Distortions to Agricultural Incentives in Egypt

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Egypt is an ancient civilization but with a certain geopolitical regularity where agriculture and incomes are concerned. Foremost, for over 50 centuries there has been an inexorable pressure of a growing population against fixed resources – land and water. Additionally, for a very long time, local central rulers and an assortment of foreign powers have used control over limited agricultural land as a source of political patronage and "taxation" aimed to achieve particular ends. Historically, this has disadvantaged the rural peasantry despite periodic infrastructure investments and the introduction of lucrative new crops such as Egyptian cotton in 1820.

This study focuses on the period 1955-2005. In the early part of that era, despite an articulation of concern for the rural population, a policy emphasis on industrialization and "import substitution" met with mixed success as promotion of industry, tempered especially by the 1952 Revolution and ultimately Nasser socialism, reduced incentives to both the basic agricultural sector and to international trade. This, in turn, has held important implications for the prosperity of the population generally and especially for rural incomes in a country where even today one-third of the population is in the agricultural sector and more than one-half might be characterized as rural. The period since the mid-1980s is characterized by a policy reorientation away from state planning and toward reinvigorating the private sector, including agriculture.

Even though the current policy tendency leans clearly toward embracing markets and free enterprise, it is confronted with some burdensome legacies of the past. On the one hand, the Government of Egypt (GOE) is openly committed to the goal of increased incomes and employment for all Egyptians. To that end, the GOE has actively pursued sensible policies of macroeconomic stability, along with a strong commitment to private

sector development, privatization of state-owned firms, and legal reforms that affect investment. The GOE has also pursued a series of trade barrier reductions, including an abolition of most quantitative restrictions and significant reductions in tariffs, especially for certain key capital goods, as well as a number of regional and global free trade commitments. Although there was some hesitation in policy reform and relative economic stagnation from 2000 to 2003, bold reform once again seems to be well on track (Srinivasan 2005; IMF 2006).

However, the legacy of the past is daunting for even well-intentioned policy reformers. Historically, by the middle of the 20th century, a long period of widely unpopular European influence had left wealth concentrated in the hands of foreigners and a domestic elite.[1] Following the Revolution of 1952, and particularly after the Suez crisis of 1956 with its sanctions, the economy was realigned structurally. The state assumed ownership of the means of production, and it regulated prices. The public sector soon accounted for 75 percent of GDP, and with increased centralized planning came such things as directives as to what a certain product should look like and how it should perform. At the same time, foreign companies were nationalized, a result of which was that inflows of foreign investment virtually ceased.

In the 1970s, in response to slower growth, the "Open Door" policy began with its more outward-looking orientation. Since the 1980s, the pace of economic reform has increased, with an emphasis on reliance on markets, increased foreign trade and investment and, beginning in the 1990s, privatization. But the history of socialism and trade orientation toward Comecon countries has left many with a distrust of markets and of foreign trade. Add to this a stifling bureaucracy, and one can appreciate the difficulty in advancing deeply needed economic policy reforms.

Egyptian farmers grow a wide variety of crops – grains, cotton, sugar, berseem (clover), legumes, fruits, vegetables – as well as producing meats and dairy products. Over the years the agricultural and related sectors have been subject to significant policy

[1] Specifically, the period from 1840-1930, following Mohammed Ali's failed attempts to develop a protected industrial economy, was marked by agreements between the European powers and the Sublime Porte which underwrote ninety years of almost perfectly free trade. This ended in the period 1930-1950 as Egypt gained tariff autonomy and embraced protectionist policies. Additionally, during World War II a system of direct controls for distributing food and raw materials, and for regulating prices, was created and never fully dismantled after the War. (See Hansen and Nashashibi 1975, and historical references therein.)

interventions and large structural changes. For about ten years after the 1952 Revolution, agriculture continued to dominate output and employment, and cotton was the main export. The sector was driven by close to free market incentives. Since about 1960, however, owing somewhat to both direct and indirect policy interventions, agriculture has diminished in relative economic importance. Today it contributes only one-seventh of GDP, although agricultural employment remains disproportionately higher at around one-third. Meanwhile, agricultural exports have declined substantially in importance and agricultural imports of the staples wheat and flour have increased dramatically. Combined with the politically sensitive policy of substantial bread subsidies to consumers, the food policy today represents a large and growing drain on government finances that is difficult to sustain.

As livestock production has become more important, maize has increased in both domestic cropping and in imports. Berseem production has expanded as well, while rice production, perhaps subsidized more than any other crop by a policy of free irrigation water, remains important both for domestic consumption and somewhat as an export.

Although food security has always been and remains a priority, agricultural policies other than for water are largely oriented toward institutionalizing market incentives in production and, except for bread and to some extent edible oil and sugar, in consumption. This is the reverse of policies of the 1960s and 1970s. In that earlier period, policy emphasized the mobilizing of agricultural savings in order to subsidize the urban consumer and promote industrialization. In the Nasser era, there was also a technical motivation of altering the traditional biennial crop rotation which was believed to be harsh on the land. Consequently, market distrust meant virtually all farmers became members of cooperatives. The cooperatives, in turn, were run by government bureaucracies solely entrusted to provide inputs to and buy outputs from farmers at artificially low administered prices.

The Principal Bank for Development and Agricultural Credit (PBDAC), originally established in 1931, became the instrument of allocation for agricultural trade and finance. At the same time, some land reforms and rent controls were implemented, along with government-dictated cropping patterns. Most social histories recount that the system was highly inefficient and somewhat corrupt, probably exploiting the rural

peasantry to the benefit of a controlling class at the village level of “rural notables.” Certainly agriculture generally was extremely repressed. Even relatively freely traded agricultural products – livestock, certain animal feeds, and some horticulture –suffered from high industrial trade protection and an overvalued currency.

Important market-oriented reforms began in 1986, the terminal year in the case study by Dethier in Krueger, Schiff and Valdez (1991), and by 1994 the private sector was substantially enfranchised once again. Egypt by 2006 had engineered a remarkable, almost unprecedented, reversal of its agricultural policies. Nonetheless, as we report below, some indirect disincentives to the agricultural sector remain, and the sugar sector continues to be the purview of the GOE. Also, food consumer policy, particularly untargeted bread subsidies, remains problematic.

The remainder of this study attempts to amplify the policy discussion and to quantify its impacts on incentives. The study first provides a brief history of growth and structural changes in the Egyptian economy over the past 50 years. It then recounts the evolution of agricultural policy since 1955 before providing measures of the extent of distortions to incentives. An analytical narrative of policy evolution is followed by some conclusions concerning food policy, rural incomes and the prospects for future national policy reform.

Growth and structural change in the Egyptian economy: 1955 to 2005

Egypt’s economy has grown unevenly over the past 50 years, driven by population growth as much as investment, and structurally impacted by significant policy swings. The period is marked first by the rapid nationalization of industry and the move toward “import substitution” and central planning, and then by the equally rapid reorientation of the economy toward reliance on markets, private property, and integration into the world economy. These policy swings have applied to both the agricultural and non-agricultural sectors, although the emphasis on heavier industry in the early years clearly penalized agriculture indirectly. Also, in the reform period, import substitution policies and tariff

escalation have been dismantled more slowly relative to the pace of other reforms, so some bias against agriculture continues.

Demographically, the population grew from about 25 million to around 75 million over the time period. The bulk of that growth was in the non-agricultural population, rising from 30 percent to over 60 percent, although the "rural population" actually stayed proportionately constant at more than one-half.

The trend is reflected in the labor markets where the labor force grew from 6 million to 20 million, but agricultural labor fell as a proportion from over half to just one-third. With such rapid population growth, the population is demographically quite young, posing a challenge for the economy to absorb the burgeoning cohort of new entrants into the labor force.

Overall, GDP and especially GDP per capita have grown somewhat haltingly. Meanwhile, agriculture has fallen from 30 percent of GDP to about 14 percent, and manufacturing has grown to more than the size of the agricultural sector. The remainder of GDP is comprised of oil and gas, plus government and other services. The composition of primary agriculture by product over time for the 70 percent of products covered in this study (at current distorted prices) is shown in Figure 1, where the contraction of the cotton sector and growing importance of livestock and horticulture are evident.

Export and import trends have been in secular decline. Except for a few commodities – cotton in the early period, gas and oil, Suez Canal services, garments, and tourism in the later years – Egypt essentially disengaged from international commerce. As a share of GDP, merchandise exports have fallen from an average of over 10 percent prior to the 1990s to about 5 percent since the early 1990s. For imports the comparable shares are 27 percent and 16 percent (WDI 2006). Egypt's share of world trade was substantially larger in 1975 than it is today. Imports remain few and exports plus imports as a share of GDP has fallen, raising the spectre that economic reform has been somewhat anti-trade biased in that dismantling the import-substitution policy of yesteryear has received lower priority. Foreign exchange earnings still rely significantly on repatriated wages by Egyptians working abroad and on foreign aid. Foreign investment, which was all but frozen in the early years, remains fairly low relative to other developing countries,

and some of it is driven by “tariff jumping” into heavily protected industrial sectors of the economy (Nathan Associates 2002).

The commodity composition of trade has changed considerably over the period. Agricultural products, mostly cotton, no longer dominate exports, while gas and oil (“other primary exports”) have increased substantially since the return of the Sinai oil fields after the 1973 war. Imports continue to be mostly manufactures, particularly capital goods and especially oil-industry related, but food imports – especially wheat and flour – still represent 20 percent of merchandise imports despite a concerted effort to decontrol farm-gate prices and achieve self-sufficiency in flour for bread production.

The foreign trade sector notoriously reflects a substantial anti-trade bias owing to a host of direct and indirect policy interventions, most notably significant tariff and non-tariff trade barriers escalating in favor of industry, and an overvalued exchange rate for most of the period until about 1997 (Nassar and Aziz 2000). In the late 1990s, agricultural production was penalized by much higher levels of protection for manufacturing (Appendix Table 1), and this was amplified by non-tariff barriers such as “red tape” costs of importing and a restrictive system of standards and quality control (Nathan Associates 1996, 1998).

In the past decade, tariff and trade reform appears to have had little impact on the extent of tariff escalation between primary agriculture and processed food, and the tariff decline for primary agriculture, from 4.6 percent in 1995 to 1.9 percent in 2005, has widened the gap between it and tariff protection for non-agricultural primary sectors which has remained steady at over 10 percent on average (UNCTAD-TRAINS 2006).

The exchange rate appeared to be overvalued in the 1960s and 1970s, since it was well below the black market rate, but devaluations in the late 1970s, the late 1980s and during the current decade have corrected its misalignment periodically (Appendix Figure 3). The inflation rate varied, but exceeded 10 – 15 percent for much of the 1970s and 1980s before falling substantially in the 1990s.

Policy evolution

Economic performance is tied to events and to policy. From 1950 to 1952, the annual rate of GDP growth was 7-8 percent (Al-Sayyid 2003). However, after the Revolution of 1952 the growth rate declined sharply until 1955 and then there was a slow recovery in 1955-1956 (Mabro 1974). This was also a period of political instability and, despite some effort to attract foreign capital, low foreign investment. Income and wealth were highly skewed: 1 percent of the farm population received 39 percent of total agricultural income, while the 80 percent that comprise landless and poor peasants received just 29 percent of agricultural income (Abdel-Fadil 1975, 1981). In the urban areas, the poorest 60 percent of the population received 18 percent of total personal income while the top 1 percent received 11 percent.

From 1956 until about 1966, the economy was marked by a rapid swing toward state socialism. While the Organization of Free Officers that took power in 1953 had no strong unanimously held views on economic policy, other than for "social justice" and land reform, the genesis of the policy shift resided in the political events that shifted Egyptian trade from West to East (Nutting 1972; Hansen and Nashashibi 1975).[2] The public sector expanded and came to dominate the economy with a large number of public enterprises. A period of agrarian reform reduced maximum landholding to 100 acres per family and saw the beginning of state planning and procurement policies for most of the major crops. Growth was actually fairly high in this period, about 8-12 percent (Al-Sayyid 2003), but central planning was beginning to show strains.

The period between 1967 and 1973 began and ended with wars. Economic growth slowed to 3.1 percent following defeat in the June War of 1967, when emphasis was put on industrialization and the maximum farm landholding was lowered in 1969 to fifty acres per family.

From 1975 until the early 1980s, the Egyptian economy grew at about 6 percent per year. But much of this performance was due to one-off factors such as the return of oil fields after the 1973 war, the rise in oil prices in 1973 and 1979, increased use of the

[2] These events included the Egyptian-Czechoslovak arms deal of 1955, relations with the U.S. concerning the World Bank Aswan High Dam loan, the Suez Canal nationalization, the British-French-Israeli aggression and the Suez War, and the subsequent foreign exchange and trade blockade by the U.S., Britain, and France.

Suez Canal, inflows of remittances from expatriate workers, and the rapid infusion of external assistance. Savings were low, non-oil manufactured exports were almost non-existent, public firms dominated the industrial sector, and there was crumbling infrastructure along with low investment (Ikram 2006).

The sharp fall in oil prices in 1982 made the weaknesses apparent and by 1991 the situation was untenable: the budget deficit was 20 percent of GDP, inflation was almost 15 percent and rising, real interest rates were negative, and external debt was rising as foreign exchange reserves dwindled. At this point, the GOE began to develop a fairly sound macroeconomic environment, such that by 1998 inflation was 3.8 percent, real interest rates were positive, external reserves were much higher, and external debt was manageable.

Also, significant structural reforms began as some public firms were privatized, a trend which accelerated after 1996. The financial sector was liberalized a little, including through passing a law that allowed private sector ownership. There were some trade reforms too, although tariff and non-tariff barriers remain relatively high and tariff escalation increased. Some attention also was paid to widespread human resource development needs, in the hopes of alleviating poverty.

The results of the reforms have been mixed but, from a historical perspective, there has been substantial progress toward developing a market oriented, outward-looking economy.

From the early 1960s until the mid-1980s the agricultural share of GDP and employment declined significantly, even though absolute employment and population numbers in rural areas remained high so that the proportions were still 34 percent and 50 percent, respectively. The relative stagnation of the sector was mainly due to government intervention in agricultural production, marketing, and pricing (Siam 2005). Administered prices were far below border prices, representing a heavy “tax” on the sector, as the central government sought to transfer the agricultural surplus to finance the development of the non-agricultural sectors. Confronted with low profitability in agriculture, land productivity declined and labor began to migrate out of agriculture to non-agricultural job opportunities both in Egypt and abroad, for example in Iraq, Gulf countries and Libya.

These interventionist farm policies began to be reversed in 1986, when the GOE took action to transform the economy gradually by reducing its role and increasing the role of the private sector, with the objective of increasing the efficiency of the use of agriculture resources in particular and economic resources generally. This was achieved through two stages. The first period (1986-1990) focused on direct distortions in agriculture. It involved complete or partial liberalization for the prices of ten main crops; reduction or elimination of the obligatory deliveries of the strategic crops; cuts in subsidies on farm inputs; elimination of the government monopoly on major farm inputs and strategic crops; and expansion of the market for private investment.

The second stage (1990-1997) addressed indirect distortions affecting agriculture by implementing the general macroeconomic reforms discussed above, including a free market determined exchange rate and some liberalization of foreign trade.
All of this affected agricultural output and agricultural trade. Historically, cotton lint dominated Egyptian exports, representing nearly 80 percent of all commodity exports in the early 1960s. Rice has been the other significant agricultural export. However, both items have fallen in importance relative to total commodity exports – now dominated by oil and gas – as well as relative to other agricultural exports, notably horticulture (Appendix Figure 2(a)).

Agricultural imports also were affected. As shown in Appendix Figure 2(b), imports of maize, sugar, and especially wheat have represented nearly half of all commodity imports throughout the period studied. Maize has grown in importance, reflecting the expansion of domestic livestock industries. Wheat and flour remain substantial imports despite considerable recent policy efforts to encourage domestic wheat production and a publicly articulated, if somewhat unrealistic, goal of wheat self-sufficiency.

These imports are in turn integrally related to the long-standing and politically sensitive policy of substantial bread (baladi) subsidies to all consumers. Throughout most of the study period, bread has been sold on the street at 20-30 percent of its border price equivalent. Since a government procurement subsidy accounts for the difference, and since bread is a staple in the Egyptian diet with consumption of almost half a kilo per capita per day, the food policy has become a significant drain on government revenues

representing nearly 2 percent of GDP. Some sugar and cooking oil is also substantially subsidized in consumption, but these are subject to rationing.

In the next section, measures of the magnitude of the distortions for five major crops plus meat and dairy are summarized. That is followed by a discussion of the specific policies and policy motivations by commodity.

Measures of distortions to agricultural incentives, 1955 to 2005

Using the methodology of the project (Anderson et al. 2008), we quantify the extent of direct and indirect distortions affecting the agricultural sector in Egypt. The main focus is on government-imposed distortions that create a gap between domestic prices and what they would be under free markets. Since it is not possible to understand the characteristics of agricultural development with a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market), but it also generates estimates of distortions in non-agricultural sectors for comparative evaluation.

More specifically, this study computes a Nominal Rate of Assistance (NRA) for farmers including an adjustment for direct interventions on inputs. It also generates an NRA for nonagricultural tradables, for comparison with that for agricultural tradables via the calculation of a Relative Rate of Assistance (RRA – see Anderson et al. 2008).

The analysis considers five import-competing products (maize, sugar, wheat, meat and milk) and two exported crops (cotton and rice). These products constitute around 70 percent of primary agricultural output. For sugar, rice and cotton, we also report on both the primary commodity (cane sugar, paddy rice, and seed cotton) as well as the lightly processed derivatives. We have not focused specifically on berseem, which is an important feed input for livestock but is rarely traded, nor on horticulture which consists of essentially undistorted commodities.

Nominal rates of assistance and consumer tax equivalents

As noted above, the NRA measures can include policy-induced input price changes. While some inputs have been subsidized in Egypt – especially water, fertilizer, and pest control – we have mostly ignored this channel of assistance. Thus our NRA estimates are mostly NRAs on output.

Table 1 summarizes the NRA for all of the commodities while Figure 2 shows the NRA by trade status. Trends were roughly similar for all of the commodities. In particular, all of the crops were penalized substantially in the early part of the study period, and this reversed in the mid-1980s. This is consistent with the earlier study by Dethier (1991) who recorded negative rates of direct and exchange rate assistance on the order of -30 percent to -40 percent for wheat and maize from 1964 to 1985, and -60 percent or more for rice and cotton. Dethier reports only modestly negative to no assistance for sugar cane when the calculation is relevant using his methodology.

By about 1986, the NRAs turn positive, and then suddenly spike in the mid-1980s. This reflects the GOE attempt to reinvigorate agriculture and an overshooting as administered prices were adjusted substantially upwards, and tied to a lagging moving average, just as world prices fell dramatically in 1986. Indeed, 1986 was the last year of area restrictions, quotas and low fixed procurement prices for wheat and maize. Private sector imports were allowed in 1991-92. Cotton procurement prices were gradually increased from 1986 to 1991 to more closely reflect border prices, and were deregulated after that. Furthermore, the exchange rate regime was liberalized substantially in this period and the black market premium disappeared as rates were market determined.

Rice and sugar reflect trends similar to the other commodities, including the spike in the 1985-89 period, although neither product was deregulated until later. Sugar production was never fully deregulated and remains a government enterprise at the milling level, while rice was not really liberalized until 1991.

Table 1 also reports NRAs milk and beef, neither of which is much traded although we still categorize them as importable. Livestock was largely unregulated but beef production was protected with a 100 percent import tariff, and very restrictive health standards applied to imports for some years. Our calculations suggest that both products follow the NRA patterns of the five crops, although beef in particular seems to have

experienced few disincentives since the early 1970s. This is consistent with the trends reported in the 1970s and 1980s as livestock expanded fairly steadily until feed – maize and berseem – became an input constraint. Note that while the mean NRA has approached zero, the standard deviation of NRAs has increased over time (bottom of Table 1). Consequently the welfare cost of agricultural programs may have remained high, possibly may even have risen, because of the intra-sectoral variance in covered NRAs.

Since it is mostly trade measures that generate the NRAs, the distortions of the consumer side of the market are similar. This can be seen from the estimates of the average consumer tax equivalent (CTE) across covered products, shown near the bottom of Table 1. Wheat flour receives a very heavy consumer subsidy in addition, with its price being as low as one-fifth the border price in the 1960s (final row of Table 1).

We assume non-covered farm products face no distortions to their prices, since they are mostly horticultural products that are not subjected to government policy interventions. Including them therefore reduces the overall average NRA for the agricultural sector, as shown in the top rows of Table 2. We have no estimates of assistance that is not product specific.

Relative rate of assistance

The Relative Rate of Assistance (RRA) seeks to take into account the effects on farmer incentives of policy induced price changes in non-agricultural sectors. It does so by comparing the NRAs for just the tradable parts of agricultural and non-agricultural sectors. The NRA for the non-agricultural sector is assumed to be just the average import tariff equivalent throughout the period (so ignoring nontariff barriers for which we have no estimated NRAs). All manufactures are assumed to be import competing and “other primary exports” are assumed to represent non-farm exportables. For early missing data years we simply assumed that nothing had changed from the closest available year, which was 1960. These calculations suggest nominal non-agricultural (weighted) assistance averaged in the 30-45 percent range up to the mid-1970s and thereafter has been close to 25 percent except for a couple of outlier years. Consequently, since the non-agricultural

sector was favored by import protection and an overvalued exchange rate over the study period, the RRA estimates are considerably below the NRA estimates for agricultural tradables (Table 2). And they have been positive only in the latter 1980s (Figure 3). For the latest period, 2000-05, the estimates suggest the producer price for farmers relative to prices received by producers of non-agricultural tradables are about one-quarter below what they would be under free-market conditions. The bottom two rows of Table 2 show what those indicators would be if the exchange rate distortions had not been included in our analysis. In that case both the NRA for the agricultural sector and the RRA would have been slightly less negative prior to the 1980s.

One picture that emerges is that, while agriculture was repressed until about the mid-1980s, the degree of negative bias appears to have lightened or even reversed since that time. Typically, import-competing industries fare better than exportables. This is consistent with other studies such as Fletcher (1996), Ender and Holtzman (2003) and Bautista, Robinson et al. (1998), who find that whatever biases against primary agriculture existed earlier, these biases seem to have largely disappeared after the mid-1980s. The similarities between the NRA and RRA calculations suggest that the trends owe more to reversal of low procurement prices and exchange rate misalignment than to the import substitution policies favoring non-primary agriculture and manufacturing.

In calculating the experience of each product using the Methodology of the project we have assumed that one-half of foreign exchange was converted at the parallel rate when the official rate seemed overvalued. This is consistent with Al-Sayyid (2003), who reports a flourishing “gray market” during the period of the 1960s and 1970s when the exchange rate premiums were most pronounced. We use the black market premiums as reported in Cowitt (various years) to calculate the parallel exchange rates. The impact those exchange rate distortions have on the NRA and RRA estimates is relatively minor except in the 1960s, as shown in the bottom of Table 2.

Evolution of specific policy choices and their impacts

In this section, we focus on the policy choices of the GOE, especially with respect to agriculture and food policy, but mindful that certain industrial and exchange rate policies had profound indirect effects on agriculture. The main indirect policy effects were engendered by trade protection and direct subsidies to non-agricultural industries, especially heavier manufacturing industries, and by an overvalued exchange rate. By the 1990s, high and escalating tariffs along with some non-tariff barriers (e.g. "standards") for manufacturing were the main remaining indirect disincentives to agriculture.

As recounted earlier, while widespread planning characterized much of the economy from about 1956 until the mid-1980s, the retreat from markets was operationally less pronounced in agriculture until the 1960s. But by 1964, central planning, mandatory cooperative membership, and administered prices for the major crops were in place. Consequently, we focus here on developments during a period of regulation, 1964-1986, although briefly as they are surveyed extensively in Dethier (1991), and on the subsequent period of deregulation, 1987-2005, characterized by a turn back toward market incentives. We begin with an overview, and then turn to some product-specific issues, food subsidies, and rural income. We relate our narrative to the measures of distortions presented in Tables 1 and 2 and Figures 2 and 3.

Overview

The period 1964 to 1986

The policy objectives early on were aimed to promote the equitable distribution of food and income in Egypt, and to finance industrial growth through the provision of inexpensive food to urban consumers. The context was a vision of a grand coalition between the factory worker and the rural peasantry. Also, "Arab socialism" and a widespread distrust of markets, rooted in the 1952 Revolution and Suez Crisis of 1956, had become pervasive.

In order to achieve these objectives, the core of agricultural policy involved imposed crop rotation schedules and crop area allocations, a compulsory delivery quota for crops at fixed prices that were substantially lower than international prices, and subsidized consumer prices for basic food commodities. As we report below, while

setting prices and quantities (acreages) independently need not necessarily be inconsistent with one another, nonetheless as implemented they were as it turned out.

Institutionally, agricultural cooperatives were created in each village to control production and marketing of major crops. Cooperatives, in turn, provided agricultural inputs to farmers, imposed crop rotation schedules, procured the crop quotas, and ultimately marketed the major crops. The Principal Bank for Development and Agricultural Credit (PBDAC) was reconstituted to work along with the cooperatives in providing credit to farmers and receiving their output quotas.

In effect, and mixed with substantial planning in the non-agricultural sector along with an overvalued exchange rate aimed to conserve on foreign exchange resources, the policy performed poorly. The government intervention in production and marketing created many inefficiencies and distorted choices among competing crops.[3] The overvalued exchange rate and artificially low producer prices eventually suppressed agricultural production and led to stagnation of the agricultural sector. The extent of the disincentives to agriculture is clear in Table 1: for the five crops studied and milk, the NRA is almost uniformly and substantially negative throughout the period. Beef appears to have been mildly favored in this era.

These disincentives to farm production ultimately frustrated the original policy objectives. Yields fell, cropping patterns were distorted, and cotton exports declined. The food gap widened by the mid-1980s, despite some initial closing, and "self-sufficiency" in wheat declined to its lowest level as imports rose. The food subsidy system imposed a heavy burden on the budget and foreign exchange reserves, thus frustrating plans to support industrialization and conserve foreign currency. Furthermore, instead of achieving "a more equitable distribution of income," farm incomes declined initially due to the heavy implicit taxation reflected in artificially low producer prices, exacerbating the urban rural income gap. However, as rural incomes declined, the political hostility of the rural classes toward the government increased. That elicited the political response not of reduced government intervention but rather of increased farm input subsidies and an

[3] Hansen and Nashashibi (1975) observe that planning *per se* need not distort acreage choices of farmers nor necessarily lead to suboptimal cropping patterns, but it did, according to their methodology.

extension of food subsidies to rural areas in the late 1970s (Dethier 1991). Also, land ownership was arguably redistributed more equitably through land reform laws.

The period 1987 to 2005

Ostensibly, the policy objectives of this subsequent period were very similar to the previous period, but with the addition of redressing the budgetary and foreign exchange pressures created by the earlier policy. Specifically, the Agricultural Reform Program (ARP) of this era aimed to provide an adequate supply of food to all income groups, to promote greater self-sufficiency in crop production, to increase farm income, to conserve foreign exchange, and to bring the budget deficit under control (Kherallah 2000).

In fact, the policy pursued was essentially one of dismantling central planning and restoring market incentives. As recounted above, the planning approach was failing and had become a political liability. The policy measures implemented under the ARP consisted of two phases. In the first phase, prices, quotas, some crop restrictions, and marketing controls were partially liberalized for ten crops. The compulsory delivery program was eliminated for all crops and replaced with an optional program for a number of crops – namely, wheat, maize, and rice. Moreover, the procurement prices were replaced by floor prices, often tied to a moving average of lagging prices. It is this last feature that accounts for the positive NRA spikes 1986-87 in Figure 2 as floor prices were set generously just as world prices were falling. The volatility in the NRA caused by domestic prices being anchored to an average of lagging prices is consistent with the finding by Baffes and Gardner (2003) that world price fluctuations over time were only incompletely transmitted to domestic markets in Egypt.[4]

The second phase of the reform coincided with the launching of the Economic Reform and Structural Adjustment Program (ERSAP) in 1991. With the assistance of the International Monetary Fund (IMF) and World Bank, this program sought to shift Egypt from a state-controlled economy toward a more efficient, market-oriented economy. In this phase, cotton marketing was liberalized and all remaining input subsidies were

[4] There is also an aberration in our exchange rate series owing to a black market rate outlier in 1985. We have experimented with smoothing out this aberration and found that it is of little consequence to the NRA spike observed around this time. Price trends are the drivers.

eliminated. Also, the private sector was encouraged to play a greater role in agricultural trading. By 1997, the land rental relationship was liberalized as well.

Our measures of NRA and RRA indicate a policy impact as the direct disincentives to agriculture seem to have been reduced or eliminated, although as noted earlier the welfare implications are less clear as the variance of the NRA has increased. Protection for non-agricultural industry and processed foods remains, but is not large when weighted by production. Also, in terms of production response, yields generally rose and cropping patterns were rationalized (Saad et al. 1996, Ender and Holtzman 2003). On the other hand, while farm-gate prices have risen, the enactment of a market oriented land policy has resulted in some tenants who previously benefited from controlled, artificially low, land values becoming landless.

Crop-specific and other farm policies

Cotton

For over a century, cotton has been an important traditional crop, dominating area planted, value of production, importance to downstream industry, and exports. The sector was nationalized in the 1960s, and low administered procurement prices, along with many other interventions, were used to divert revenues to the GOE. This policy is clearly reflected in the large negative NRA estimates for cotton (Table 1), particularly before 1987, although the cotton sector was again taxed heavily in the early 1990s (Saad et al. 1996).

In consequence, total area planted in cotton declined by about half from 1980 to 2000. This contraction due to low profitability was exacerbated by rising wages in the 1970s and 1980s, since cotton is one of the most labor intensive of the major crops.[5] The land was instead planted with cereals, especially wheat and rice. This is consistent with our estimates of the relative NRAs as both wheat and rice assistance turned from substantially negative to mildly positive after the mid-1980s (Table 1). Also, horticulture

[5] In an earlier period, cotton production area had been restricted to reduce the supply of Egyptian long-staple cotton on world markets which were dominated by Egypt's exports at that time (but this was not the case in the more recent times discussed above).

expanded somewhat and berseem became quite profitable as the livestock sector flourished (Figure 1).

Confronted with the demise of a profitable industry, the GOE reversed course in the 1990s. In1992 procurement prices were increased to 66 percent of a five-year moving average of world prices. This policy accounts for both the upward trend and the sharp swings in our NRA estimates after 1991 as world prices fluctuated yearly. In 1994 administered prices were changed to floor prices, although the GOE did limit exports in 1995 to satisfy the needs of local mills, and in 1996 the floor prices actually exceeded the border prices.

In 1997 prices became market determined and the sector was essentially completely liberalized. Nonetheless, the NRA for cotton remained negative and, until quite recently, substantially so. The negative NRA reflects domestic prices which, although rising, still lagged border prices as the Egyptian pound depreciated sharply against the US dollar from 2.156 in 1991 to 3.41 in 1997 and 6.15 in 2004. Apparently the exchange rate changes are reflected more slowly in prices closer to the farm or, possibly, captured somewhere in shipping and processing along the value chain between farm and port.

Rice

Rice, along with cotton, is still exported. Since the 1960s the GOE has intervened actively in the rice supply chain with low administered prices, government procurement, an export monopoly, and extensive public sector mills. In the 1960s and 1970s, while both processed and primary production confronted disincentives, paddy rice was more penalized and this allowed the mills, and traders, to garner profits somewhat at the expense of the farmer. Our calculations show that this relative disadvantage disappeared in the 1980s. In any case, the relative price advantage of rice over more-penalized cotton, and perhaps the relatively higher subsidy value of the free water policy to a water-intensive crop, resulted in continued expansion of rice acreage as cotton contracted. Also, rice expansion has been further encouraged by incentives to wheat since the two crops are complementary in the crop rotation.

In the 1990s, rice production was substantially liberalized and crop area, yield, and production grew by 4-5 percent. Nominal prices to farmers doubled, and paddy rice actually received positive to only mildly negative assistance. Rice farm prices rose so much at one point that milling and exporting became unprofitable and the GOE enacted export subsidies of LE 100 - 200 to aid the (mostly government owned) milling sector. As with cotton, the negative NRAs since the early 1990s reflect rising domestic prices that nonetheless lag behind border prices which were rising rapidly in domestic currency terms due to the sharp currency depreciation.

It has been noted by a number of commentators that GOE rice policy is often in conflict with itself. Crop choice has been liberalized, yet rice growing area is still restricted. Similarly, while area is restricted in order to conserve on water usage, exports are periodically subsidized.

Maize

Maize, an import-competing industry, competes for area with rice and cotton, as well as some other summer crops. From the 1960s maize was regulated through mandatory cropping, delivery quotas, and administered prices. This resulted in very negative NRA throughout the 1960s and much of the 1970s. Low prices for yellow maize were passed on as feed subsidies until 1987,[6] when the sector was liberalized and procurement prices were raised to encourage production, consistent with the GOE renewed interest in food self-sufficiency and the growth of the livestock industry. The production area has expanded largely by displacing cotton and in the present decade has represented about 15 percent of the cropping area.

Politically, maize policy has become more entwined with food policy. Foremost, yellow maize is an important input into the expanding livestock sector which in turn is stimulated by the growing Egyptian demand for red meat. Also, in an effort to reduce wheat imports, which have risen to produce subsidized baladi bread, the GOE has experimented with substituting maize flour for wheat flour. Since maize flour is cheaper,

[6] Also, until 1965, prices and regulations were undoubtedly influenced by the US PL480 program which offered subsidized corn and wheat import credits to Egypt.

the cost of producing bread is thereby reduced and, along with it, the government cost of the bread subsidy.

Sugar

Sugar processing is directed by a government owned company, the Egyptian Sugar and Refining Company. Prices are administered, and procurement is handled through contracts between producers and the government company. Sugar consumption, which for a long time has been a part of the food subsidy policy, is still partially subsidized through price-discounted ration cards distributed to nearly two-thirds of the population. Because of the consumer subsidies, providing higher prices to growers has a negative impact on the government budget. Also, inefficiencies in milling, and so higher costs, make it difficult for the government to raise the farmgate prices of sugar cane and beet (the latter representing about one-quarter of sugar production). Nonetheless, we calculate that after the late 1970s the NRA for sugar turns positive, corroborating the estimates in Dethier (1991).

Wheat

Wheat is the primary input into the most important staple food in Egypt, bread, which is consumed in enormous quantities, heavily subsidized, and at the heart of a politically charged food subsidy policy. Prior to 1955, the GOE slowly began to tighten its control over the production and trading of wheat. The explicit objective was equitable distribution of food and income, and the provision of inexpensive food for urban consumers aimed to finance industrial growth (Kherallah 2004). In 1955, the GOE reduced the area allocation requirement for wheat production to 33 percent of agricultural land holdings, and at the same time initiated a compulsory delivery policy whereby each farmer had to sell a specific quota of wheat – between 1 and 3 ardeb per feddan – at a fixed price that was lower than the international price. By the 1960s wheat, along with the other cereals, was subjected to mandatory delivery quotas, low administered prices, and other marketing regulations. As Table 1 shows, the NRA for wheat was substantially negative until about 1987, although it increased in the late 1970s which reflects the replacement of the compulsory delivery requirement with an optional delivery program in

1976.[7] In 1960, Egypt began to import wheat for the first time in its history, and has imported it ever since. Before 1965, imports were further encouraged by US PL480, which made available credit subsidies for wheat imports from the United States.

During the reform period, after 1987, the GOE offered floor prices announced at planting time which were set to approximate or exceed international prices. For example, in 2005 the procurement price for wheat from farmers, at LE 1165, was about 11 percent higher than the price of French wheat adjusted for shipping costs. Since the GOE procured 2 million tons locally at this price, this represents support payments on the order of LE 220 million, or about 3 percent of the total value of wheat production. As with the other cereals, there was some overshooting in the late 1980s as floor prices exceeded international prices, but the NRA generally turned neutral to positive after that. Wheat production expanded and yields rose as well. Nonetheless, since the early 1980s, the self-sufficiency ratio has never been above 55 percent of total consumption, making Egypt one of the top four wheat importers in the world.

Livestock

Egypt has a significant stock of animals yielding meat and milk. (Buffalo are also a source of power on the farm.) Since there is little permanent pastureland, animals feed on berseem, corn, barley and wheat, thus competing with human consumption. The livestock population grew steadily after 1952, stimulated by a NRA of 100 percent and rising demand, and stabilized during the 1980s as feed became less available. Water buffalo is the primary source of milk on farms, supplemented by a commercial dairy herd of mainly Holstein cattle. In addition to buffalo and cattle, farmers raise poultry, sheep and, in diminishing quantities, camels. Pigs are less important since pork is not widely consumed, for religious reasons.

Input policies

Prior to the reform era of the mid-1980s, the GOE through the PBDAC monopolized farm inputs and distributed many inputs from seed to fertilizer administratively, including rationing based on technical information from the Ministry of Agriculture and Land

[7] Compulsory delivery was reinstated for two years in 1985 and 1986.

Reclamation, and at subsidized prices. The subsidies fell mainly on chemical fertilizers, pesticides, seeds, and animal feed. Under the ERSAP reform package, the monopoly was eliminated and private investment was allowed to compete with the PBDAC, although there was a two-year reversion to the old system for fertilizer during the 1995 "fertilizer crisis." Today, private firms dominate the fertilizer industry, for example, accounting for 75 percent of nitrogen fertilizer and all of phosphorus chemical fertilizer (Saad 2003). The private sector was also allowed to import, export, and distribute farm inputs. Pesticides are still controlled by the GOE for cotton, however. Between 1990 and 1997, virtually all of the input subsidies were eliminated and input prices now approximate international prices. Import taxes on fertilizer, prominent in the 1970s to protect some domestic producers, do not exceed 2 percent now.[8]

The Nile River almost defines Egypt, and water policy is viewed as critical. There have long been common elements to the policy which have not changed over the study period, or for that matter many centuries, and are commonly viewed as the purview of government. These include minimizing water loss (modern irrigation methods, improved navigational paths, new approaches to canal maintenance and weed control, efficient use of ground water, water recovery, and so on) and various programs for cost sharing (currently through Water Users' Associations which are locally based). Also, of course, the Aswan High Dam came on line during the study period. In effect, the marginal cost of water to farmers is zero. This has resulted in expansion of water-intensive crops – rice, bananas and sugar cane – relative to what otherwise might have been. This might help explain how rice can remain a viable farm industry despite the negative NRA shown in Table 1. Note, however, that any water subsidy works to the relative disadvantage of cotton in choosing acreage allotment (Hansen and Nashashibi 1975).

Land policy has evolved from an initially highly political issue that is integrally related to rural incomes. In 1952, the GOE announced that land reform would be a centerpiece of rural income equity policy. Over the ensuing years, land ownership was limited to 50 feddans, and about 12 percent of cultivated area was distributed to 341,000 families which were previously tenants. Over the years the number of small holders owning five feddans or fewer has increased substantially, suggesting continued land

[8] www.customs.gov.eg/customs_tariff/customtable_tariff.html

fragmentation. By the end of the 1990s, the average size of a holding was less than two feddans. In 1990, about two-thirds of the total land area was owned and cultivated by landlords (with family and/or hired workers) and only about 10 percent was rented for cash or sharecropped (Siam 2006).

Food consumer policy

It is impossible to divorce agricultural reform in Egypt from food policy, or food policy from real incomes. Historically, food consumer subsidies and food security have been pursued in Egypt for over ten centuries, and state granaries have existed since Pharaonic times (Scobie 1981). There is a very deeply ingrained mindset in the general population that government is mandated to ensure affordable food and, since the Nasser era, the state has explicitly pursued that mandate (Khouri-Dager 1996). Indeed, Singerman (1995) argues that the government policy of political exclusion has paralleled its commitment to provide the basic needs of the population, thereby maintaining its legitimacy. Thus, food consumer subsidies, especially for baladi bread and flour, are viewed as central to political stability, and the food riots of 1977, after staples prices were increased, still serves as a reminder for caution in policy reform. However, as is recognized by the GOE, a policy aimed to simultaneously subsidize food consumption, raise farm-gate prices to encourage production and reduce imports, and still maintain a credible budget balance to pursue other development goals, is inherently inconsistent.

Specifically, while rationing and subsidies for sugar, edible oil, sometimes wheat, and some other products were in place before 1952, after the Revolution, and particularly in the 1960s and 1970s, the program expanded greatly to encompass 18 foods including beans, lentils, frozen fish, red meat, chicken, rice and yellow maize. There was some rationing, but baladi bread, in particular, was not rationed and was heavily subsidized to the general public through the mechanism of subsidizing the wheat input to the bakeries. As self-sufficiency in wheat became elusive, and after 1960 as imports grew, this subsidy, along with the others, became a substantial drain on the budget.

After the 1976 attempt to cut subsidies generally met with violent public resistance, a more gradual approach was invoked. The number of subsidized foods was

reduced, subsidy levels were decreased, and ration card distribution became stricter. Currently, sugar, edible oil, baladi bread and flour continue to be subsidized. Sugar and oil are rationed and arguably manageable. Bread, however, is still not rationed and it has been estimated that as much as 8 percent of the total available is used as livestock or poultry feed.

Since the 1980s, the subsidy benefits have been about equally distributed across the population. In this sense the food subsidy is not well targeted even though it may be perceived as one of the most effective means of alleviating poverty in Egypt. The bread subsidy has been cited as particularly effective in rural areas where it has helped 11 percent of the poor out of poverty, owing to the fact that bread is a basic source of nutrition for this group, accounting for 27 percent of their total caloric needs.[9] Nonetheless, the system remains blunt in its targeting, and expensive to operate. Leakages from the system into the black market are significant – 28 percent for flour, 20 percent for sugar, and 15 percent for cooking oil – and the costs of transferring LE 1 of income to the needy often costs the government more than three times that amount (Ahmed et al. 2001).

Bread policy presents a political economy dilemma for the GOE. Currently, for example, the GOE provides 6 million tons of wheat for bread made available on the street at 5 PT per loaf, which is just 30 percent of the true wheat input cost. One third of the wheat is procured from local production by the Ministry of Supply and Home Trade (MSHT), and the rest is imported by the General Authority for Supply Commodities (GASC). Since the imported wheat is bought at international prices, and with the recent depreciation of the pound, this along with price supports generates a subsidy cost on the order of LE 9 billion, or almost 2 percent of GDP.

The cost of the other food subsidies is less severe. Access to subsidized sugar and edible oil is rationed monthly, at half a kilogram and one kilogram, respectively. While some receive a full subsidy (green cards), others receive only a partial subsidy (red cards) or no subsidy at all. The coverage of ration cards has been reduced modestly from 79 percent of the population in 1994 to 63 percent in 2004, when about 40 million individuals were covered by the green cards and about 6 million by the red cards. Table 3

[9] For the urban poor of Cairo the comparable number is 39 percent (Ahmed and Bouis 2003].

reports on total food subsidies in recent years, where the dominance of the bread subsidy is clear.

Impact on rural incomes

The agricultural reforms undertaken in Egypt over the last two decades have been broad and deep. Essentially, the agricultural sector has been converted from an almost totally centrally planned economy to a fairly wide-open free market economy. Since the earlier administration model entailed using agriculture as a source of forced savings to subsidize the urban consumer and industrialization, this reform should have resulted in increased rural prosperity as farm-gate prices were allowed to rise.

However, the link between rural incomes and reform is not straight-forward. Rural income is generated from owner-worked farms, hired labor, tenant farmers, and non-farm wages. Currently in rural Egypt, wage employment makes up the largest part of household income, about 43 percent, and explicit agricultural income constitutes about 29 percent. Of the remainder, transfers are the most important at 17 percent. The value added in primary agriculture depends on both primary goods output prices and on input prices, including especially land, water, fertilizer and pest control. Also, the cost of food is a very large component of real income.

Relative to the pre-reform period 1980-86, Rady, Omran, and Sands (1996) calculate that the agricultural resource income available to labor and other inputs from eleven crops, including the five crops of focus here, rose by 22 percent in the reform era of 1987-94. While the reduction of input subsidies hurt somewhat (income fell in 1991), the increases in efficiency, higher prices, and improved incentives allowed the same resources to generate over 20 percent more income. Rady, Omran, and Sands observe that "these are precisely the kinds of gains that justify the political risks that policy decision makers confronted when formulating the reforms."

The impact of reform on income distribution and poverty is more complicated. A number of studies have attempted to assess the issues using household-expenditure

survey data obtained from the Central Agency for Public Mobilization and Statistics (CAPMAS) and other data assembled by the International Food Policy Research Institute (IFPRI). Food, especially grains and high-carbohydrate items, dominate household expenditure in both rural and urban areas of Egypt, representing about 50 percent of expenditures on average and 70 percent for the poor. So the impact of more expensive food due either to higher farmgate prices or reduced food subsidies is potentially enormous. Datt and Olmstead (1998) infer that real wages declined substantially in response to food price increases, and imply that the increases in the prices of food crops in the context of ERSAP most probably has led to a decline in rural real incomes.

Siam (2005) reports a similar finding, noting that while the agricultural wage in money terms increased significantly in the 1990s, this was not reflected by living standards in the rural sector because the cost of living increased by more than the wage. According to El Helepy (2004), the ratio between the indices of agricultural wage and rural cost of living decreased from 1.1 in the periods 1974-81 (before reform) and 1982-1991 (during reform) to 0.7 in the period 1992-2002 (after reform). This may be explained substantially by the effect of the Economic Reform and Structural Adjustment Program (ERSAP) under which farm prices increased by more than agricultural wages, and noting that labor wages contribute a significant part of farm incomes, particularly for the majority of small farmers where it is as much as 70 percent. The ratio between the agricultural wage and non-agricultural wage decreased to 0.18 in 1992-2002, down from 0.26 in 1982-1991 and 0.29 in the pre-reform era of 1974-81 (El Helepy 2004). This may account for some of the labor migration out of agriculture. Also, land reform led to some poor households being pushed out of agriculture and into informal wage employment and the livestock rearing sector.

Comparing the pre-reform years 1981/82 with the post-reform years 1990/91, IFPRI (1994) concludes that poverty increased slightly in urban areas and may have increased in rural areas, depending on the particular income level used to measure poverty. If all food subsidies were to have been removed in 1990/91, the poor would have required income increases of 17 percent just to maintain the same welfare level. Since poverty is generally higher in some politically sensitive areas of the rural Delta, it is understandable that policy reform has been marked by cautious gradualism. Lofgren and

El-Said (1999) estimate that the benefits of eliminating the sugar and edible oil subsidies would be small while the negative impact would be quite regressive. Gutner (1999) has proposed more politically palatable targeted food subsidy reforms that would reduce access of the wealthy.

What about future policies?

From 2000 to 2003, real incomes in Egypt stagnated, unemployment rose and inflation approached 16 percent. In 2004, the pro-reform cabinet led by Prime Minister Ahmed Nazif was appointed, and reappointed in 2005, with a mandate to bolster private sector activity through policy reforms. Recently, import tariffs and income taxes have been reduced, and plans are in place to privatize most state enterprises and to restructure the financial sector. Feedback is positive as real GDP growth has increased, inflation has fallen, real interest rates are now positive, and investors have reappeared. Moreover, foreign exchange earnings are strong, led by the energy sector, tourism, Suez Canal revenues, and worker remittances.

These recent reforms and the programs announced, particularly the import tariff reductions and commitment to a flexible exchange rate, should work to reduce the remaining indirect disincentives to primary agricultural production. According to our NRA calculations, the remaining direct disincentives in farming are not large following the substantial reforms of the last decade. However, milk and the exportables, cotton and rice, continue to suffer negative assistance. And food subsidies, especially for bread and flour and their links to the fiscal budget deficit and poverty reduction, remain a policy dilemma.

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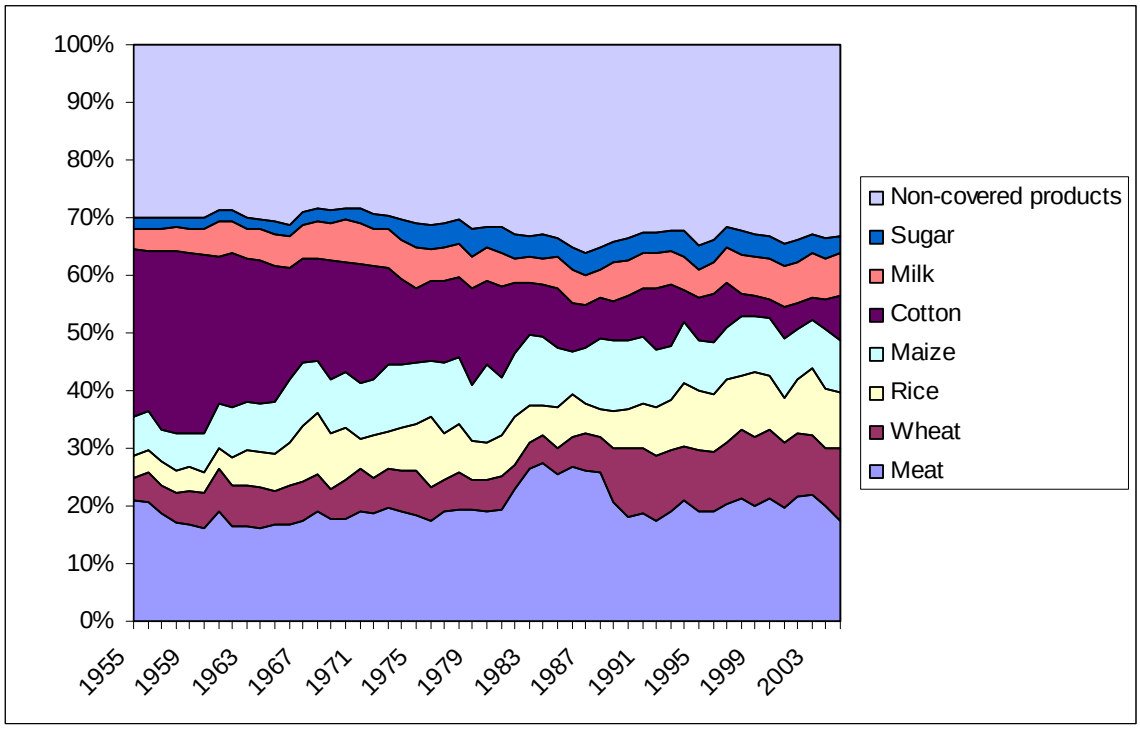
Figure 1: Product shares of agricultural output, Egypt, 1955 to 2005

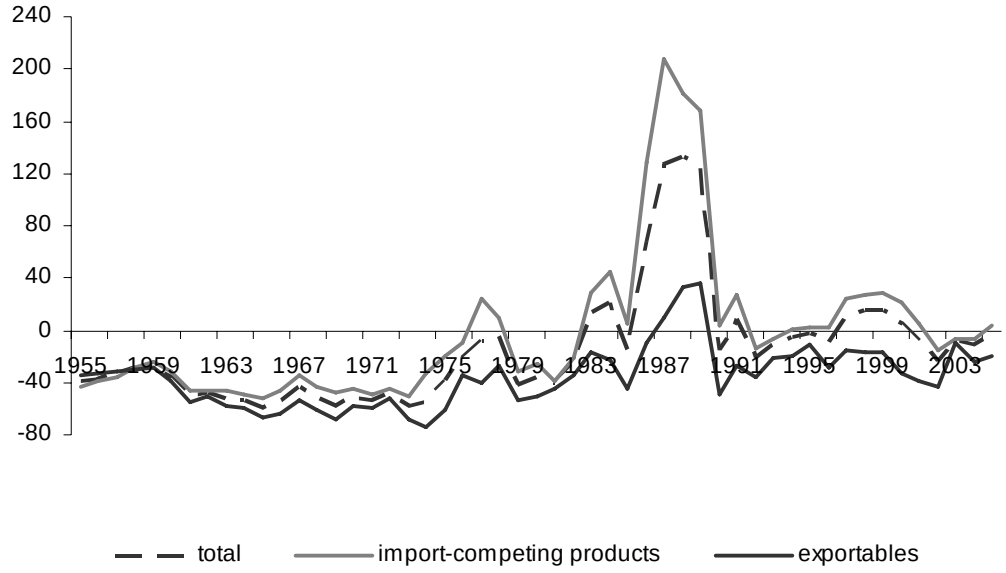
(percent, at current distorted prices)



Source: Authors' spreadsheet

Figure 2: Nominal rates of assistance to exportables, import-competing and all agricultural products, Egypt, 1955 to 2005

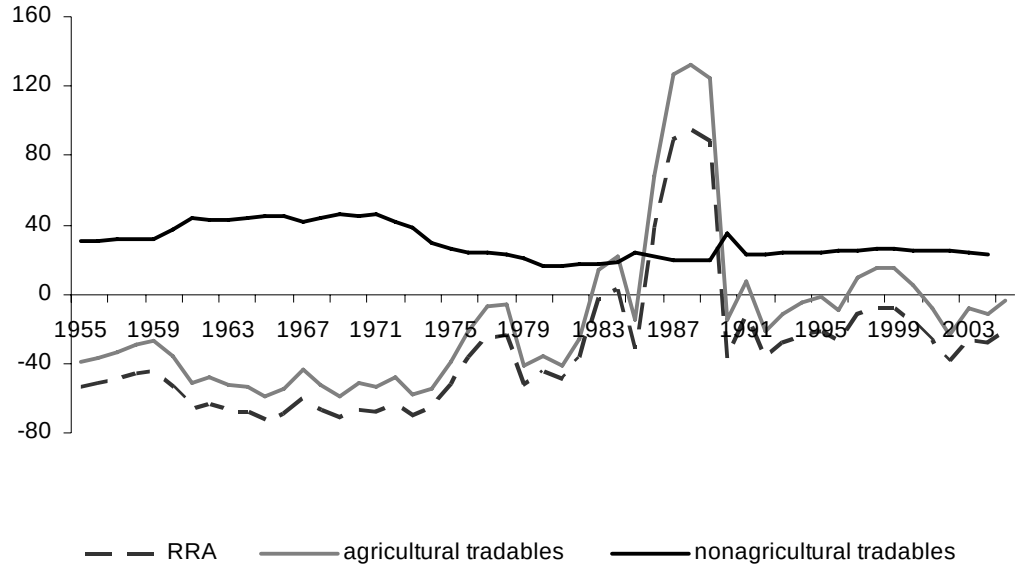
(percent)



Source: Authors' spreadsheet

Figure 3: Nominal rates of assistance to all nonagricultural tradables, all agricultural tradable industries, and relative rates of assistance[a], Egypt, 1955 to 2005

(percent)



[a] The RRA is defined as $100*[(100+NRAag^t)/(100+NRAnonag^t)-1]$, where $NRAag^t$ and $NRAnonag^t$ are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Source: Authors' spreadsheet

Table 1: Nominal rates of assistance and CTEs for covered farm products, Egypt, 1955 to 2005

(percent)

	1955-59	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-05
NRA, Exportables [a]	**-31.5**	**-52.4**	**-62.4**	**-62.2**	**-43.4**	**-34.0**	**5.0**	**-30.9**	**-17.8**	**-28.1**
Rice	-64.4	-62.4	-57.4	-48.5	-22.6	-19.6	52.4	-11.9	-18.2	-23.8
Cotton	-21.6	-50.0	-64.0	-64.9	-49.9	-38.7	-13.6	-40.2	-14.5	-34.1
NRA, Import-competing products[a]	**-34.3**	**-44.0**	**-44.6**	**-44.4**	**-5.5**	**-2.5**	**138.2**	**2.4**	**16.9**	**0.0**
Wheat	-40.8	-48.5	-34.2	-30.0	-12.7	-31.5	129.2	47.5	29.6	6.0
Maize	-32.1	-35.5	-31.8	-22.4	23.6	13.2	237.4	31.1	23.1	17.8
Sugar	-26.9	-52.8	-34.7	-59.3	-26.6	-8.9	81.6	-24.4	-5.4	7.2
Meat	-13.4	-32.6	-49.9	-48.0	12.3	26.5	156.2	-11.2	34.5	1.6
Milk	-68.1	-57.1	-50.6	-43.1	-28.8	-43.9	57.4	-15.6	-19.5	-19.3
NRA, Total of covered products[a]	**-33.1**	**-48.1**	**-53.6**	**-53.0**	**-23.2**	**-13.3**	**87.3**	**-9.1**	**5.9**	**-8.3**
Dispersion of covered product NRAs[b]	21.9	14.7	17.1	21.3	32.2	31.9	89.6	33.0	28.7	23.0
% coverage (at undistorted prices)	70	71	70	71	69	68	65	67	67	67
CTE, Total of covered products[c]	na	-51	-49	-50	-21	-13	108	-3	13	-2
of which wheat flour	-76	-79	-73	-72	-65	-72	-4	-36	-44	-56

a. Weighted averages, with weights based on the unassisted value of production.
b. Dispersion is a simple 5-year average of the annual standard deviation around the weighted mean of NRAs of covered products.
c. Weighted averages, with weights based on the unassisted value of consumption.
Source: Authors' spreadsheet

Table 2: Nominal rates of assistance to agricultural relative to nonagricultural industries, Egypt, 1955 to 2005
(percent)

	1955-59	**1960-64**	**1965-69**	**1970-74**	**1975-79**	**1980-84**	**1985-89**	**1990-94**	**1995-99**	**2000-05**
Covered products	-33.1	-48.1	-53.6	-53.0	-23.2	-13.3	87.3	-9.1	5.9	-8.3
Non-covered products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total agricultural NRA	-23.2	-33.9	-37.7	-37.5	-15.9	-9.2	56.6	-6.1	4.0	-5.5
Trade bias index[b]	0.05	-0.15	-0.32	-0.31	-0.39	-0.28	-0.55	-0.32	-0.29	-0.27
Assistance to just tradables:										
NRA, all agricultural tradables	-33.1	-48.1	-53.6	-53.0	-23.2	-13.3	87.3	-9.1	5.9	-8.3
NRA, all non-agricultural tradables	31.2	42.3	44.2	40.3	23.5	17.4	20.9	25.5	25.2	24.1
Relative rate of assistance, RRA[a]	-49.0	-63.4	-67.8	-66.5	-37.8	-26.3	55.6	-27.3	-15.5	-26.1
MEMO, ignoring exchange rate distortions:										
Total agricultural NRA	-21.7	-29.2	-32.3	-34.4	-15.7	-9.1	57.1	-5.3	4.0	-5.5
RRA (relative rate of assistance)[a]	-45.8	-53.9	-57.5	-59.5	-37.4	-26.2	55.9	-24.9	-15.3	-26.1

a. The RRA is defined as $100*[(100+NRAag^t)/(100+NRAnonag^t)-1]$, where $NRAag^t$ and $NRAnonag^t$ are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.
b. Trade bias index is $TBI = (1+NRAag_x/100)/(1+NRAag_m/100) - 1$, where $NRAag_m$ and $NRAag_x$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.

Source: Authors' spreadsheet

Table 3: Food consumer subsidy costs, Egypt, 1990 to 2005

(LE millions)

Year	Sugar	Oil	Baladi bread	Total
1990/91	500	368	1255	2123
1991/92	675	586	1057	2318
1992/93	597	500	1308	2405
1993/94	464	471	1424	2359
1994/95	464	473	1486	2423
1995/96	466	479	2185	3130
1996/97	635	520	2307	3462
1997/98	511	497	2380	3388
1998/99	530	400	2460	3390
1999/00	449	657	2561	3667
2000/01	523	798	2744	6465
2001/02	577	719	2950	4246
2002/03	546	614	3009	4169
2003/04	609	854	3201	4664
2004/05	634	1283	7123	8051
2005/06	609	1570	8442	10622

Source: Ministry of Supply and Home Trade

Appendix: Key quantity and price data, assumptions and sources

Quantities

Production and consumption data are from the Ministry of Agriculture and Land Reclamation (MALR) - Sector of Economic Affairs. Some of these data are shared with FAO. For import, exports, and change in stocks, 1955-59, we have used FAO data.

Prices

Cotton

We used MALR data and margins for both seed and lint. The lint price was on average 2.17 times above the wholesale price for seed and with a fairly low variance, although the margin ranged from 2.7 in the early years to 1.7 in the later years. This is roughly consistent with reported data for Zambia and a bit higher than for Tanzania. (Note that the conversion from seed to lint is about .33, although there are some bi-products such as cottonseed and oil which have value. Specifically, one seed cotton kentar produces 50 kg of cotton lint, 150 kg of cotton seed, 2 kg of scarto and 0.5 kg of dust. (1 kg = 2.2075 lb).) Our seed prices coincide with Dethier and the FAO where the series overlap. Our lint prices are consistently lower than the FAO producer price series, which averaged 2.9 times higher than the seed price versus our 2.17 average. The series tracked each other reasonably closely in terms of fluctuations in price, but in the later years our lint series is as much as 25 percent below the FAO lint series.

For border prices we used 1961-2005 FAO unit values which coincided with prices reported by MALR-Sector of Economic Affairs. For 1955-60 we used World Bank (AINDEX) w/ freight factors inferred as follows:[(FAO unit values 1961-63) minus (WB int'l prices)]/3.

Our prices for the early 1960s were close to those reported in Hansen and Nashashibi (1974) when adjusted for our exchange rate assumptions. This was also the case for rice, maize, wheat, and sugar.

Rice

We used MALR data and margins for both paddy rice and rice. The paddy price was very close to Dethier and to the FAO series where the series coincided. Our wholesale price is about in line with the .67 conversion rate of paddy to rice.

For the border prices we used 1961-2005 FAO unit values. For 1955-60 we used MALR series based on World Bank (Bangkok).

Maize and wheat

We used MALR-Sector of Economic Affairs data. Our prices tracked both Dethier's and the FAO producer prices closely, but ours were just a bit higher.

For border prices we used FAO 1961 on; for 1955-60 we inferred transport costs using WB and MALR data (EPP sheet) and later FAO-WB differences to calculate the freight factor.

Sugar

Our sugar cane prices and margins are from the MALR- Sector of Economic Affairs. These prices track closely but almost 30 percent higher the Dethier and FAO series, which coincide almost. We constructed the processed sugar prices from MALR- Sector of Economic Affairs. This series seems reasonable based on the 0.10 conversion of cane to sugar and using the FAO cane prices as a reference. Our cane prices seem a bit high relative to our sugar prices.

For border prices we used FAO unit values 1961-2005; 1955-60 was constructed from EPP-MALR-sector of economic affairs (attached here as sheet 1) using the 4 year average difference between FAO and WB series 1961-64 to infer transport margins for 1955-60. Data showed no imports for 1971 and 1973, so we extrapolated in between nearest years in the series (1970, 1972, 1974).

Milk

We took the farmgate price data (MALR-Sector of Economic Affairs) and added a 20 percent margin for the wholesale price. Our series is close to the FAO producer prices in the 1960s and 1970s, but diverges lower by almost 50 percent in the 1990s.

For border prices we used FAO unit values (milk equivalents), which were close to the New Zealand milk prices plus 25 percent used in the Ecuador spreadsheet. (Our prices were a bit higher.)

Meat

We used FAOSTAT producer prices for 1967-2003, with 2004-5 prices set at 2003 prices; for 1955-1966 we took .95 of each succeeding year. This series is close to the MALR series on producer prices and wholesale prices where MALR data is available (1991-2005 for one series or the other).

For border prices we used WB beef data (World Bank 2006) plus a 25 percent margin (following the Ecuador transport margin). For 1955-60 we used backward moving averages. This series of prices exceeded the FAO unit values for bovine meat imports, but imports were sporadic and the FAO series seemed unstable relative to the WB series and the Ecuador “dressed carcass weight price” series. We compared this series with a number of other series reported in the Spreadsheet.

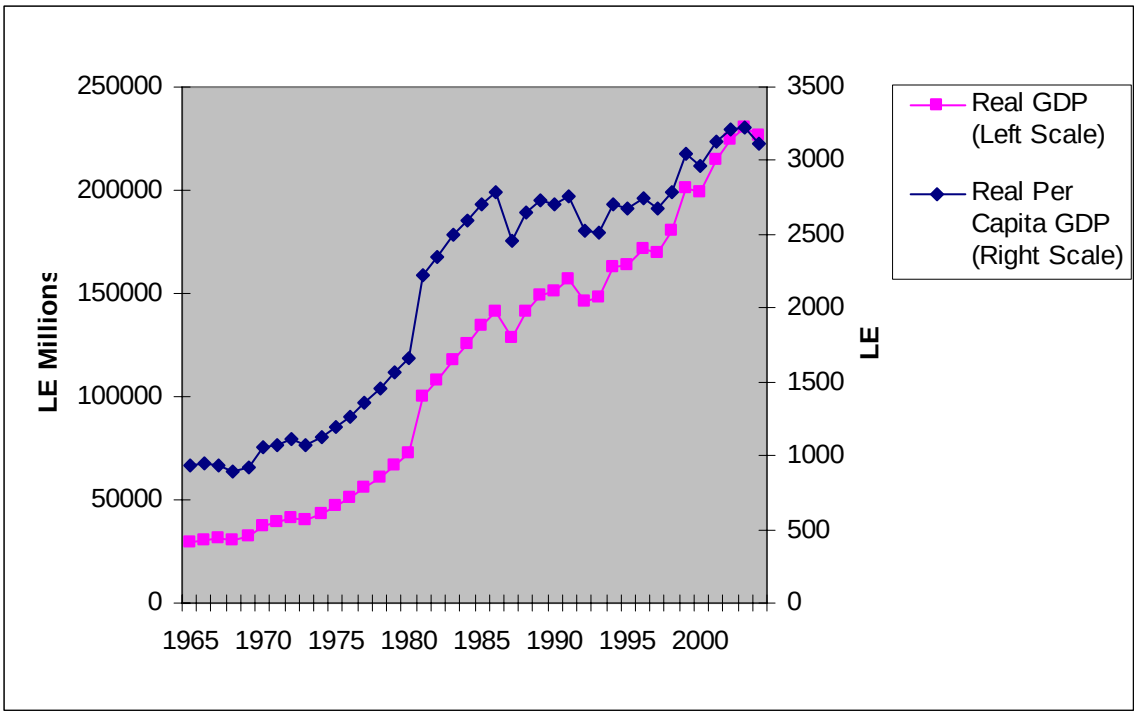
Exchange rates

Official exchange rates are from IMF (2006 and earlier years). Parallel exchange rates are assumed to be the black market rates in Easterly (2006). One concern was the outlier black market rate reported for 1985. (Pick’s reported a much more uniform rate for that year.) We tried smoothing out the 1985 outlier and it did not essentially change our calculations, so in the end we used the outlier since it was reported as part of the series and that was indeed a turbulent time for Egyptian foreign exchange markets.

Taxes and subsidies on production, consumption, input and trade

These are from MALR- Sector of Economic Affairs.

Appendix Figure 1: Real GDP (in 1992 prices), Egypt, 1965 to 2004

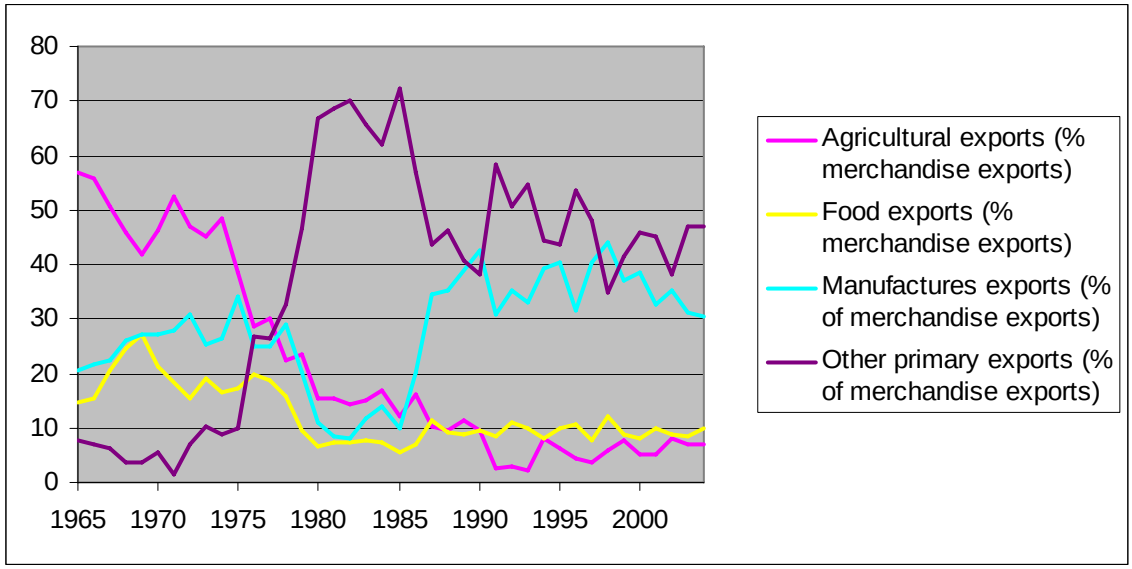


Source: World Bank (2006)

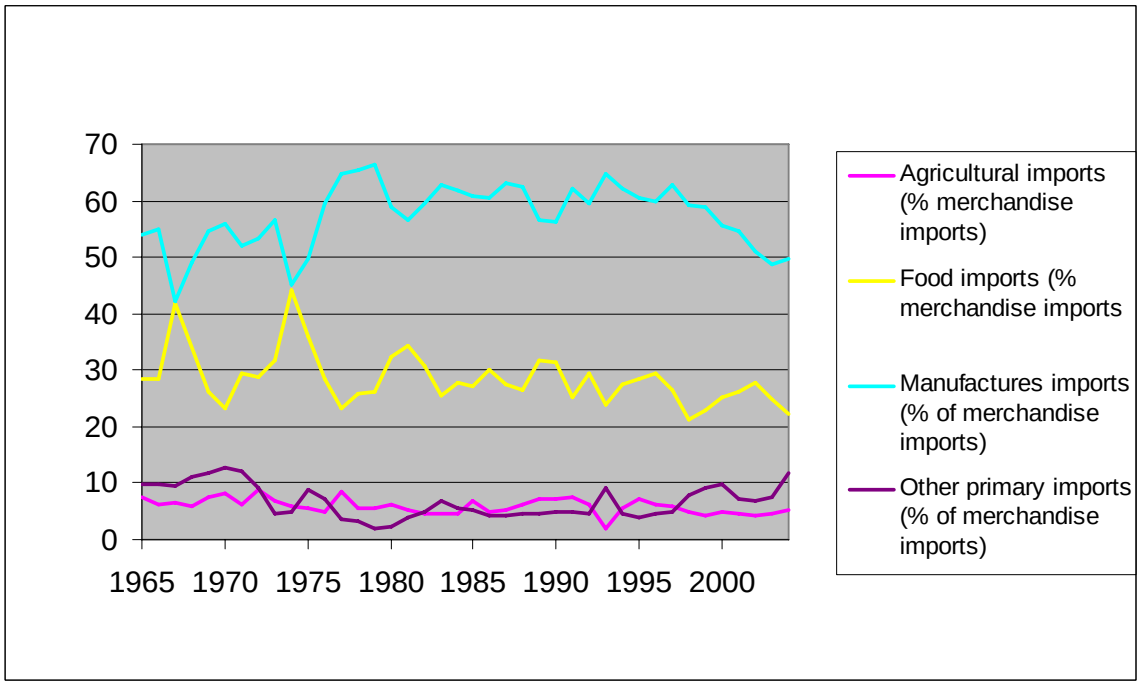
Appendix Figure 2: Composition of merchandise trade, Egypt, 1965 to 2004

(percent)

(a) Export shares



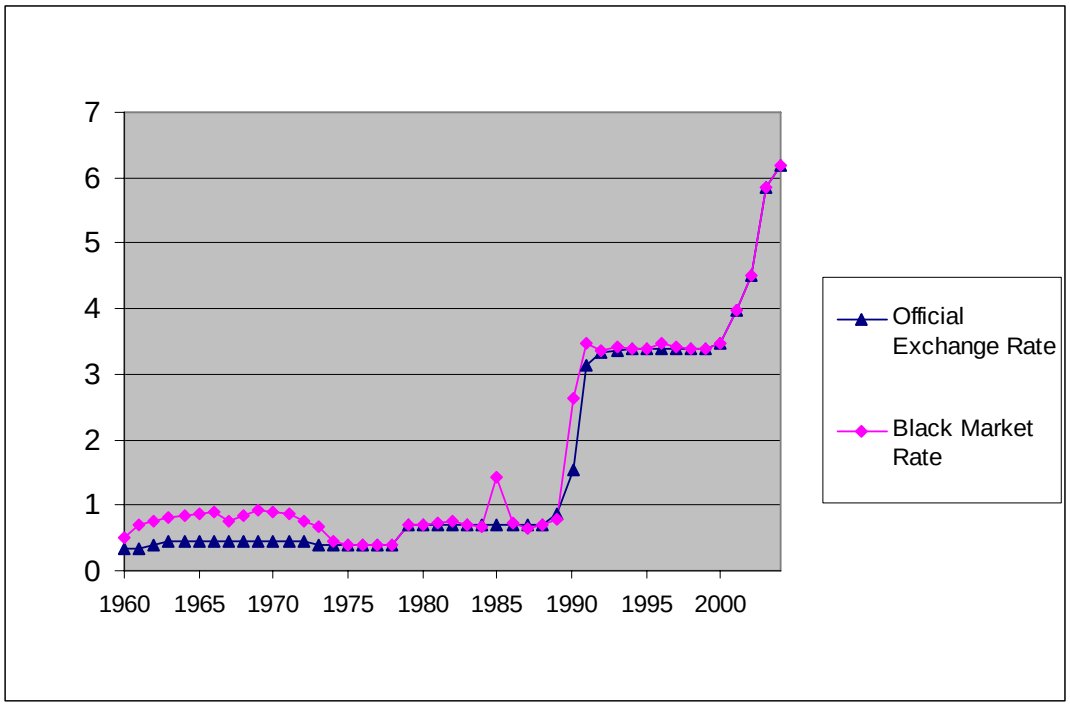
(b) Import shares



Source: World Bank (2006)

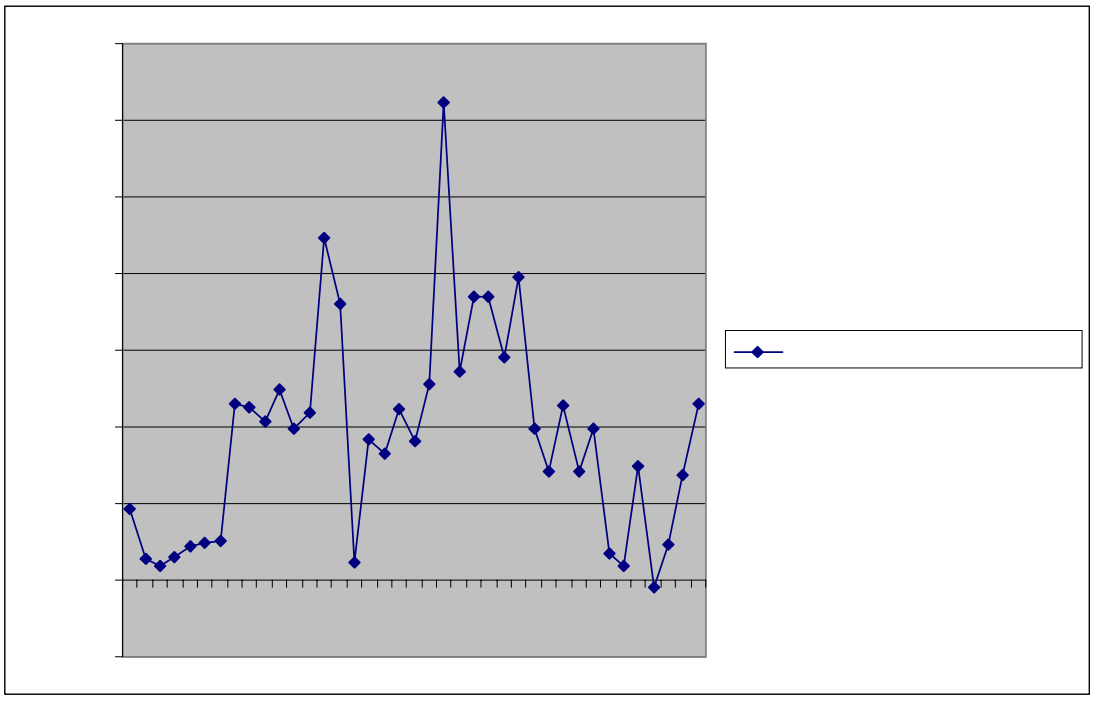
Appendix Figure 3: Currency exchange rate and inflation rate, Egypt, 1960 to 2004

(a) Exchange rate (LE/USD)



Source: IMF (2006) and Cowitt (various years)

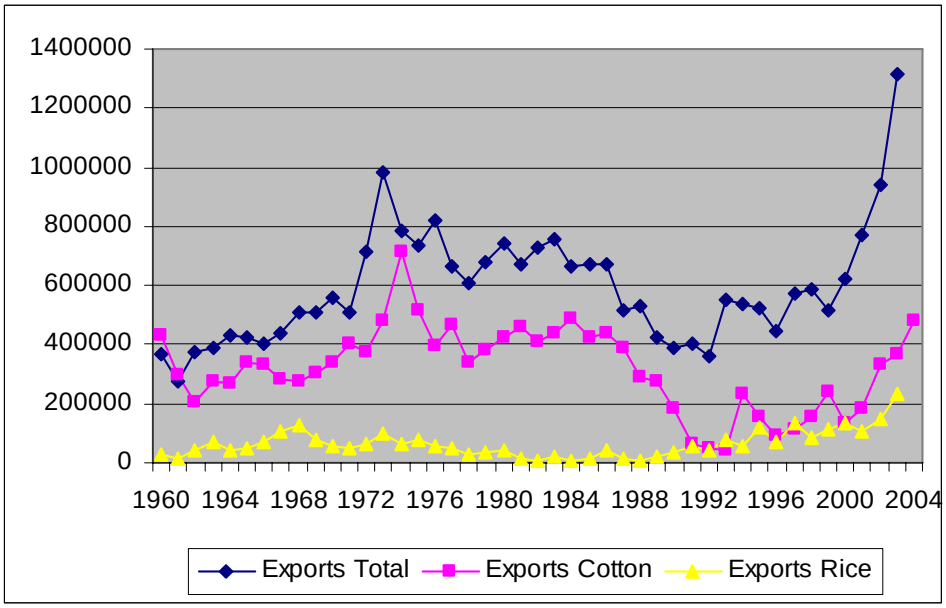
(b) Inflation rate (percent)



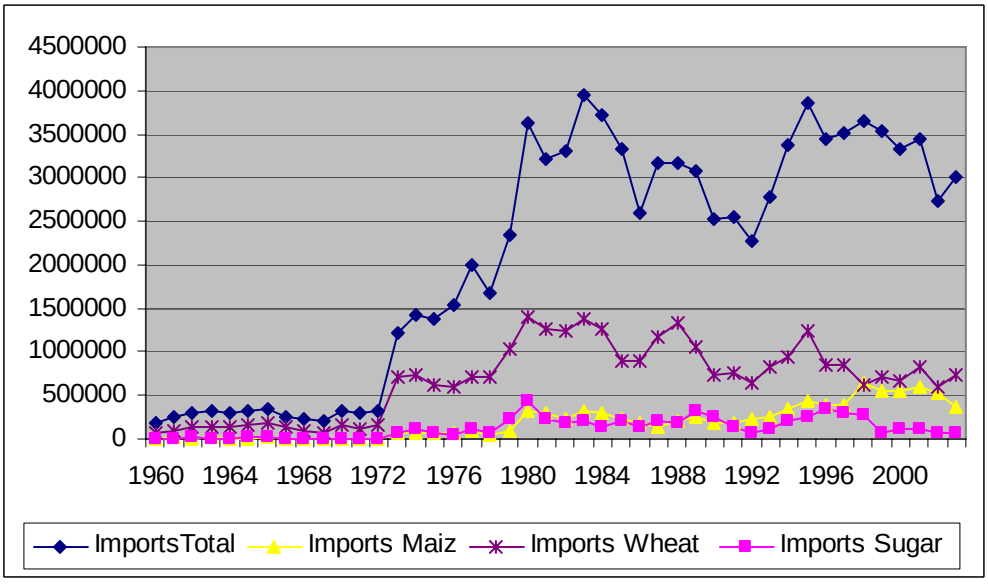
Appendix Figure 4: Agricultural trade by commodity, Egypt, 1960 to 2004

(USD '000)

(a) Exports



(b) Imports



Source: MALR

Appendix Table 1: Nominal and effective rates of protection, Egypt, 1997 and 1998 (percent)

Activity	NRPj		ERPj	
	1997	1998	1997	1998
Agriculture	**7.14**	**7.01**	**6.81**	**6.67**
1. Agricultural Food Products	6.82	6.44	6.62	6.20
2. Agricultural Non-Food Products	9.49	9.49	9.63	9.63
3. Livestock Products	5.11	5.11	4.17	4.17
Manufacturing	**27.37**	**25.42**	**34.22**	**31.53**
4. Food Processing	6.87	6.82	6.39	6.54
5. Beverages	271.64	263.03	-1781.70	-888.65
6. Tobacco Processing	85.00	85.00	88.47	88.90
7. Cotton Ginning	5.01	5.01	-10.89	-10.86
8. Spinning and Weaving	27.95	28.95	47.55	53.09
9. Final Wear	46.64	38.29	55.86	45.06
10. Leather & Leather Products (excl. Footwear)	31.13	28.49	47.57	43.44
11. Footwear	39.10	34.55	50.81	43.79
12. Wood & Wood Products (excl. Furniture)	8.64	8.61	6.10	6.26
13. Furniture	49.90	39.95	83.80	63.30
14. Paper and Printing	17.05	16.37	17.84	17.11
15. Chemicals (excl. Petroleum Refining)	10.01	9.98	9.20	9.25
16. Petroleum Refining	11.81	11.81	14.76	14.80
17. Rubber and Plastic Products	28.47	27.64	43.07	45.31
18. Porcelain, China and Ceramics	35.04	29.55	55.95	45.33
19. Glass Products	20.65	19.74	23.20	22.27
20. Non-Metallic Products	15.18	15.01	18.52	19.11
21. Steel, Iron and Metallic Products	16.06	15.78	18.06	17.97
22. Machinery and Equipment	15.30	14.29	14.49	13.14
23. Means of Transport	43.97	41.49	55.62	52.64
24. Other Manufacturing	18.14	17.47	18.52	17.49
Average	**24.62**	**22.91**	**30.48**	**28.14**
Standard Deviation	**19.51**	**18.24**	**26.93**	**24.31**

SOURCE: Maurice Thorne and Hanaa Kheir-el-Din (DEPRA/MOE)

Appendix Table 2: Prices and NRAs for primary products, Egypt, 1960 to 2005

	Maize			Wheat			Sugar		
	Domestic price per MT	Border price per MT	NRA = DP-BP / BP	Domestic price per MT	Border price per MT	NRA = DP-BP / BP	Domestic price per MT	Border price per MT	NRA = DP-BP / BP
1960	19	23	-0.19	20	33	-0.40	30	43	-0.30
1961	21	37	-0.42	22	40	-0.45	31	53	-0.42
1962	23	37	-0.37	24	52	-0.53	32	49	-0.35
1963	26	42	-0.38	27	55	-0.50	33	157	-0.79
1964	29	49	-0.40	30	66	-0.54	34	161	-0.79
1965	28	54	-0.47	31	57	-0.46	39	138	-0.71
1966	34	51	-0.34	34	56	-0.40	37	75	-0.51
1967	38	44	-0.13	38	50	-0.23	40	44	-0.11
1968	31	45	-0.32	33	48	-0.30	40	50	-0.21
1969	35	51	-0.33	34	50	-0.32	40	49	-0.19
1970	35	48	-0.26	40	45	-0.11	37	74	-0.50
1971	35	51	-0.31	37	55	-0.32	37	86	-0.57
1972	40	43	-0.08	37	49	-0.24	40	90	-0.56
1973	49	61	-0.19	40	62	-0.35	41	111	-0.63
1974	56	78	-0.28	49	95	-0.48	71	241	-0.71
1975	57	65	-0.13	54	80	-0.32	81	241	-0.66
1976	57	68	-0.15	50	64	-0.22	91	136	-0.33
1977	84	51	0.64	57	55	0.05	91	99	-0.08
1978	80	53	0.52	65	55	0.18	101	105	-0.04
1979	84	64	0.31	68	100	-0.32	136	173	-0.21
1980	134	122	0.10	92	136	-0.32	136	338	-0.60
1981	106	177	-0.40	97	180	-0.46	171	449	-0.62
1982	138	172	-0.20	87	181	-0.52	193	214	-0.10
1983	182	100	0.81	116	153	-0.24	213	166	0.28
1984	188	139	0.35	131	135	-0.03	253	160	0.59
1985	210	190	0.11	179	226	-0.21	253	239	0.06
1986	236	85	1.78	232	97	1.39	316	207	0.52
1987	273	56	3.86	232	75	2.07	351	130	1.70
1988	343	76	3.50	247	109	1.28	400	203	0.97
1989	425	117	2.62	450	153	1.93	511	280	0.82
1990	448	310	0.44	490	374	0.31	591	920	-0.36
1991	463	289	0.60	515	240	1.15	591	693	-0.15
1992	458	416	0.10	545	453	0.20	671	1038	-0.35
1993	482	382	0.26	548	420	0.31	741	937	-0.21
1994	504	441	0.14	553	393	0.41	821	971	-0.15
1995	540	488	0.11	581	587	-0.01	911	1262	-0.28
1996	564	608	-0.07	662	709	-0.07	961	1139	-0.16
1997	580	429	0.35	689	406	0.70	961	1176	-0.18
1998	608	433	0.40	707	510	0.39	961	871	0.10
1999	635	465	0.36	718	487	0.47	961	772	0.24
2000	638	445	0.43	725	565	0.28	961	603	0.59
2001	645	521	0.24	736	684	0.08	1061	801	0.33
2002	662	756	-0.12	754	884	-0.15	1061	1322	-0.20
2003	727	808	-0.10	796	927	-0.14	1061	1191	-0.11

2004	1071	923	0.16	1036	1025	0.01	1311	1263	0.04
2005	1072	733	0.46	1156	906	0.28	1311	1675	-0.22

	Cotton			Rice		
	Domestic price per MT	Border price per MT	NRA = DP-BP / BP	Domestic price per MT	Border price per MT	NRA = DP-BP / BP
1960	226	350	-0.35	23	50	-0.54
1961	221	494	-0.55	25	61	-0.58
1962	257	474	-0.46	28	81	-0.65
1963	240	545	-0.56	31	82	-0.62
1964	230	541	-0.58	35	95	-0.63
1965	203	621	-0.67	40	103	-0.61
1966	202	600	-0.66	49	109	-0.55
1967	231	517	-0.55	55	106	-0.48
1968	242	614	-0.61	56	130	-0.57
1969	222	758	-0.71	59	129	-0.54
1970	272	754	-0.64	56	93	-0.40
1971	270	735	-0.63	57	82	-0.30
1972	301	688	-0.56	59	74	-0.21
1973	266	883	-0.70	63	141	-0.55
1974	311	1083	-0.71	78	322	-0.76
1975	348	874	-0.60	87	228	-0.62
1976	450	757	-0.41	104	145	-0.29
1977	483	1025	-0.53	116	104	0.12
1978	500	808	-0.38	132	137	-0.04
1979	622	1473	-0.58	133	230	-0.42
1980	645	1460	-0.56	156	249	-0.37
1981	787	1498	-0.47	184	327	-0.44
1982	808	1212	-0.33	232	369	-0.37
1983	924	1168	-0.21	234	252	-0.07
1984	971	1519	-0.36	236	212	0.11
1985	1286	2972	-0.57	360	405	-0.11
1986	1369	1741	-0.21	414	282	0.47
1987	1660	1563	0.06	353	252	0.40
1988	2133	1992	0.07	430	168	1.56
1989	2917	3014	-0.03	591	198	1.99
1990	3595	8929	-0.60	453	557	-0.19
1991	4330	8060	-0.46	706	542	0.30
1992	4981	9132	-0.45	731	1011	-0.28
1993	4756	6478	-0.27	812	931	-0.13
1994	4305	5583	-0.23	966	1057	-0.09
1995	7458	6123	0.22	1048	1202	-0.13
1996	6917	10890	-0.36	1120	1215	-0.08
1997	7549	7190	0.05	1148	1176	-0.02
1998	4858	6470	-0.25	1160	1046	0.11
1999	3604	5817	-0.38	1175	952	0.23
2000	4133	6477	-0.36	959	1086	-0.12
2001	4097	8242	-0.50	979	904	0.08
2002	4864	9876	-0.51	1099	1344	-0.18

2003	8296	9205	-0.10	1581	1553	0.02
2004	8205	12924	-0.37	1633	1671	-0.02
2005	7813	9903	-0.21	1701	1978	-0.14

	Milk			Meat		
	Domestic price per MT	Border price per MT	NRA = DP-BP / BP	Domestic price per MT	Border price per MT	NRA = DP-BP / BP
1960	23	54	-0.57	349	434	-0.20
1961	26	96	-0.73	368	517	-0.29
1962	29	76	-0.63	387	637	-0.39
1963	32	70	-0.55	408	591	-0.31
1964	35	56	-0.37	429	771	-0.44
1965	36	98	-0.63	452	839	-0.46
1966	39	70	-0.44	475	1016	-0.53
1967	45	78	-0.42	500	892	-0.44
1968	39	87	-0.55	509	995	-0.49
1969	39	76	-0.48	520	1218	-0.57
1970	46	78	-0.40	534	1289	-0.59
1971	42	78	-0.45	531	1280	-0.59
1972	42	96	-0.56	588	1260	-0.53
1973	46	101	-0.55	664	1633	-0.59
1974	56	69	-0.19	784	872	-0.10
1975	62	73	-0.16	812	652	0.24
1976	57	78	-0.28	931	781	0.19
1977	65	82	-0.21	1092	745	0.47
1978	74	115	-0.36	1233	1067	0.15
1979	77	137	-0.44	1425	2549	-0.44
1980	106	161	-0.34	1791	2439	-0.27
1981	110	211	-0.48	1846	2250	-0.18
1982	98	276	-0.64	2500	2217	0.13
1983	132	238	-0.45	3500	2108	0.66
1984	149	208	-0.28	3833	1935	0.98
1985	206	369	-0.44	4500	3367	0.34
1986	270	225	0.20	5500	1880	1.93
1987	268	136	0.97	5933	1947	2.05
1988	285	141	1.02	6267	2182	1.87
1989	524	247	1.12	6763	2574	1.63
1990	568	601	-0.05	6853	7579	-0.10
1991	598	574	0.04	7425	7177	0.03
1992	632	888	-0.29	7583	10359	-0.27
1993	635	849	-0.25	9009	11181	-0.19
1994	640	825	-0.22	9497	9881	-0.04
1995	672	939	-0.28	10052	8081	0.24
1996	768	1040	-0.26	10393	7704	0.35
1997	797	969	-0.18	10583	7906	0.34
1998	816	964	-0.15	10380	7308	0.42
1999	826	915	-0.10	10760	7846	0.37
2000	831	956	-0.13	11110	9347	0.19

2001	841	1050	-0.20	12200	12031	0.01
2002	862	1305	-0.34	14318	15873	-0.10
2003	912	1212	-0.25	16485	15318	0.08
2004	1200	1492	-0.20	16485	19300	-0.15
2005	1344	1408	-0.05	16485	18973	-0.13

Source: Authors' spreadsheet using methodology from Anderson et al. (2008)

Appendix Table 3: Exchange rates per US dollar, Egypt, 1960 to 2005

	Official rate	Secondary/parallel market rate	Retention rate [a]	Estimated equilibrium exchange rate using this study's methodology [b]
1960	0.350	0.512	0.5	0.471
1961	0.350	0.692	0.5	0.606
1962	0.435	0.806	0.5	0.714
1963	0.435	0.800	0.5	0.709
1964	0.435	0.833	0.5	0.734
1965	0.435	0.870	0.5	0.761
1966	0.435	0.909	0.5	0.791
1967	0.435	0.769	0.5	0.686
1968	0.435	0.833	0.5	0.734
1969	0.435	0.917	0.5	0.797
1970	0.435	0.909	0.5	0.791
1971	0.435	0.870	0.5	0.761
1972	0.435	0.763	0.5	0.681
1973	0.435	0.721	0.5	0.650
1974	0.391	0.458	0.5	0.441
1975	0.391	0.394	0.5	0.393
1976	0.391	0.397	0.5	0.395
1977	0.391	0.397	0.5	0.396
1978	0.391	0.402	0.5	0.399
1979	0.700	0.709	0.5	0.707
1980	0.700	0.709	0.5	0.707
1981	0.700	0.737	0.5	0.728
1982	0.700	0.756	0.5	0.742
1983	0.700	0.688	0.5	0.691
1984	0.700	0.675	0.5	0.681
1985	0.700	1.434	0.5	1.250
1986	0.700	0.725	0.5	0.719
1987	0.700	0.637	0.5	0.653
1988	0.700	0.691	0.5	0.693
1989	0.867	0.780	0.5	0.802
1990	1.550	2.637	0.5	2.365
1991	2.000	2.208	0.5	2.156
1992	3.339	3.389	0.5	3.376
1993	3.372	3.432	0.5	3.417
1994	3.391	3.391	0.5	3.391
1995	3.390	3.390	0.5	3.390
1996	3.388	3.474	0.5	3.452
1997	3.388	3.414	0.5	3.408
1998	3.388	3.388	0.5	3.388
1999	3.405	3.405	0.5	3.405
2000	3.870	3.870	0.5	3.870
2001	4.520	4.520	0.5	4.520
2002	6.033	6.033	0.5	6.033
2003	6.190	6.190	0.5	6.190
2004	6.145	6.145	0.5	6.145
2005	5.800	5.800	0.5	5.800

Source: Authors' spreadsheet using methodology from Anderson et al. (2008)

Appendix Table 4: Annual distortion estimates, Egypt, 1955 to 2005

(a) Nominal rates of assistance to covered products (percent)

	Beef	Cotton	Maize	Milk	Rice	Sugar	Wheat	All covered
1955	-21	-21	-45	-77	-71	-34	-49	-39
1956	-17	-21	-39	-75	-68	-31	-45	-37
1957	-14	-22	-32	-70	-64	-29	-41	-34
1958	-8	-22	-25	-64	-60	-23	-37	-29
1959	-7	-22	-19	-55	-58	-18	-32	-27
1960	-20	-35	-19	-57	-56	-30	-40	-35
1961	-29	-55	-42	-73	-60	-42	-45	-51
1962	-39	-46	-37	-63	-67	-35	-53	-48
1963	-31	-56	-38	-55	-64	-79	-50	-52
1964	-44	-58	-40	-37	-65	-79	-54	-54
1965	-46	-67	-47	-63	-62	-71	-46	-59
1966	-53	-66	-34	-44	-56	-51	-40	-55
1967	-44	-55	-13	-42	-51	-11	-23	-43
1968	-49	-61	-32	-55	-60	-21	-30	-52
1969	-57	-71	-33	-48	-58	-19	-32	-59
1970	-59	-64	-26	-40	-32	-50	-11	-51
1971	-59	-63	-31	-45	-39	-57	-32	-54
1972	-53	-56	-8	-56	-33	-56	-24	-48
1973	-59	-70	-19	-55	-62	-63	-35	-58
1974	-10	-71	-28	-19	-77	-71	-48	-55
1975	24	-60	-13	-16	-64	-66	-32	-39
1976	19	-41	-15	-28	-27	-33	-22	-22
1977	47	-53	64	-21	16	-8	5	-7
1978	15	-38	52	-36	3	-4	18	-6
1979	-44	-58	31	-44	-42	-21	-32	-42
1980	-27	-56	10	-34	-35	-60	-32	-36
1981	-18	-47	-40	-48	-37	-62	-46	-41
1982	13	-33	-20	-64	-36	-10	-52	-26
1983	66	-21	81	-45	-11	28	-24	14
1984	98	-36	35	-28	21	59	-3	22
1985	34	-57	11	-44	-8	6	-21	-15
1986	193	-21	178	20	10	52	139	68
1987	205	6	386	97	15	170	207	127
1988	187	7	350	102	103	97	128	132
1989	163	-3	262	112	142	82	193	125
1990	-10	-60	44	-5	-26	-36	31	-15
1991	3	-46	60	4	19	-15	115	8
1992	-27	-45	10	-29	-20	-35	20	-22
1993	-19	-27	26	-25	-15	-21	31	-11
1994	-4	-23	14	-22	-19	-15	41	-5
1995	24	22	11	-28	-24	-28	-1	-2
1996	35	-36	-7	-26	-22	-16	-7	-9
1997	34	5	35	-18	-27	-18	70	10
1998	42	-25	40	-15	-12	10	39	15
1999	37	-38	36	-10	-6	24	47	15
2000	19	-36	43	-13	-31	59	28	5
2001	1	-50	24	-20	-27	33	8	-9
2002	-10	-51	-12	-34	-39	-20	-15	-24
2003	8	-10	-10	-25	-9	-11	-14	-8
2004	-15	-37	16	-20	-17	4	1	-11
2005	-13	-21	46	-5	-20	-22	28	-4

Appendix Table 4 (continued): Annual distortion estimates, Egypt, 1955 to 2005
(b) Nominal and relative rates of assistance to all[a] agriculture, to exportable and import-competing agricultural industries, and relative[b] to non-agricultural industries (percent)

	Total ag NRA				Ag tradables NRA				
	Covered products		Non-covered products	All products (incl NPS)	Export-ables	Import-competing	All	Non-ag tradables NRA	RRA
	Inputs	Outputs							
1955	0	-39	0	-27	-34	-43	-39	31	-53
1956	0	-37	0	-26	-33	-40	-37	31	-52
1957	0	-34	0	-24	-32	-35	-34	31	-50
1958	0	-29	0	-20	-29	-29	-29	31	-46
1959	0	-27	0	-19	-29	-24	-27	31	-44
1960	0	-35	0	-25	-39	-32	-35	38	-53
1961	0	-51	0	-36	-56	-47	-51	44	-66
1962	0	-48	0	-34	-51	-46	-48	43	-64
1963	0	-52	0	-36	-58	-46	-52	43	-66
1964	0	-54	0	-38	-59	-49	-54	44	-68
1965	0	-59	0	-41	-66	-52	-59	45	-72
1966	0	-55	0	-38	-64	-46	-55	45	-69
1967	0	-43	0	-31	-54	-34	-43	42	-60
1968	0	-52	0	-37	-60	-44	-52	44	-67
1969	0	-59	0	-42	-68	-48	-59	46	-71
1970	0	-51	0	-37	-58	-45	-51	45	-66
1971	0	-54	0	-38	-60	-49	-54	46	-68
1972	0	-48	0	-34	-52	-45	-48	41	-63
1973	0	-58	0	-41	-68	-50	-58	39	-70
1974	0	-55	0	-38	-74	-33	-55	30	-65
1975	0	-39	0	-27	-62	-19	-39	26	-52
1976	0	-22	0	-15	-35	-10	-22	24	-37
1977	0	-7	0	-5	-40	25	-7	24	-25
1978	0	-6	0	-4	-27	9	-6	23	-23
1979	0	-42	0	-28	-54	-32	-42	21	-52
1980	0	-36	0	-25	-51	-26	-36	16	-45
1981	0	-41	0	-28	-45	-39	-41	17	-49
1982	0	-26	0	-17	-34	-22	-26	18	-37
1983	0	14	0	10	-17	29	14	18	-3
1984	0	22	0	15	-22	44	22	18	3
1985	0	-15	0	-10	-45	5	-15	24	-32
1986	0	68	0	44	-9	129	68	21	38
1987	0	127	0	81	10	207	127	20	89
1988	0	132	0	86	33	182	132	19	95
1989	0	125	0	82	37	169	125	20	88
1990	0	-15	0	-10	-49	4	-15	35	-37
1991	0	8	0	5	-27	27	8	22	-12
1992	0	-22	0	-15	-37	-14	-22	23	-37
1993	0	-11	0	-7	-22	-6	-11	23	-28
1994	0	-5	0	-3	-20	1	-5	24	-23
1995	0	-2	0	-1	-10	2	-2	24	-21
1996	0	-9	0	-6	-29	2	-9	25	-27
1997	0	10	0	7	-16	24	10	25	-12
1998	0	15	0	10	-17	27	15	26	-8
1999	0	15	0	10	-17	29	15	26	-9
2000	0	5	0	4	-33	21	5	25	-16
2001	0	-9	0	-6	-39	5	-9	25	-27
2002	0	-24	0	-16	-43	-16	-24	25	-39
2003	0	-8	0	-5	-9	-7	-8	24	-25
2004	0	-11	0	-8	-25	-6	-11	22	-28
2005	0	-4	0	-3	-20	4	-4	22	-21

a. NRAs including assistance to nontradables and non-product specific assistance.
b. The Relative Rate of Assistance (RRA) is defined as $100*[(100+NRAag^t)/(100+NRAnonag^t)-1]$, where $NRAag^t$ and $NRAnonag^t$ are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

Appendix Table 4 (continued): Annual distortion estimates, Egypt, 1955 to 2005
(c) Value shares of primary production of covered[a] and non-covered products, (percent)

	Beef	Cotton	Maize	Milk	Rice	Sugar	Wheat	Non-covered
1955	16	22	7	9	8	2	5	30
1956	16	22	7	10	8	2	6	30
1957	14	26	6	9	8	2	6	30
1958	13	28	6	8	7	2	6	30
1959	13	29	5	7	7	2	6	30
1960	13	31	5	7	5	2	7	30
1961	13	28	7	11	4	2	7	29
1962	14	26	7	8	8	2	8	29
1963	12	27	6	6	8	5	7	30
1964	13	27	7	4	8	4	7	30
1965	13	30	7	6	7	3	4	31
1966	16	26	8	4	7	2	5	31
1967	18	23	7	6	11	1	5	29
1968	18	22	6	7	13	1	4	28
1969	17	29	6	5	9	1	3	29
1970	21	26	6	6	6	2	4	28
1971	21	26	7	6	4	3	5	29
1972	21	24	6	8	6	3	4	29
1973	20	24	6	6	7	3	5	30
1974	9	23	7	4	15	5	6	30
1975	9	20	7	5	13	8	7	31
1976	11	18	9	6	13	5	6	31
1977	12	28	7	7	7	4	5	31
1978	16	21	7	9	8	4	5	31
1979	20	23	4	6	7	4	4	32
1980	17	21	8	6	6	6	5	31
1981	14	18	10	7	7	7	6	32
1982	15	13	10	9	10	3	7	33
1983	18	13	8	9	8	3	7	33
1984	17	17	11	8	5	3	6	33
1985	16	20	8	8	7	3	5	34
1986	15	18	5	8	11	4	4	35
1987	19	16	5	6	10	3	5	36
1988	21	16	6	5	6	5	6	35
1989	18	16	8	7	6	5	7	34
1990	17	17	7	6	8	5	8	33
1991	19	17	8	6	7	4	6	33
1992	19	15	7	7	8	4	7	33
1993	21	13	7	7	9	4	7	32
1994	21	7	9	7	13	5	6	32
1995	15	6	8	7	14	6	10	35
1996	13	12	9	7	11	4	10	34
1997	17	8	7	8	16	5	7	32
1998	17	6	8	9	12	4	10	32
1999	17	7	8	9	14	4	9	33
2000	19	5	7	8	14	3	10	33
2001	18	10	8	8	10	3	10	34
2002	18	7	8	8	12	4	10	34
2003	19	4	9	9	12	3	11	33
2004	21	7	8	8	11	3	9	33
2005	19	10	6	7	11	4	10	33

a. At farmgate undistorted prices, US$
Source: Authors' spreadsheet