compounded the overriding external competitiveness problem facing Turkmenistan.

This bias is partly offset by the government's current strategy of heavily subsidizing farmers to keep production going, but at a substantial opportunity cost for the economy and the budget. In particular, the profitability of traditional crops (like wheat and cotton) is very low compared to that of alternative lines of production like fresh and canned vegetables and other agroindustrial activities which could have a niche in the international commodities market. At the same time, subsidization of traditional agriculture is a major resource drain for the budget and could be even more pressing as external debt service payments increase over the coming years.

A second message from this paper is that reform in agriculture cannot be a temporary concern for the government, but instead it requires continuous assessment and a comprehensive policy reform effort. This would imply exchange rate action (including conservative government income policies), the removal of quantitative import restrictions executed by the Comex, and the implementation of sound financial policies to seek a proper balance between aggregate output and expenditure. In this regard, a reduction of the consolidated public sector deficit (including the accounts of the state and the extrabudgetary funds) would be paramount in reducing inflation and keeping a stable real exchange rate for agricultural exports. Systemic reform regarding private ownership of land and the development of credible property rights would also be critical to foster agricultural growth of the coming years.

The 2010 national program targets a major increase in income per capita for Turkmenistan. The economic model behind the plan exacerbates import substitution, while keeping traditional export activities, like cotton, oil, and gas, as the main sources of foreign exchange reserves. An unfortunate result from this economic strategy is the large cost for the economy—in terms of forgone foreign exchange receipts—from pursuing traditional agricultural activities. Also, because of the program's inward orientation, the Turkmen economy would become less open to international trade over the next decade, an objective which is at odds with the experience of fast growing economies around the world. By contrast, this paper argues that raising the living standards of the Turkmen population can only be achieved through openness and trade liberalization, which, in Turkmenistan, includes a thorough revision of current agricultural policies.

Bibliography

Bruno, Michael (1962), *Interdependence, Resource Cost, and Structural Change in Israel,* Jerusalem, Bank of Israel, Research Department.

Cavallo, Domingo (1988), Argentina, in *The Open Economy, Tools for Policymakers in Developing Countries,* edited by Rudiger Dornbursch and Leslie C.H. Helmers, pp. 267–284.

Clements, Kenneth W. and Larry A. Sjaastad (1984), *How Protection Taxes Exporters,* Trade Policy Research Center, London, Thames Essay No. 39.

Corden, Max (1971), *The Theory of Protection,* Oxford: Clarendon Press.

FAO (1977), *Crop Water Requirements,* FAO Irrigation and Drainage Paper, No. 24, United Nations, Rome.

FAO (1998), *Crop Evapotranspiration: Guidelines for Computing Crop Water Requirements,* FAO Irrigation and Drainage Paper, No. 56, United Nations, Rome.

Johnson, Harry (1960), "The Cost of Protection and the Scientific Tariff," *Journal of Political Economy, Chicago*, August, pp. 327–45.

Krueger, Anne (1966) "Some Economic Costs of Exchange Control: The Turkish Case," *Journal of Political Economy, Chicago*, August, pp. 466–480.

Lerman, Zvi, Jorge Garcia-Garcia and Dennis Wichelns (1996), "Land and Water Policies in Uzbekistan," *Post-Soviet Geography,* 37(3), pp.145-174.

Michaely, Michael, et. al. (1991), *Liberalizing Foreign Trade, Lessons of Experience in the Developing World,* Volume 7, Basil Blackwell Inc.

Nogues, Julio and Sunil Gulati (1994), "Economic Policies and Performance Under Alternative Trade Regimes: Latin America During the 1980s," *The World Economy,* pp. 467–496.

Rosenberg, Christoph B. and Tapio Saavalainen (1998), *How to Deal with Azerbaijan's Oil Boom? Policy Strategies in a Resource-Rich Transition Economy*, IMF Working Paper, WP/98/6.

Rosenberg, Christoph B. and Maarten de Zeeuw (2000), *Welfare effects of Uzbekistan's Foreign Exchange Regime*, IMF Working Paper, WP/00/61.

Sjaastad, Larry (1975), "The Problem of trade liberalization in Chile," *Journal of World Trade Law*, pp. 160–176.

Spoor, Max (1998), "The Aral Sea Basin Crisis: Transition and Environment in Former Soviet Central Asia," *Development and Change,* Vol.29, pp.409-435.

World Bank (1982), *Turkey, Industrialization and Trade Strategy,* A World Bank Country Study, The World Bank, Washington D.C..