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EGYPT - TOWARD A MORE EFFECTIVE SOCIAL POLICY: SUBSIDIES AND SOCIAL SAFETY NET

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ABBREVIATIONS AND ACRONYMS

CAPMAS	Central Agency for Public Mobilization and Statistics
CCT	Conditional Cash Transfer
CES	Constant Elasticity of Substitution
CGE	Computable General Equilibrium
CO_2	Carbon Dioxide
CPI	Consumer Price Index
EGPC	Egyptian General Petroleum Company
ERS	Economic Research Service
EV	Equivalent Variation
FY	Fiscal Year
GDP	Gross Domestic Product
GOE	Government of Egypt
HH	Household
HIECS	Household Income, Expenditure and Consumption Survey
IDSC	Information and Decision Support Center
IFPRI	International Food Policy Research Institute
IMF	International Monetary Fund
IO	Input-Output
Kg	Kilogram
KWH	Kilowatt Hour
LE	Egyptian Pound
LES	Linear Expenditures System
LPG	Liquefied Petroleum Gas
MCP	Mixed-Complimentarity Problem
MOISA	Ministry of Insurance and Social Affairs
MOSIT	Ministry of Supplies and Internal Trade
MS	Micro-Simulation Model
NGO	Non-Governmental Organization
P1	Poverty-gap index
P2	Severity-of-poverty index
PCBS	Palestinian Central Bureau of Statistics
PMT	Proxy-Means Testing
PPP	Purchasing Power Parity
SAM	Social Accounting Matrix
SFD	Social Fund for Development
Tcf	Trillion cubic feet
US$	United States Dollar
WFP	World Food Programme

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The Government of Egypt (GOE) has embarked on an ambitious program of economic, social and political transformation. The reforms are wide-ranging, extending beyond macroeconomic stability, and include measures to reform the financial sector and state-owned enterprises, modernize fiscal and monetary systems and policies to better allocate public resources. This reform strategy is driven by the need to raise and sustain broad-based economic growth, and ensure that the poor contribute to and benefit from economic growth. It also entails a redefinition of the role of the state. The state can no longer be seen as the main provider of jobs, goods and subsidies for its citizens: in the new 'social contract' that the country is moving to, the role of the State is to oversee the public interest and protect the poor and vulnerable in an essentially private-sector-led economy.

Within this context, the GOE is beginning to address the role of social policy, particularly in the areas of social safety nets and subsidies. One of the findings of this report is that, despite high and increased levels of social spending, poverty in Egypt continues to be relatively high. Preliminary evidence also suggests that poverty has increased during the first half of the 2000s. Another finding of the report is that the existing in-kind subsidy programs – which form the basis of the current safety net -- are costly, ineffective, create market distortions and inefficiencies, and that benefit the rich far more than the poor.

This report shows that the long-run potential payoff from shifting resources out of the current safety net and into a substantially strengthened and expanded assistance program is huge. In particular, the poor would benefit from a strengthening of the social safety net along the following lines: (i) a significant expansion in the cash-assistance program to raise the benefit levels and expand the coverage; (ii) enriching the safety net with better targeting methods like proxy-means testing and greater use of geographic targeting in order to direct a substantial fraction of public resources to the intended beneficiaries, while minimizing the leakage to the wealthy, (iii) the introduction of a conditional-cash transfer program that helps the poor enhance their human capital, and (iv) the introduction of a workfare program at very low wages that provide temporary jobs for the able-bodied poor.

The report also identifies short-run policy reforms for the in- kind, energy and food subsidies:

- *In-kind subsidies are important and it would not be politically feasible to eliminate them in a short time period. However, the report proposes a number of practical options that the GOE could pursue. These were identified by analyzing the expected impact on different groups of the population, using a recent household survey and a computable general equilibrium model (CGE).*

- *Energy subsidies are substantial, with an economic cost of 8.1 percent of GDP in FY04. Gasoline subsidy primarily benefits the rich and should be eliminated. In contrast, the report recommends maintaining the kerosene subsidy in the medium-run, as it primarily benefits the rural poor. Given its relatively low opportunity cost, the report supports the expansion of the urban natural gas network, and recommends actions to help the poor benefiting from this expansion. Reforming the costly LPG subsidy is also important. Subsidies on diesel and fuel oil are costly, distortionary, and should be reformed, but it is recommended that this be done following a detailed study of the expected impact of this reform on the production sectors.*

- *While their economic cost is much lower than the energy subsidies, food subsidies are important to the poor, and they have been a cornerstone of the country's social policy. Yet, they are ineffective and inefficient in reducing poverty. The report acknowledges that the bread subsidy is politically difficult to modify in the short-run, and it argues that using geographic targeting can transform it to a progressive subsidy with a significant poverty impact. Moreover, the high-quality "10-piaster bread" is only consumed by the well-off, and its subsidy should be eliminated. The report also recommends improving the targeting of the ration-card goods by revising the eligibility criteria, increase the distinction between low- and high-subsidy cards, and enforce compliance with conditions for these cards.*

A. INTRODUCTION

1. **This report focuses on improving the system of in-kind subsidies and social safety net. The report is written at the request of the GOE following its high-level retreat with the World Bank in February 2005.** The retreat was co-chaired by the Prime Minister and the President of the World Bank, and focused on complementing Egypt's economic reform program with a strong and more effective social development agenda, with a particular focus on enhancing the efficiency and targeting of the social safety net and subsidies. The retreat participants focused on lessons of international experience, particularly those of Mexico and Brazil, and their relevance to the Egyptian context. At the conclusion of the retreat, the GOE requested the Bank to carry out a study that would specifically: (i) take stock of the in-kind subsidies along with assessing their impact on the budget, price distortions, how well targeted they are to the poor, (ii) analyze options for enhancing the social safety net, and (iii) identify options for reforming the subsidies and estimating the impact of implementing these reform options. Moreover, the GOE immediately formed a Social Policy team headed by the Prime Minister, with the mandate of articulating the social reform agenda, with four subgroups working on: improving targeting, addressing price distortions of subsidies, developing a vision of the social safety net, and tackling the social insurance challenges. The Social Policy team is also supported by additional technical work carried out by the Information and Decision Support Center (IDSC), the think-tank affiliated with the Prime Ministry. This report is therefore an input into this policy-making process, which is expected to lead to prioritization and sequencing of the reform policies.

2. **This report is also linked to ongoing and previous Bank work on Egypt**. This work is grounded in the World Bank's Country Assistance Strategy (CAS) for Egypt, which has other complementary components. In particular, the ongoing Public Expenditure Review deals with improving aggregate spending, with detailed analysis of spending patterns in the health, education, water and transport sectors, as well as analysis of macro-fiscal situation, fiscal management, decentralization, the budget process, and civil service reform. This work has also been coordinated with the Bank team providing technical assistance in the energy sector, particularly in natural gas and electricity. Moreover, this work follows important joint contributions by the Bank and the Ministry of Planning -- the Poverty Assessment Report in 2002 and the Poverty Reduction Strategy of 2004. This report is grounded in analysis of poverty and distribution of economic welfare on the basis of the most recent HIECS for 2004 (July-September period). The first chapter of the report establishes the updated profile of poverty and inequality, with the second chapter exploring options of enhancing the social safety net, while the third and fourth chapters deal with subsidies on food and energy items, in terms of their current impact and options for reforming them. The following are the key messages of the report.

B. FIGHTING POVERTY THROUGH GROWTH AND IMPROVED SOCIAL POLICY

3. **Poverty continues to be a major challenge, with one out of every five Egyptians living in poverty**. About 13.6 million people had a consumption expenditure below the poverty line, with an

average annual expenditure of LE 1,438 per capita in FY04. Attacking poverty requires a better understanding of its nature, including who the poor are. While poverty is widespread throughout the country, it affects some groups more than others. About three-quarters of the poor live in rural areas, with 55 percent living in rural Upper Egypt. A majority of the poor work in agriculture and construction. As in other countries, the risk of poverty is reduced with higher levels of educational attainment of the household head. Moreover, the nature of poverty in Egypt is that while many people live below the poverty line, they do not live far below it. The sum of shortfalls below the poverty line for all the poor amounts to about LE 4.2 billion, just under 1 percent of GDP. Yet, attacking poverty would entail much higher cost than a simple injection of this amount, given the effort and expense needed to identify the poor. Effective poverty reduction requires improved targeting of social policy, in addition to growth that improves the living conditions for all.

4. **A significant fraction of the population is vulnerable to falling into poverty, with evidence of a mild increase in poverty between 1999 and 2004.** A significant fraction of the population has consumption expenditure just above the poverty line, making them vulnerable to falling into poverty in case of adverse economic conditions. For example, a uniform 20 percent reduction in consumption would increase the number of poor to 33 percent of the population. Indeed, preliminary evidence for part of the year (July-September) points to increasing poverty, from 18.4 in 1999 to 19.6 percent in 2004. While this evidence needs to be confirmed with data for the full year when it becomes available, this poverty increase was the outcome of sluggish growth that benefited mostly the well-off while the poor were left worse-off. This reversed the earlier trend of poverty reduction in the second half of the 1990s, when the incidence of poverty declined by 2.7 percentage points during a period of high growth.

5. **Higher broad-based growth is essential for poverty reduction**. A medium-term poverty-reduction strategy must rely on structural economic reforms that generate and sustain high levels of economic growth for everyone. To illustrate, GDP grew at an average rate of 5.1 percent per annum during FY96-FY00; leading to the observed reduction in poverty during that period. However, with a slowdown in the momentum for reform, GDP growth rate decelerated to an average of 3.2 percent per annum between FY01 and FY03. This deceleration of growth accompanied a decrease in both public and private investment, rising fiscal balance deficit, and limited reforms. These macroeconomic developments along with the currency depreciation – 30 percent over 2003-2004 – led to unemployment increasing from 9.0 percent in FY00 to 9.9 percent in FY04, higher increases in food prices relative to prices of other commodities, and sluggish growth in agriculture and stagnation in construction (the primary sectors employing the poor). It is therefore not surprising that poverty and inequality increased during this period. An upcoming Poverty Assessment Report will explore in depth the links between macroeconomic growth and poverty during the first half of the 2000s.

6. **An effective, well-targeted social safety net is also an essential instrument for attacking poverty**. A good social safety net is not a substitute for growth but an essential complementary component for attacking poverty. To reduce poverty effectively, it has to be well-targeted. For five decades, policymakers have persistently shown a strong concern for social equity and political stability. More recently, social spending on education, health, welfare, transportation, and direct subsidies increased from 8.4 percent of GDP in FY00 to 9.8 percent in FY04. Yet, this did not prevent poverty and inequality from increasing, albeit mildly, during the same period. Moreover, there is limited capacity to expand social spending, given the high levels of fiscal deficit (5.7 percent of GDP in FY04) and public debt (76 percent of GDP in FY04). Thus, effective poverty-reducing social policy requires examining the instruments of the social safety net and subsidies with a view to increasing their effectiveness and improving their targeting. This is the subject of this report, which focuses on the subsidies on food, electricity, and energy products as well as on safety-net components of social assistance cash transfers from the Ministry of Insurance and Social Affairs (MOISA) and Social Fund for Development (SFD) – a quasi-public institution independent of MOISA- programs.

C. CHANGING ROLE OF GOVERNMENT REQUIRES REFORMING THE SAFETY NET AND SUBSIDIES

There are four important reasons to reform the safety net and system of in-kind subsidies.

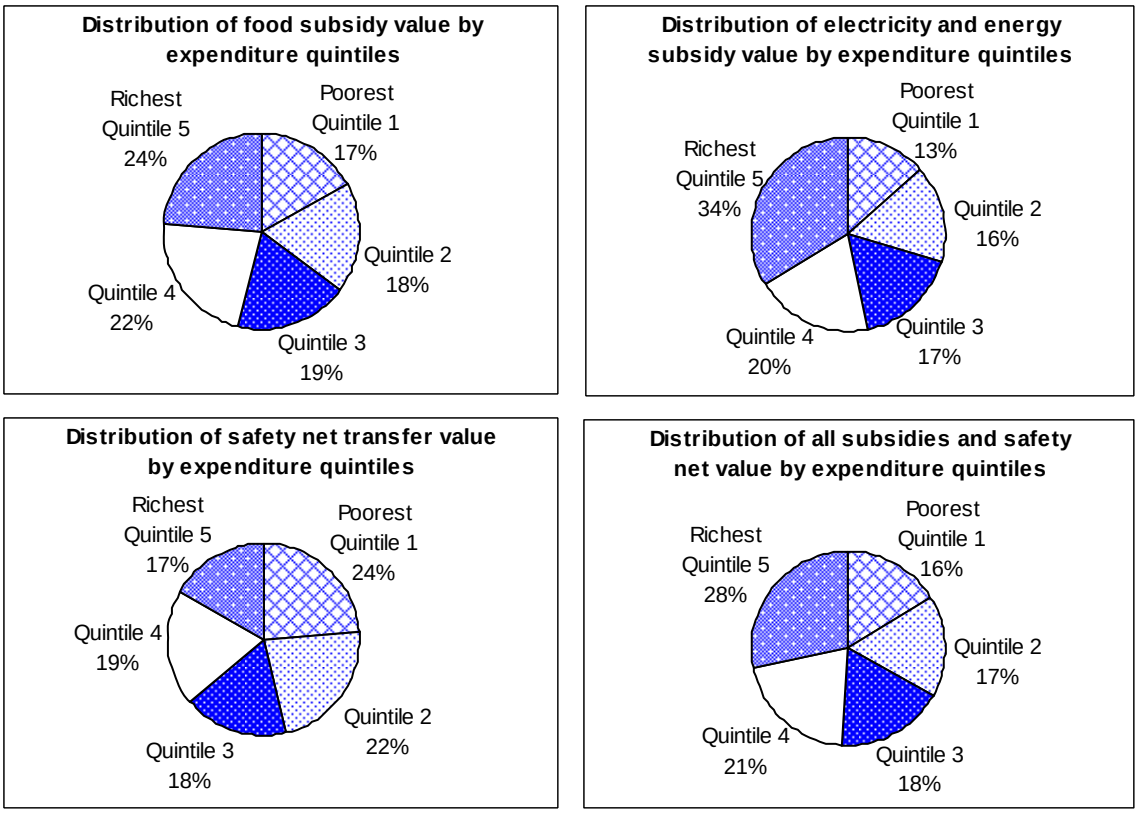
7. **The high level of spending on the safety-net and subsidy systems can be justified only if there is no socially preferable use of those resources**. Approximately 10.8 percent of GDP in FY04 is spent on the safety-net and subsidy systems. This is more than 30 percent of public expenditure. Spending on both energy and food subsidies has increased dramatically in recent years. Such high levels of aggregate spending may be justified if the benefits to society are sufficiently great and no alternative use of resources could bring greater benefits. However, as the following paragraphs show, the benefits from the existing pattern of spending are limited and could be vastly increased through reforms. Moreover, the overall spending is unbalanced, with very little spent on cash transfers (0.12 percent of GDP) and SFD programs (0.18 percent of GDP) while a very large amount is spent on in-kind subsidies on food (1.7 percent of GDP) and energy products (8.1 percent of GDP).

8. **Given the spending levels, the safety-net and subsidy systems do not go far enough in reducing poverty or improving the lives of the poor.** Many poor households are not reached by any of the existing programs, due to the geographic areas in which the poor tend to live (rural Upper Egypt) and to the eligibility criteria for ration cards. Moreover, even those poor households that are reached by the programs receive benefits that are insufficient to raise them out of poverty. By themselves, food subsidies reduce poverty by 5 percent of the population. The direct household impact of energy subsidies reduces poverty by 5.7 percent. More specifically, the subsidy on baladi bread reduces poverty by 2.7 percent, LPG by 4.4 percent, and kerosene by 1.1 percent. In contrast, the small cash-transfer program reduces poverty by a mere 0.6 percent (See Table 1).

9. **The safety-net and subsidy systems are badly targeted, making them costly and inefficient in reducing poverty because a large part of program resources go to households that are not poor.** In fact, the poorest quintile of the population receives only 16 percent of the safety-net and subsidy resources, less than their share in the population, while the wealthiest quintile receives fully 28 percent of the resources (see Figure 1). In other words, a rich person receives almost twice as much of the safety-net and in-kind subsidies as a poor person! (This so-called regressiveness is worst with regard to the energy subsidies.) As a result, the cost to deliver US$ 1 worth of benefit to a poor household is very high by international standards (see Table 1).

10. An additional rationale for reform, particularly of the energy subsidy system, is that it creates distortions, which reduce the overall efficiency of the economy. Prices in a market economy play a central role in indicating relative scarcity and guiding optimal resource allocation. The subsidy rate is very high, particularly for energy products (see Table 1). But when energy prices are fixed at low levels, firms and households make their choices on the basis of prices that give a false indication of resource abundance. As a result, firms and households consume excessive quantities of energy, which contributes to pollution and environmental degradation and – for any level of production – lower export revenues. Moreover, firms direct investment to energy-intensive sectors: it is likely that some existing industries maintain profitability only because of the energy subsidies and that GDP could be sustained at a higher level if such distortions were eliminated.

Figure 1: System of Subsidies and Safety Net Benefits the Wealthy Far More than the Poor



(Equal distribution of benefits provides 20 percent to each quintile)

D. KEY POLICY RECOMMENDATIONS`

11. **There is a need for a long-run strategy that moves the social policy from primary reliance on in-kind subsidies to reliance on cash transfers**. There is a need to articulate a long-run vision of the social safety net. As the GOE is moving toward a market-led economy with primary reliance on the private sector to produce private goods, there is little rationale for in-kind GOE subsidies of food and energy products in the long-run. Protection of the poor and vulnerable will need to rely on direct transfer instruments, and increasingly in return for a certain behavioral response from the household (conditional cash transfer, workfare program). However, Egypt's current social policy has evolved over decades and will not be easy to transform quickly. This calls for a time-bound action plan that moves the social spending from its current primary reliance on in-kind subsidies to a primary reliance on transfers. This will emerge out of GOE prioritization and sequencing of reforms needed to move to the long-run vision of the social safety net. This report contributes to this process in two ways. First, it identifies the issues surrounding various long-run options of safety net and in-kind subsidies. Second, it advocates certain *short-run* reform policies on the basis of a combination of factors like the impact on the poor, budgetary and distortionary impacts.

12. Table 2 provides an overview of the policy recommendations and their expected impacts. The following messages emerge from these recommendations.

- *The cash-transfer program needs to be substantially strengthened,* with increased benefits, broader coverage, improved targeting, and enhanced program administration. This needs to be done immediately in order to help the poor as well as to make it possible to implement other subsidy reforms by providing a poverty-mitigation mechanism.
- *In the short run, reforming the energy subsidies is more important than reforming food subsidies*. Subsidies on electricity, oil and gas products are collectively much more costly than food subsidies, they create greater distortions, and they benefit the rich much more than the poor. It is important to realize that energy subsidies would also have significant impacts on the production sectors as well as households.
- *A strategy for reforming energy subsidies needs to be developed*, with some of its components clearly identified here. In the short-run, the gasoline subsidy should be eliminated, as it primarily benefits the rich, but the kerosene subsidy should be maintained, as it primarily benefits the poor. Given that the opportunity cost of natural gas is much lower than that of LPG, it is recommended to substantially expand the natural-gas network in urban areas and develop mechanisms for helping the urban poor benefit from this network. This would facilitate phasing out the LPG subsidy in urban areas, although a strong cash-transfer program in rural areas would be needed to mitigate the expected impact of phasing out the LPG subsidy on the rural poor. The diesel and fuel-oil subsidies should be phased out due to their distortionary and budgetary impacts (with saved funds used for financing the expansion of the social safety net). But it is important to conduct a study on their expected impact on various production sectors before implementing this reform.
- *Within the food subsidies, reform of the ration-card system could be phased in more quickly than reforming bread/flour subsidies*, though it would have a fairly small budgetary impact. The subsidy on 10-piaster bread can be eliminated, while maintaining the supply, given it largely benefits the rich. Reforming the baladi bread and wheat flour subsidy in the near future is best done by using geographic targeting.

13. ***Implementation of the recommended reforms will certainly face key political economy challenges***, particularly from the losers who will likely be more vocal than the winners, as the following examples illustrate. An important constituency of winners includes the youth and the future generation who will inherit a more efficient economy less burdened with debt if the effectiveness of the social safety net is strengthened. Among the current generation, the recommended geographic targeting will re-direct the bread/flour subsidy away from the (largely urban) rich and middle classes to the (largely rural) poor. Phasing out the gasoline subsidy will primarily hurt the rich, while the reduced gasoline consumption will reduce the budgetary burden, improve the environment, and therefore benefit the whole population. Phasing out the energy subsidies will hurt its consumers in the short-run -- the rich more than the poor -- but it will increase efficiency and improve aggregate welfare; if implemented along with well-funded and well-targeted cash transfer schemes, the poor could come out ahead. These challenges are to be expected given many of the in-kind subsidies are currently perceived to be "entitlements" for rich and the poor alike. In addition to policy reform that protects the poor and vulnerable, two additional actions are essential for the success of these reforms: (i) the GOE should design an effective communication campaign that develops the message on behalf of the expected winners from the reform and of the country as a whole; (ii) the transition program needs to be addressed carefully, and should draw on the lessons learned from recent experiences in reforming their subsidies and safety net (Jordan, Yemen, Indonesia). One important lesson is that a sequence of small increases in prices of subsidized goods may generate less of a public outcry from the potential losers than one big adjustment.

Table 1. Overview of the social safety net and subsidies

Program	Economic Cost	Estimated Poverty Impact	Relative Importance	Leakage	Efficiency	Subsidy Rate
	(% of GDP, FY04)	% of population lifted above poverty line	Subsidy as % of consumption of poorest quintile	% of subsidy resources to richest quintile	Delivery Cost per LE 1 going to poor	(%)
Safety Net	0.3	0.6	1.0	17.0	4.4	n.a.
Cash transfers	0.1	0.6	1.0	17.0	4.4	n.a.
Social Development Fund	0.2	n.a.	n.a.	n.a.	n.a.	n.a.
Food Subsidies	1.7	5.0	9.0	24.0	5.4	61.4
Baladi bread	1.3[A]	2.7	5.3	21.0	5.2	67.0
10-Piaster bread	n.a	0.0	0.1	74.0	46.4	47.0
Ration Card Goods B	0.4	1.9	3.6	20.0	5.1	37.0
Electricity subsidy	0.2	0.8	1.4	28.0	7.8	9.5[C]
Energy Subsidy	8.1	5.7	7.6	34.0	7.7	75.7
LPG	1.1	4.4	5.4	24.0	7.7	88.0
Gasoline	0.3	0.0	0.0	93.0	497.1	47.6
Kerosene	0.2	1.1	2.2	9.0	3.2	81.0
Natural gas	3.0	0.1	0.1	65.0	31.4	79.7
Others (Diesel, Fuel oil, asphalt)	3.3	n.a.	n.a.	n.a.	n.a.	
Total	10.3					

NOTES:
[A]: subsidy cost of 1.3 percent of GDP is for baladi bread, 10-piaster bread and wheat flour.
[A]: Ration card goods include: sugar, oil, tea, ghee, beans, lentils, rice, and pasta.
[C]: The electricity rate shown here is a combined one. The subsidy rate for electricity varies according to consumption bracket
n.a.: not available or not applicable.

Table 2. Matrix of Policy Recommendations

Program	Policy Recommendation	Expected Impact
Safety Net	• Increase funding for safety net • Streamline institutional coordination and program administration	
Cash Transfers	• Increase cash-assistance funding, to: – expand coverage, and – raise benefit levels • Improve targeting by greater reliance on – geographic targeting, and – proxy-means testing	Almost 4 million people lifted out of poverty if a proxy-means test is used in conjunction with a budget of LE 3 billion.
Other Programs	• Assist the vulnerable by workfare programs that provide temporary jobs at low wages • Introduce conditional cash transfer to build human capital while helping the poor	Lower poverty and development of long-run human capital
Food Subsidies	• Gradually replace all food subsidies with targeted cash-transfer program (over the medium term) • Improve targeting of food subsidies while expanding cash-transfer program (in the short run)	Shift subsidies from moderately regressive to highly progressive
Baladi Bread/flour	• Use geographic targeting to direct baladi bread and flour subsidies to the poor	0.5 percent reduction in the consumption of the rich, and an increase of 2.3 percent in the consumption of the poor
10-Piaster Bread	• Eliminate subsidy while maintaining supply, as it mostly benefits the rich	
Ration-Card Goods	• Revise eligibility criteria to eliminate some categories (e.g., pensioners, public business sector) while introducing more poverty-focused criteria similar to proxy-means testing and geography • Actively enforce compliance for low- and high-subsidy ration cards • Increase distinction between low- and high-subsidy ration cards. For low-subsidy card, – reduce subsidy rates, and – eliminate products from ration, particularly those newly-introduced in May 2004 • Evaluate results of "smart card" pilot and ongoing analysis at IDSC	Targeting improved drastically; potentially 700,000 individuals raised out of poverty
Energy Subsidy	• Develop long-run strategy to liberalize market • Establish a mechanism for continuous price adjustment over the medium run	Efficient energy use; Cleaner Environment improved welfare Budgetary savings
Natural Gas	• Expand natural-gas network in urban areas to include the urban poor	Improved resource allocation
LPG	• Phase out LPG subsidy, following expansion of natural gas in urban areas and building effective safety net in rural areas	
Gasoline	• Eliminate gasoline subsidy that primarily benefits the rich	Budget savings of LE 1.3 billion
Kerosene	• Maintain kerosene subsidy that primarily benefits the poor	
Diesel	• Conduct a study of impact on production sectors before phasing out	
Fuel Oil	• Conduct a study of impact on production sectors before phasing out	
Electricity Subsidy	• Phase out electricity subsidy but maintain lifeline rate system	Budgetary savings; no adverse poverty impact

CHAPTER 1: CHALLENGE OF POVERTY REDUCTION AND SOCIAL POLICY

One out of every five Egyptians is poor. Moreover, preliminary evidence shows poverty to have increased mildly between the first quarters of FY01 and FY05, a period characterized by slow growth and increased social spending. While ambitious economic reforms are envisioned to raise growth levels, policymakers are faced with the challenge of reducing poverty and attending to the implications to society as a whole, as well as to groups within the society, of ongoing reforms. Poverty reduction requires broad-based, shared growth that directly benefits the poor. Moreover, the GOE must redefine the social safety net to improve how it targets the people it serves, to expand programs that are effective in fighting poverty, and to cut spending on ineffective programs. By identifying the characteristics of the poor – and how these characteristics have changed in recent years – this Chapter provides the background information needed for safety net targeting mechanisms which are developed in Chapter 2.

A. POVERTY CONTINUES TO BE A MAJOR POLICY CHALLENGE:

Though extreme starvation is not common, poverty is widespread problem in addition to a significant fraction of the population that is vulnerable to falling into poverty.

1.1. **Poverty continues to be a major challenge, with one out of every five Egyptians (about 13.6 million people) living in poverty**. This report relies on the nationally representative Household Income, Expenditure and Consumption Survey (HIECS) for the period of July-September 2004 (see Box 1.1). Analysis of this dataset shows that 19.6 percent of Egypt's population had consumption expenditure below a poverty line with an annual average per capita of LE 1438 in 2004. The poverty line is calculated as the cost of basic needs, both nutritional and non-nutritional.

1.2. **The nature of the poverty problem is that while many people live below the poverty line, they do not live far below it.** Extreme starvation is not common in Egypt. The depth of poverty is measured by the "poverty gap index", which stood at 3.87 percent in 2004 for the whole population. This index indicates the amount that would be needed to raise the expenditures of every poor up to the poverty line, thus eliminating poverty (i.e., the potential gains that can be achieved by better targeting of social policy). For Egypt that amount is LE 4.16 billion, amounting to 0.9 percent of GDP in FY04 0.8 percent of GDP in FY05. This indicates the cost that could be incurred by giving every poor person a consumption level equal to the poverty line. The annual shortfall below the poverty line averaged LE 300 for every poor person, implying that poor people had consumption expenditure at about 21 percent below the poverty line.

1.3. **In addition, there is also a considerable population concentration just above the poverty line: those who are vulnerable to falling into poverty as a result of small negative shocks to their income**. If people's consumption expenditure fell uniformly by only 20 percent (or LE 0.8 per day and LE 288 per year per capita), the number of poor would increase by two-thirds: from 13.6 million to 22.9 million people, a third of the whole population. A 30 percent uniform reduction in consumption would double the number of the poor to 40.4 percent of the whole population. Given this high vulnerability, it is important to analyze the implications of

specific economic reforms for both society as a whole and the patterns of economic distribution, to ensure they do not adversely affect the poor or middle class.

Box 1. 1: Poverty Measurement in Egypt

The measurement of poverty relies on three building blocks: the dataset, the poverty line methodology and the welfare indicator.

Dataset: The poverty analysis primarily relies on the HIECS conducted by the Central Agency for Public Mobilization and Statistics (CAPMAS), Egypt's official statistical agency. Data were collected from approximately 4,000 households every month between July 2004 and June 2005. Given the need for timely analysis, this report relies on the available data for July-September of 2004 (or first quarter, Q1, of FY05). Data for the whole 12 months will be analyzed in an upcoming Poverty Assessment Report. The collected data are nationally representative for each quarter. Given the scope for seasonal effects, comparison with the earlier period is done for the same quarter (July-September) of 2000. The almost identical design of the two surveys makes them comparable. Data were collected from 11,996 households in Q1 of FY01 and 11,745 households in Q1 of FY05. The questionnaire covers: (i) general household and housing-type information, (ii) socioeconomic information on individual members of each household, (iii) income components of each individual, (iv) quantities and values spent on food items collected on a daily basis during the survey month; and (v) quantities of, and values spent on, non-food items (e.g., clothing, housing, and durables) on a monthly or yearly basis.

Poverty Line: This specification follows the earlier practice in Egypt's poverty assessment (World Bank, 2002). This approach identifies the cost of basic nutritional needs, taking into account different age-sex composition, household size, and prevailing prices in each region. The nutritional needs are specified in line with minimum caloric intake, using tables from the World Health Organization. These reflect different age groups, gender, and whether the individual lives in a rural or urban area. The cost of caloric intake is calculated for different regions on the basis of the consumption patterns of the second quintile of the population; its average is about LE 1.1 per 1,000 calories. Given individuals' specific caloric needs, and region-specific caloric costs, the cost of meeting the nutritional needs is calculated for each household. The cost of non-nutritional needs is calculated on the basis of the non-food share in household expenditure for those whose total expenditure is equal to merely the cost of nutritional basic needs. The poverty lines were derived for 2004 and deflated back to 2000. The average per-capita poverty line ranged between LE 1388 and LE 1494 per annum, with a national average of LE 1438 in 2004.

Welfare Indicator: Consumption expenditure is used as the welfare indicator in the estimation of the poverty line and in making poverty assessments. It includes annual food expenditure and the value of non-food expenditure items such as electricity. Durable goods are accounted for through a yearly depreciation value.

The poor tend to live in rural areas, in Upper Egypt, with little education, working in agriculture or construction, and with little educational attainment.

1.4. **Poverty is not uniformly spread across groups: some categories of Egyptians are more likely to be poor than others.** Understanding the profile of poverty is important to develop an effective poverty reduction strategy. Who are more likely to be poor? The most important correlates of poverty in 2004 are identified here.

- **Location** is perhaps the most important correlate of poverty. There is a clear regional pattern to the incidence of poverty: lowest in the Metropolitan governorates, comprising Cairo, Alexandria, Port Said, and the Suez; highest in Upper Egypt. And within Upper Egypt itself, those living in the rural areas are twice as likely to be poor than those in the urban areas of Upper Egypt, and three times as likely to be poor than those in the rural areas of Lower Egypt. Three-quarters of the poor live in rural areas: 55 percent in rural

Upper Egypt, and 20 percent in rural Lower Egypt. The remaining 25 percent of the poor live in urban areas (see Table 1.1).

Table 1. 1: Poverty Is Not Distributed Evenly Across Regions, Q1 of FY05

Regions	Incidence of Poverty (%)	Distribution of the Poor (%)
Metropolitan Areas	6.0	5.6
Lower Egypt – Urban	10.6	6.5
Lower Egypt- Rural	13.1	20.0
Upper Egypt – Urban	20.4	12.7
Upper Egypt –Rural	40.9	55.2
All Egypt	19.6	100

- The **rural population** has a higher incidence of poverty (26.0 percent) compared with the urban population (11.3 percent).
- Low **educational attainment** of the household head is correlated with a higher incidence of poverty. The poverty risk for someone living in a household with an illiterate head is about 50 percent higher than the general population. If the household head has at least university education or higher, the poverty risk is less than 5 percent.
- **Working in agriculture and construction activities** is associated with greater poverty risk than working in other activities. The poverty risk of agricultural workers is 26.3 percent, and that of a construction worker is 26.0 percent. A majority of the poor (55 percent) work in agriculture, and about 10 percent of the poor work in construction. On the other hand, a worker in the financial sector faces the lowest poverty risk, 5.5 percent. The risk of falling into poverty for a manufacturing worker is 14.8 percent, also lower than the national average (19 percent).
- Female-headed households are not identified with higher poverty risk. Individuals in female-headed households have an incidence of poverty of 10.1 percent. Moreover, and given that expenditure data are collected at the household-level, it is not possible to identify the economic status of different individuals within each household, and the total expenditure is usually assumed to be equally shared among its members. In this case, it is not possible to determine a gender pattern to poverty.

And preliminary analysis shows poverty to have increased mildly between FY01 and FY05.

1.5. **Poverty increased mildly between FY01 and FY05.** The measures of poverty usually capture its incidence, depth, and severity (see Box 1.2). All three measures show poverty to have increased between the first quarters of FY01 and FY05 (Table 1.2).[1] The increase involves a relatively small percentage of the population: the incidence of poverty increased by about 1 percentage point from, 18.4 percent to 19.6 percent. Also, the poverty gap index shows an

[1] The incidence of poverty reported here for FY01 is different from that reported in the World Bank (2002) for two reasons. First, the figure reported here only covers the first quarter of the fiscal year (from July 1st, 2000 to September 30, 2000), while the earlier figure covers a full year's worth of data (from October 1st, 1999 to September 30, 2000). Second, the calculated poverty line for the World Bank (2002) is slightly different from that used here, which is based on a re-derivation of the poverty line for FY05, subsequently deflated to the prices of FY01 to capture price differences.

increase in the depth of poverty, while the increase in the poverty severity index reflects a worsening distribution of consumption expenditure among the poor. While the increases in poverty measures are relatively small, they signify the stalling and even reversal of the poverty reduction between FY01 and FY05, compared to the second half of the 1990s, when the incidence of poverty declined by 2.7 percentage points.

Table 1. 2: Measures of Poverty, FY01 and FY05

(in % for first quarter)

Poverty Measure	FY01	FY05
Headcount Index of Poverty (P0)	18.36	19.63
Poverty Gap Index (P1)	3.12	3.87
Poverty Severity Index (P2)	0.80	1.17

Box 1. 2: Measures of Poverty

There are three aspects to measuring poverty: incidence, depth, and severity, and these are captured by three standard Foster-Greer-Thorbecke (1984) aggregate poverty measures. The incidence of poverty is measured by the headcount index (P0). It estimates the percentage of the population that is poor. The headcount ratio is easy to interpret, but it says nothing about the depth or severity of poverty.

The depth of poverty is measured by the poverty-gap index (P1), defined by the mean distance below the poverty line as a proportion of that line, where the mean is formed over the entire population, counting the non-poor as having zero poverty gap. Thus the sum of poverty gaps aggregated across all individuals reflects the minimum amount of consumption that needs to be transferred to pull all the poor up to the poverty line.

The severity-of-poverty index (P2) represents the mean of the squared proportionate poverty gaps. Unlike the headcount ratio and the poverty-gap ratio, it takes into account inequality among the poor. The severity-of-poverty index is sensitive to the distribution of consumption among the poor, in that heavier weights are given to those whose consumption falls far below the poverty line. This index is thus more sensitive to changes in welfare of the ultra-poor (those with extremely low consumption below the poverty line) than it is to those just below the poverty line.

The poverty measures are defined as follows:

$$P0 = \frac{q}{n}\ ; \qquad P1 = \frac{1}{n}\sum_{i \in Q}\frac{(z - y_i)}{z};$$

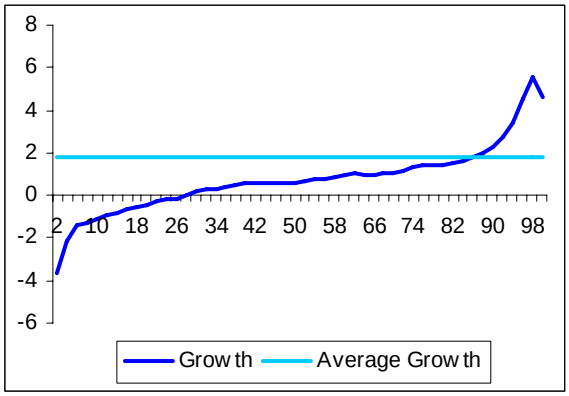
$$P2 = \frac{1}{n}\sum_{i \in Q}\frac{(z - y_i)^2}{z^2}$$

where n represents the total population and q represents the number of individual with consumption y_i less than the poverty line z.

1.6. **This result showing increasing poverty between FY01 and FY05 is preliminary, and requires further detailed understanding**. This result is based on comparing the first quarters of FY01 and FY05. A fuller analysis with a full year's worth of data will be essential to re-check this result, and reduce any potential impact of seasonality on this result. This analysis will be carried out in an upcoming Poverty Assessment Report, once the dataset for the entire period of July 2004-June 2005 becomes available.

1.7. **Growth during the early 2000s appeared to benefit mostly the well-off.** The growth-incidence curve in Figure 1.1 shows the percentage change in expenditure at different positions (e.g., 1st percentile, 2nd percentile, etc.) within the distribution, from poorest to richest. The graph clearly shows that the poorest segment suffered a loss in expenditure; therefore, growth did not benefit the poor in an absolute sense. Generally, richer individuals had greater benefit from growth, and the poor were left worse-off. Indeed, the growth-incidence curves are also largely upward-sloping at the regional levels (metropolitan, rural-urban upper and lower Egypt), indicating improved relative position of the rich at the regional level as well.

Figure 1. 1: Growth-Incidence Curve Between First Quarters of FY01 and FY05



1.8. **Slow growth and increased inequality led to the increase in poverty between FY01 and FY05.** Commensurate with slow aggregate GDP growth, real per-capita consumption increased by 1.85 percent per annum between the first quarters of FY01 and FY05. A statistical decomposition shows that if inequality had been unchanged between the two years, growth in expenditure would have *reduced* poverty by 3.6 percentage points. However, inequality increased during this period. The Gini index of inequality rose from 0.31 to 0.35 between the first quarters of FY01 and FY05.[2] The increased inequality by itself, without any change in average levels of expenditure, would have increased poverty by 4.8 percentage points between FY01 and FY05. The combined effects of the inequality increase and slow growth led to the overall increase in poverty by 1.2 percentage point between the two years.

1.9. **There are numerous factors contributing to the slow growth and increased inequality**. There was a deceleration of GDP growth to 3.2 percent per annum during FY01-FY03, from an annual growth rate of 5.1 percent per annum during FY96-FY00. This deceleration of growth accompanied a decrease in both public and private investment, rising fiscal balances, and limited reforms (see World Bank, Egypt CAS, 2005). One key development during this period is the depreciation of the currency by 30 percent during 2003-2004, which may have led to observing the

[2] The Gini index is the standard measure of inequality, and represents the statistical dispersion among expenditures of the whole population. It ranges between zero for perfect equality and one for perfect inequality. Typically, the Gini index of expenditure inequality is between 0.3 and 0.4.

full price impact in the survey in the summer of 2004, but with delayed impacts on growth and exports until later in FY04 and beyond. GDP growth is estimated at 5 percent in FY05, pointing to a robust recovery from the earlier period of sluggish growth. An upcoming Poverty Assessment Report will explore in depth the macro-micro linkages among growth, inequality, and poverty, with a focus on wage and employment trends, sectoral and regional growth patterns, and trends in prices, exports, and consumption. Evidence on three such linkages between sluggish growth and patterns of household incomes, to be examined in greater depth in the Report, is highlighted here:

- *The rate of unemployment rose form 9 percent in FY00 to 9.9 percent in FY04*, with evidence of a recent decline to 9.5 percent in FY05.
- *Food prices rose faster than the general consumer price index (CPI), disproportionately hurting the poor*. Between December 2002 and August 2004, food prices rose by 27.2 percent, almost twice the increase in the consumer price index (14.2 percent). Given the food share in their expenditure is greater than that of the rich, the poor was more negatively affected by this relative price increase. Therefore, the poorest decile of the population faced a greater increase in the price index of their consumption basket (36.3 percent) than the CPI for the whole population (31.6 percent) between FY01 and the first quarter of 2004. For comparison, the price increase in the consumption basket of the richest decile was 26.4 percent during this period.
- *Growth has been slow in the construction and agriculture sectors that employ a majority of the poor*. Most of the recent recovery in FY05 has been driven by activities exposed to the external sector (restaurants and hotels, Suez Canal activity, and oil and gas sector). The construction sector has been stagnant, growing at an average rate of 1.4 percent per annum during FY00-FY05. Agriculture has grown at about the same sluggish overall growth rate of GDP (14.7 percent total) between FY00-FY04.

1.10. The regional pattern of growth and inequality is likely to emerge as one of factors contributing to explaining the developments in the first half of the 2000s. Poverty was reduced in rural Lower Egypt (from 16.3 to 13.1 percent), as a result of strong growth in per-capita expenditure, at an annual rate of 3 percent (countered by a mild increase in inequality). On the other hand, poverty increased in rural Upper Egypt, which already had the highest incidence of poverty, given a negative growth rate of per-capita expenditure (-0.5 percent per annum). Indeed, it is the only region that did not experience any growth during this period. In the urban regions, increased inequality was strong enough to outweigh the poverty-reducing impact of growth, resulting in increased poverty (see Table 1.3). While these region-specific trends in growth and poverty will need to be further explained, the inter-regional inequality is likely to play a role in explaining the aggregate trends in inequality and poverty increase.

Table 1. 3: Regional Aspects of Change in Poverty, Inequality and Growth
Between FY01- FY05

Regions	Expenditure growth rate	Gini Index of Inequality		Headcount Index of Poverty (%)	
	(% per annum)	FY01, Q1	FY04, Q1	FY01, Q1	FY04, Q1
Metropolitan	0.37	0.35	0.40	3.7	6.0
Lower Urban	3.82	0.22	0.32	6.6	10.6
Lower Rural	2.97	0.19	0.23	16.3	13.1
Upper Urban	2.75	0.33	0.40	18.1	20.4
Upper Rural	-0.48	0.22	0.25	35.9	40.9
Total	1.85	0.31	0.35	18.4	19.6

1.11. **The increase in inequality has important policy implications**. The 4-percentage-point increase in the Gini index over a four-year period is a relatively rapid increase, compared to the 3-percentage-point increase per decade found for a large cross-section of countries (Deininger and Squire 1996). Despite this increase, the level of inequality is average for a developing country, where the Gini index typically ranges between 0.30 and 0.40. Yet, this increased inequality will lower the growth elasticity of poverty, requiring much higher growth rates to achieve any given poverty-reduction target. Sustained increases in inequality will likely give rise to social conflict, especially if accompanied by slow growth.

B. REDUCING POVERTY REQUIRES HIGHER, BROAD BASED GROWTH AND AN EFFECTIVE SOCIAL SAFETY NET

Higher broad-based growth is essential for poverty reduction

1.12 **Economic growth is essential for reducing poverty in the medium run, and requires acceleration of economic reforms**. While Egypt's economy has grown since 2000, growth has been very slow, particularly compared to the second half of the 1990s. GDP grew at an average rate of 5.1 percent per annum during FY96-00; this growth primarily accounted for the observed reduction in poverty during that period. However, with a slowdown in the momentum for reform, GDP growth rate decelerated to an average of 3.2 percent per annum between FY01 and FY03. A medium-term poverty-reduction strategy must rely on structural economic reforms that generate and sustain high levels of economic growth for everyone. As an illustration, poverty would be reduced to 14 percent if consumption expenditure were to grow by 10 percent uniformly (or LE 0.4 per day and LE 144 per year per person). A uniform consumption expenditure growth rate of 20 percent (LE 288 per year) would reduce poverty to 10 percent – a reduction of nearly half.

1.13. **The type of growth matters for poverty reduction.** In particular, rural Upper Egypt, which is the poorest part of the country, needs to share in the overall economic growth for effective poverty reduction. The evidence from the FY01-FY05 period shows that growth can occur while the poor and vulnerable become worse off. Growth may not necessarily trickle down, and the poverty and social implications of economic reform should be taken into account. While Egypt's level of inequality is not excessive by international standards, ensuring shared growth requires implementing policies that permit the poor to benefit from the growth, including human resource policies, and policies that transfer adequate benefits to the rural population (particularly in Upper Egypt).

And it is important to have an effective, well-targeted social safety net

1.14. **The increase in poverty occurred despite historically strong, and even recently increased, level of public social spending, particularly on the social safety net.** Social safety nets are not a substitute for good macroeconomic policies, but they can help improve the living standards of the poor. To reduce poverty effectively, they have to be well-targeted. For five decades, policymakers have persistently shown a strong concern for social equity and political stability. This is reflected in the significant public resources that have been consistently allocated to social-spending items. Social spending has remained constant or even increased as a percentage of GDP even during periods when total GOE spending on all goods and services was declining as a share of GDP, as during the reforms of the 1990s (see Figure 1.2). Social spending on education, health, welfare, transportation, and direct subsidies increased from 8.4 percent of GDP in FY01 to 9.8 percent in FY04.[3] The budget accounts for direct subsidies, which mostly cover food items, but also include other items such as some health, transportation and agricultural subsidies. Direct subsidies were reduced by the structural reforms of the 1990s from 2.6 percent of GDP in FY93 to a range of 1.4 to 1.6 percent during FY98-FY01; recently, direct subsidies have significantly increased (to 2.2 percent of GDP in FY04), and are expected to be even higher in FY05 (see Figure 1.3). Thus, the increased poverty and inequality between FY01 and FY05 has occurred despite increasing subsidies and social public spending.

Figure 1. 2: Social Spending as a Percentage of GDP

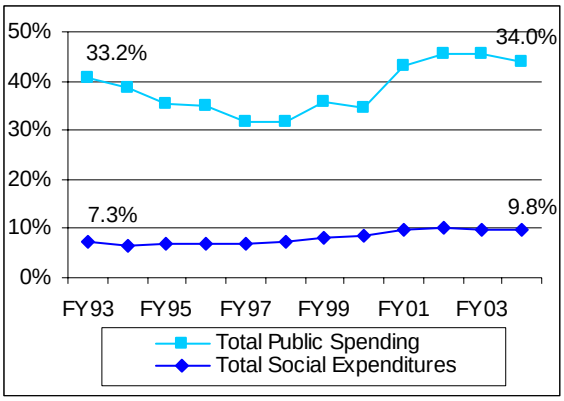
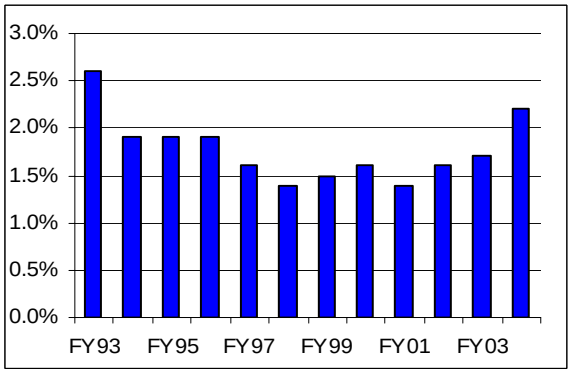


Figure 1. 3: Direct Subsidies, FY93-FY04 (% of GDP)



[3] Prior to the FY06 fiscal budget, only food subsidies and some other minor items were reported explicitly as direct subsidies. In the FY06 budget presented to the Parliament, energy subsidies are reported where previously they were identified as implicit subsidies.

1.15. **There is limited capacity to expand total social spending, which is relatively high, and has increased recently.** Examining the patterns of aggregate GOE spending in order to recommend that public spending offer more benefits to the poor is outside the scope of this report. Yet it is important to realize that macroeconomic stability requires controlling aggregate public spending, given an already high fiscal deficit (5.7 percent of GDP in FY04) and public debt (76 percent of GDP in FY04). International evidence has shown that macroeconomic stability is important for ensuring growth that benefits the poor, and that the poor can suffer disproportionately from macroeconomic instability.

1.16. **Poverty reduction requires a better design of the social safety net, given its available funding.** The fact that poverty and inequality increased during a period of increasing social spending calls into question the effectiveness of the safety net. Analysis in this report also shows that a significant portion of public social spending is captured by the rich, while the benefits reaching the poor are largely inadequate to lift them out of poverty. A redesign of the safety net would include better targeting so that a higher fraction of public resources reach the poor and vulnerable, expanding instruments that are more effective in poverty reduction, and gradually phasing out spending on ineffective programs.

C. CONCLUSION AND REPORT COVERAGE

1.17. With one out of every five Egyptians having consumption expenditure below the poverty line, Egypt faces a serious poverty reduction challenge. Recent slow growth and increases in inequality prevented progress on poverty reduction, with poverty mildly increasing in the first half of the 2000s. Economic reforms need to be accelerated to ensure higher growth levels that benefit the poor. At the same time, there is a need for greater analysis to understand the causes for recent increases in poverty, so that inequality does not increase further and reduce the effectiveness of growth for poverty reduction. The increases in poverty and inequality occurred during a period of rising social spending, pointing to the need for improved targeting and greater effectiveness of the social safety net. Consistent with previous reports, analysis of recent data finds that poverty status is strongly correlated with residence in Upper Egypt, residence in a rural area, low educational attainment and work in agriculture or construction. These findings serve as the basis of recommended targeting for the long term development of a comprehensive safety net system (Chapter 2) and for the short term improvement of existing food and energy subsidy programs (Chapter 3 and Chapter 4).

1.18. While the planned Poverty Assessment Report will focus on the growth-inequality-poverty linkages, this report focuses on strengthening the social safety net through improving its targeting and effectiveness. Chapter 2 examines strengthening social safety by improving the targeting methods, exploring options for increasing cash assistance to the poor, and devising programs that support the vulnerable. Chapter 3 addresses options for improving the targeting of the food subsidies, while Chapter 4 addresses the implications of reforming the energy subsidies.

1.19. Several methodologies and sources of information will be used in examining the poverty and distributional impacts of existing and proposed reforms to the social safety net and subsidies. An important source of information includes the budgetary and administrative data from the Ministries of Finance, Social Affairs, Supplies, Petroleum, and Electricity. These data are used to identify the program size, administration and budgetary implications, and any resultant price distortions. The HIECS is extensively analyzed to examine who benefits from various instruments of the social safety net, help identify recommendations for improving the targeting, and examine the direct poverty and social implications of various policy recommendations. While

analysis that relies on the HIECS can capture the direct impacts of some policies and reforms, this analysis is deemed partial in the sense that it does not capture the impacts of reforms on production sectors and the resulting indirect feedback on households. To address the total impact of reforms, a CGE Model is developed and linked to the HIECS. The CGE model is built around a database for FY04, and is disaggregated into 37 sectors and seven primary production factors. It allows an examination of the short-run impacts of different policy options, including the impacts on GOE budget, household welfare, foreign trade, and real exchange rate. The price and income outcomes of the CGE model are fed through the HIECS to produce micro-simulations of the policies on all households, allowing an examination of the social and poverty effects as well. (See Box 1.3; for more detail see Appendix A.)

Box 1.3: Computable General Equilibrium Model and Micro-Simulation of Policy Impact

A CGE Model is built to capture the full impact of policy reforms on households as well as various production sectors, foreign trade, and the GOE budget (see Appendix A for more details). The CGE model is built around a database for FY04, and is disaggregated into 37 sectors and seven primary production factors. It is a real, open-economy, single-period CGE model in the World Bank tradition. Given the focus of the study, the model has the following distinguishing features.

(i) Treatment of subsidies: the subsidies on bread, flour, and energy (petroleum and electricity) products are treated as distorting – unlimited quantities of these commodities are made available at a subsidized price, leading to overuse. However, subsidies via the ration card are not treated as distorting, since the quantities available at a subsidized price are limited and almost all households purchase additional units of similar items at non-subsidized prices. The model captures a leakage of the food subsidies to middlemen as well as the availability of energy subsidies to production sectors and households.

(2) Social transfers are modeled with administrative costs.

(3) Energy supply and demand: petroleum production is assumed fixed, with the GOE absorbing marginal changes in the sector surplus; producer prices are linked to international prices. For electricity, all input uses (factors and intermediates) are determined by fixed coefficients. Producer prices are determined by input prices, including a fixed charge per unit of capital. The price paid by domestic demanders is adjusted when a subsidy is in place. Output is demand-driven – the producer will supply the quantity demanded. Across all activities, energy and non-energy, intermediate input coefficients are price-sensitive; this feature was introduced given that some adjustments would be expected in light of substantial relative price changes between energy and non-energy inputs

(4) Factor and macro closure rules: factor mobility in the model is constrained in the short-run – capital cannot move between different activities and labor cannot move between work in agricultural and non-agricultural activities. At the macro level, real investment spending and the current account balance (in foreign currency) remain fixed.

A policy simulation may involve a particular subsidy cut that may be coupled with a cash transfer program to households. For each simulation, the CGE model feeds a micro-simulation model based on the HIECS (Q1 of FY05), with a set of changes in consumer prices and net incomes (income available for consumption), including the total value of transfers that will be distributed across the households, making it possible to assess the detailed effects on poverty and income distribution of alternative policy schemes. This is the first application of this CGE-micro-simulation approach to Egypt.

CHAPTER 2. STRENGTHENING THE SOCIAL SAFETY NET

While the public social safety net in Egypt provides critical assistance to the poor, collectively the programs are expensive, benefit many more non-poor individuals than poor, and do little to reduce overall poverty. Strengthening the safety net will require: (i) more effective coordination between institutions and efficient program administration; (ii) improved targeting of existing interventions; (iii) establishing a balanced mix of assistance by reducing distortionary subsidies and increasing cash transfers and other complementary programs; and (iv) enhancing the complementary role of communities and the private sector. Through simulation exercises, this chapter explores the potential for efficient poverty reduction from improved targeting of expanded cash transfers and the introduction of new cash-based interventions. This chapter has a dual focus. It examines in detail the existing cash transfer component of the safety net and recommends short term measures for improving targeting. The chapter also recommends the long term development of a comprehensive safety net system, which would improve and expand the existing cash transfer component, complimented with new conditional cash transfer and public works programs. The resources needed for such a comprehensive safety net are assumed to come from the budgets of the existing, but much less efficient, food and energy subsidy programs.

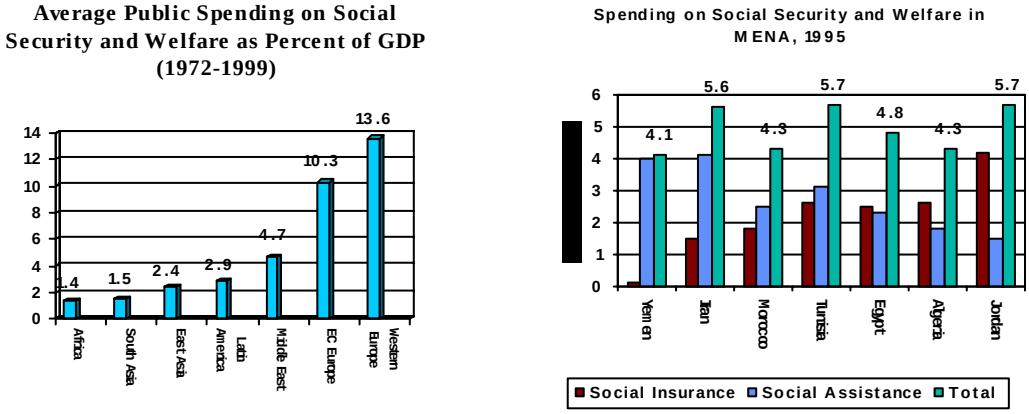
A. RATIONALE FOR REFORMING THE PUBLIC SAFETY NET

2.1. **Reform of the safety net is important for three related reasons.** First, the program elements often don't reach the poor and the benefits are too small to provide meaningful assistance. Second, taken together the programs are very expensive when subsidies are considered. And third, the programs are inefficient, with overlapping beneficiaries and objectives.

2.2. **Egypt's public spending on the safety net, excluding subsidies, is consistent with patterns observed for the MENA region.** Cross-country data showing all elements of countries' safety-net expenditures are not available except for IMF estimates which exclude both subsidies and public works costs. Figure 2.1 shows that general social protection spending in the region has averaged about 5 percent of GDP over the 1972-99 period, significantly below most European countries. In Egypt, a slight majority of the total spending was devoted to social security (mostly contributory pensions). By FY04, Egypt spent about 2 percent of GDP on the safety net, a roughly stable level since FY00.

2.3. **However, when subsidies are considered, the safety net becomes relatively expensive.** The total of consumer subsidies on food, social assistance cash transfers and SFD expenditures is about 2 percent of GDP (see Box 2.1). The economic subsidies to energy products cost an additional 8.1 percent of GDP in FY04 (see Chapter 4). Expenditures at this level, when largely in the form of subsidies, can be highly distortionary and result in inefficient economic decisions that hamper growth. Chapters 3 and 4 discuss food and energy subsidies respectively, and potential reforms in more detail.

Figure 2. 1: Regional Spending Patterns on Social Protection



Note: Figures use IMF definitions. Public expenditure on social security and welfare includes compensation for loss of income to the sick and temporarily disabled; payments to the elderly, the permanently disabled, and the unemployed; family, maternity, and child allowances; and the cost of welfare services, such as care of the aged, the disabled, and children. It excludes expenditures on some safety nets, such as subsidies and public works program costs.
Source: World Development Indicators, various years.

Box 2. 1: What is the Public Social Safety Net?

The public social safety net generally refers to the set of publicly-sponsored programs that provide income or in-kind support and access to basic social services to the poorest and most vulnerable in society. They are distinct from other forms of social protection including contributory social insurance such as pensions, as well as labor market regulations and interventions.

Typical programs in many countries include:

- Cash transfers (also known as social assistance) such as family assistance, noncontributory old age transfers or disability payments;
- In-kind transfers such as food rations and nutrition and feeding programs,;
- Price and tax subsidies for the poor;
- Targeted human-development programs/conditional cash transfers;
- Public workfare;
- Fee waivers for health, education or other basic services.

Egypt spends about 2 percent of its GDP on the core social safety net. It does not have every type of program above, but resources are devoted to [4]:

- Consumer subsidies on food (1.7 percent of GDP);
- SFD programs (0.18 percent of GDP); and
- Social assistance cash transfers from MOISA (0.12 percent of GDP).

The largest share of resources, 8.1 percent of GDP, is spent on energy subsidies to producers and consumers which serve as an important safety net but also absorb resources that could be better directed to the poor.

Sources: MOISA, SFD, and other GOE officials.

[4] Two important social protection programs are not considered here because they do not target the poor: (i) income-generating programs that provide financial credit and in-kind support to the disadvantaged to foster

2.4. **Many of the elements of the safety net are ineffective at reaching the poor, and/or do not provide sufficient benefits to make a difference.** Table 2.1 shows the percentage of poor and non-poor receiving three types of assistance: publicly provided food subsidies, cash transfers and private transfers received from family, friends or non-GOE institutions. Food subsidies reach the majority of both poor and non-poor, with more than 70 percent of the sample receiving subsidy benefits in Q1 of FY05. Conversely, fewer than 12 percent of the poor report receiving cash transfers, while nearly 6 percent of the non-poor report receiving transfers that are supposed to be means-tested. Neither of the safety-net mechanisms is very effective in raising the poor above the poverty level. Private transfers are more effective than either of the public schemes, and social assistance transfers alone raised only 0.6 percent of the poor above poverty in FY05 (about 408,000 individuals), by far the least effective intervention.

Table 2. 1: Incidence and Poverty Impact of Select Safety Net Elements FY05

	Beneficiaries (% of group)		Poverty Impact (% of population lifted out of poverty)
	Poor	Non-poor	
Private transfers	19.3	16.5	7
Social-assistance cash transfers	11.5	5.6	0.6
Food subsidies	73.0	72.0	5

2.5. **The limited effectiveness of social-assistance cash transfers is due largely to the low level of benefits and coverage**. Cash transfer payments from the MOISA provide low benefits amounting to LE 538 per recipient family in FY04 and have a limited coverage of about 1 million families, or about 7 percent of the national population.[5] The average benefit level has declined in recent years, representing slightly more than 8 percent of the poverty line for a family with two adults and three children in Upper Rural Egypt, for example. The benefit is on the low side of the range of international experience, which ranges between 5 and 25 percent of the poverty line.

2.6. **The safety net is fragmented, with several institutions providing uncoordinated assistance to overlapping beneficiaries**. As well as administering the financially much larger social-insurance pension system, MOISA provides cash transfers through three program funds: (i) a so-called social-pension fund for special categories of vulnerable people such as orphans, widows, divorcees and their children, and families of prison convicts; (ii) a temporary assistance fund for pregnant women, those with partial disabilities, emergencies such as medical expenses and school fees, and natural disasters and accidents; and (iii) a fund for families of former low-income GOE employees, covering emergency payments for sickness, education and marriage. (See Box 2.2 on administration of MOISA programs.) In addition, the Nasser Social Bank issues transfers and interest-free loans to poor families for school or medical expenses or cases of personal crisis.[6] And the SFD has focused on micro- and small-enterprise development and infrastructure, but is moving into a new phase focused more toward integrated services for the poor, population and community health, and public workfare. The cash benefits offered by the various institutions are not

entrepreneurship and business development; (ii) social insurance reflected in the pension scheme covered by employer and employee contributions, where the benefits are based on work history.

[5] Benefit levels are based on family size.

[6] The Nasser Bank operates nominally under the management of MOISA, but functions independently as a full-range bank in addition to its social aspects. Nearly LE 50 million was disbursed to poor families as transfers or interest-free loans in FY04.

coordinated and there is little formal cooperation, suggesting that errors of both inclusion and exclusion may be high.

2.7. **There is a need for systematic monitoring and rigorous, outcome-focused impact evaluations to improve safety-net implementation.** There is little information available on program operations, and few systematic formal assessments have been undertaken on the components of the safety net. There have been occasional donor reviews, such as the review of the SFD, which concluded that the social fund overall appears to compare favorably with the costs of well-run social funds. However, more routine data collection and assessments should be undertaken and internalized by policymakers and program administrators.

2.8. **Despite the fragmented approach to the safety net, there are concrete steps being taken to improve performance in some areas**. Policymakers are aware of program deficiencies, particularly with respect to subsidies. For example, a pilot study of the use of smart cards for the ration-card system is underway and could be rolled out nationally within several years, potentially saving the GOE up to 10 percent in administrative costs (see Box 2.3).

Box 2. 2: Administration of Social Assistance Programs

Eligibility for the MOISA social-assistance cash-transfer programs is intended to be means-tested, requiring application at a local MOISA office, supported with documentation including family birth certificates and salary records from employers or pension statements as well as a national identification card. As the eligibility criteria include widowed or divorced housewives, the assistance program transfers more funds to females than males. Initial application is followed up with a home visit by a social worker who completes the application, and an eligibility decision is made within 60 days. Eligibility determination is hampered by the fact that many poor individuals do not possess identification cards and cannot be enrolled.

Cash transfers are administered through 2,500 local MOISA welfare offices. There are another 250 Social District Offices that oversee the local offices, as well as 27 governorate-level offices. MOISA has about 70,000 employees, of which 20,000 are social workers dedicated to cash transfers and in-kind assistance. Information technology and management-information systems are limited. All computerized systems are located in the retirement pensions department, for example, and cross-checking of applicants' incomes and receipt of benefits is time-consuming and must be done through a formal arrangement using the pension database. While no formal analysis of administrative costs is available, this structure suggests relatively high costs, likely above the 5 to 10 percent level typically observed in well-administered cash-transfer programs. Total administrative and capital expenditures for MOISA and the Social Affairs Directorates were LE 1.1 billion in FY04. The figure combines pension and social assistance functions.

2.9. **The remainder of this chapter explores the potential effects on poverty reduction of two approaches toward improving the cash transfer portion of the safety net: better targeting methods, and introducing or expanding conditional transfer programs including public works.** These approaches are not exclusive, and can be used in various combinations. Implementation of one or more elements would entail a range of political economy and operational factors, many of which would require further analysis. Exploring other potentially important administrative or structural changes in the safety net, or the introduction of other program types such as nutrition and feeding interventions or fee waiver options is not undertaken

here. The modest goal is to use simple simulations to assess the possible effects on poverty and transfer efficiency of cash-based interventions.

Box 2. 3: Smart Safety Net in Egypt

The GOE has embarked on a phased multi-year E-Government Project with the twin goals of improving the flow of information between government bodies and complementing government automation and service delivery efforts. Led by the Ministry of Information and Communication Technology with the full cooperation of all ministries, the project intends to bring all government services for citizens online within the next five years and make service delivery, procurement and administration more efficient.

A key component is the use of smart-card technology to improve service delivery. The Ministry of State for Administrative Development is experimenting with the use of smart cards for the access and management of subsidized goods currently available under the ration-card system.

A three-year pilot in Suez governorate involving 85,000 ration cards – some 250,000 people – and 100 merchants associated with five food-supply offices will use smart cards instead of ration cards. Beneficiaries will be issued the cards (about the size of a standard credit card), which contain a variety of information about the household and the available rations for subsidized goods on a microprocessor imbedded in the card itself. The national identification database will be used to incorporate such information as the number of family members, birth and death information, and other eligibility criteria. In conjunction with card readers, the cards will automatically verify the eligibility for the rations and the amounts transferred, and permit accurate payments of food vendors.

It is expected that the smart-card system will decrease costs of ration-subsidy administration, including reducing errors such as multiple ration cards for individual families and potential fraud involving vendors. The current ration card requires about LE 3 for each 1 LE in the value of the subsidies transferred to the poor. It is estimated that the smart-card system can decrease the cost of providing subsidies by 10 percent, implying a savings of LE 400 million annually.

The first evaluation report on the pilot project is expected in October 2005, and pending successful implementation at the conclusion of the pilot, the program will gradually be expanded nationally.

Sources: Ministry of State for Administrative Development, and documents at www.mcit.gov.eg.

B. IMPROVING THE TARGETING AND COVERAGE OF SOCIAL ASSISTANCE TRANSFERS

2.10. **Several methods are considered here for improving the targeting of the public cash transfer program: (i) geographic targeting, (ii) targeting on the basis of electricity consumption, or (iii) proxy-means testing (PMT)**. Improving the targeting of cash-transfer programs – both reaching more individuals who are poor and excluding those who are not – will improve the performance of social-assistance programs markedly. This will allow the same resources to reach a larger poor population. Moreover, the GOE may wish to expand existing cash-assistance programs to provide better coverage and more adequate assistance. Three options for expanding the cash-assistance program are considered here: maintaining the current transfer budget but using alternative targeting methods; doubling the current budget to LE 1.0 billion; or expanding the cash-assistance program to LE 3.0 billion. The latter two options may be envisioned with a reform of food and energy subsidies; this would free resources for an expanded transfer program. Detailed discussion of the simulation procedures can be found in Appendix B.

2.11. **These targeting methods have been used with success in Latin America, Europe, Central Asia, and elsewhere to help improve the coverage of the poorest and reduce program operating costs.** We examine the individual targeting results in more detail below. For each targeting method and for each of the three budget scenarios, Table 2.2 presents the poverty rates, depth of poverty, and cost efficiency as measured by the cost of transferring LE 1 to the poor.

2.12. ***Geographic targeting*** **as simulated does not outperform the current targeting system in overall poverty reduction, but reduces poverty in the poorest regions**. If the existing resources devoted to public social-assistance cash transfers were allocated to regions in proportion to their share of the poor population, and are then distributed uniformly to every resident (poor or not), poverty would decrease in the Upper Rural region compared to the current transfer targeting. However, poverty would increase slightly in the other regions, implying that the overall poverty rate would be 0.1 percentage point higher than under the current system, although poverty would decline by 0.5 percentage points relative to the pre-transfer poverty rate (Table 2.2). The depth of poverty would also be slightly higher with geographic targeting, as scarce benefits would be spread too widely to have an impact.

2.13. **A more refined geographic targeting approach is promising for poverty reduction, and Egypt already has the necessary administrative infrastructure and data capacity**. As budgets increase, targeting performance improves with the geographic approach. Geographic targeting improves upon the current method when the budget is LE 3 billion; when the budget is LE 10 billion, geographic targeting is superior to all other methods (see Appendix B.). With very large budgets and wide distribution, all poor individuals effectively receive benefits and for many this is sufficient to lift them above the poverty line. Other methods do not do as well at larger benefit levels because they do not reach as many of the poor.

2.14. **The level of targeting categories can be refined further than reflected in the simulations in Table 2.2 by the use of a poverty map that identifies the poorest governorates, districts, or smaller areas based on nationally representative data.** Given that more than half of Egypt's poor live in the Upper Rural region, refined geographic targeting can be expected to help alleviate the most severe poverty. Egypt regularly conducts the Household Income, Expenditure and Consumption Survey (HIECS), and in fact the SFD already uses a very basic poverty map to guide project decisions that they are planning to improve. The extensive national network of MOISA welfare offices and tradition of home visits, along with the data-collecting experience of the CAPMAS, suggest that a geographic targeting system could be applied successfully.

2.15. **Targeting using *electricity consumption* outperforms current targeting methods, but is dominated by methods that rely on several correlates of poverty**. Given that electricity consumption increases with income, there is a proposal of using the household electricity bill to identify the poor from the non-poor. The simplicity of using a single proxy for poverty status is appealing from an administrative point of view. The simulation gives equal benefit amounts to all individuals whose per capita electricity consumption is within the bottom quintile of the sample. With the existing budget, this results in a slight improvement in poverty reduction over the current method (0.1 percentage point) as well as an improvement over the poverty estimate with geographic targeting (0.2 percentage points). The depth of poverty, as measured by the P1 index, deteriorates as compared with the current method or alternatives. Research has suggested that the use of only one

or two variables does an inferior job of distinguishing the poor from the non-poor relative to other methods involving a more complete set of variables.[7]

Table 2. 2: Poverty Rates and Transfer Efficiency
With Geographic and Proxy-Means Targeting

	Current Budget (LE 554 million)			Double budget (LE 1.1 billion)			Larger Budget (LE 3 billion)		
Poverty rate with no social-assistance transfers = 20.2	Poverty rate	Poverty depth (P1)	Cost per LE to poor	Poverty rate	Poverty depth (P1)	Cost per LE to poor	Poverty rate	Poverty depth (P1)	Cost per LE to poor
Current transfers and targeting	19.6	3.87	4.39	18.9	3.66	4.31	18.3	3.56	3.73
Geographic targeting	19.7	3.91	4.00	19.1	3.71	3.71	16.8	3.00	3.56
Electricity consumption	19.5	4.07	3.14	18.8	4.04	3.01	16.4	3.67	2.94
Proxy-means targeting (PMT)	19.4	3.70	1.95	18.6	3.30	1.78	14.6	2.25	1.67
Geo + PMT, regional distribution	19.3	3.76	2.01	18.6	3.40	1.83	15.2	2.40	1.72

Notes: P1 is the Foster Greer Thorbecke measure of poverty depth; see Box 1.2.

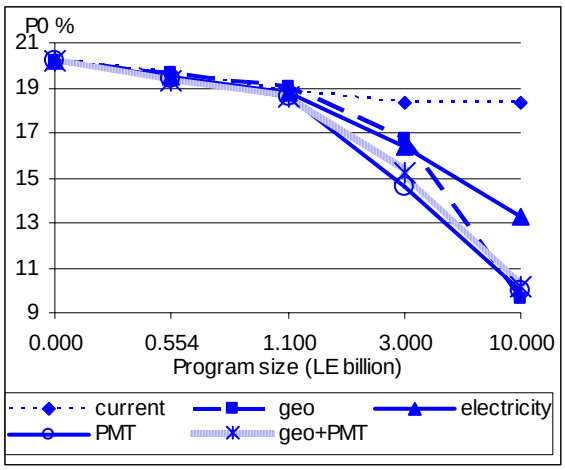
- Geographic targeting allocates budget to regions based on proportion of poor individuals residing in the region, then gives each person an equal share of regional resources. Administrative cost for targeting is assumed to be LE 50 million.
- Targeting based on electricity use allocates the budget to poor individuals in the lowest quintile of electricity consumption. Administrative cost is assumed to be LE 44.3 million.
- Proxy-means targeting provides the national per-capita transfer level to each eligible individual under the proxy-means test. Administrative cost for targeting is assumed to be LE 64.2 million.
- Geographical + proxy-means first allocates budget to regions proportionally to poverty, then provides the regional per-capita transfer level to each eligible individual under the proxy-means test. Administrative cost assumed to be LE 64.2 million.

Source: Bank staff calculations based on CAPMAS, HIECS FY05-Q1

2.16. ***Proxy-means testing*** **relies on several correlates of poverty for identifying the poor and can potentially produce large improvements in poverty outcomes.** The approach uses available information on households to systematically assess their eligibility for benefits based on need, represented by an approximation or proxy of household income or expenditure.[8] With the current budget for cash assistance and with targeting using proxy-means testing (PMT), poverty is 0.8 percentage points lower than the pre-transfer poverty rate, 0.2 percentage points lower than the current targeting approach, and 0.1 percentage points lower than with targeting using electricity consumption. The cost per LE transferred to the poor is less than half the current method, and the depth of poverty is 4.4 percent lower.

[7] See Grosh and Baker (1995) and Ravallion and Chao (1989) for a discussion of various proxy-means approaches.
[8] Appendix B describes the PMT simulation procedure.

Figure 2. 2: Poverty Reduction with Transfer Size by Targeting Method



2.17. Several features are important to note about the application of proxy-means testing and the simulation:

- Results of PMT vary by region. The largest effect is concentrated in the Upper Rural region, where poverty would decline by about 1 percentage point using PMT compared with the current targeting system. Poverty would drop slightly in the Upper Urban and Lower Rural regions, but would increase in the Metropolitan and Lower Urban regions.
- Despite the added cost of administering the PMT, it outperforms the current targeting and other methods because of increased precision. In addition to nationally representative household data, PMT requires individual household assessment, usually with a verification procedure involving household visits. Total costs vary widely depending on program size, geographic coverage and intake procedures, although costs have generally not been vastly more than geographic targeting.[9] The annual cost of implementing a PMT in Egypt is assumed to be about LE 65 million.
- Often, geographic and proxy-means testing are used together to improve targeting performance and lower administration costs. For example, many conditional cash-transfer programs in Latin America use a combination of the methods, as in Mexico (Box 2.4). In the simulation, combining the two methods yields a poverty rate of 19.3 percent, close to the PMT, with a slightly higher cost per person lifted out of poverty. As budgets increase, performance increases, although not as quickly as PMT alone. This may be due to the coarseness of the geographic allocation, as noted above.

2.18. **Three general conclusions follow from the simulation analysis.** First, maintaining the current low level of transfer resources will do little to affect poverty, regardless of the targeting method employed. Benefit levels should be increased if public cash transfers through MOISA are to be effective. Second, the new targeting methods perform impressively at higher budget levels. And third, PMT is superior at all levels of budget except for the largest scenario in which geographic targeting emerges as the preferred method.

[9] Little information is available on the costs of targeting in MENA countries. See Castaneda *et al.* (2005) for a discussion of targeting costs in the Latin American context.

2.19. **Raising benefit levels is critical to reducing poverty through cash transfers.** As the budget increases, the transfer amount going to beneficiaries increases, raising more individuals out of poverty and lessening the depth of poverty under all targeting methods. Figure 2.1 demonstrates that poverty rates remain relatively stagnant at low budget levels regardless of the targeting approach. The current cash-transfers programs disbursed 0.12 percent of GDP to slightly over 1 million families in 2004. This translates into just over US $20 per beneficiary, or about 8 percent of the poverty line for a family of five in Upper Rural Egypt. Other middle-income countries with successfully targeted cash-transfer programs – for example, in Latin America – tend to devote greater resources and give higher benefits. Brazil has a similar poverty line and allocates a very similar 0.13 percent of its GDP to the Cadastro Unico program, but provides each beneficiary with US $46 on average. Some programs offer US $100 or more. While experiences elsewhere do not provide a foolproof guide and local conditions vary enormously, they do suggest that raising benefit levels should be considered in Egypt if cash transfers are to be an important mechanism to alleviate poverty.

2.20. **At higher transfer levels, the new targeting approaches decrease poverty far more than the current method.** At the present low level of resources, the relatively high fixed costs of setting up targeting registries and collecting and maintaining data may not appear to justify the small reductions in poverty. Yet even in the current budget scenario, both overall poverty and the depth of poverty can be reduced while improving efficiency in terms of cost per LE transferred to the poor. As budgets increase, with a tipping point somewhere above LE 1.1 billion, the improved targeting methods pay off more strikingly.

2.21. **Proxy-means testing is a superior targeting method at the current program size or with modest expansion.** Pure PMT performs the best in terms of poverty reduction and transfer efficiency with the currently available budget or with modest expansion to LE 3 billion. Considering the current transfer budget of LE 554 million, PMT is the most effective and efficient, followed by the combined geographic and PMT targeting approach. With a doubling of the current budget to LE 1.1 billion, PMT would reduce poverty 1 percentage point below existing transfers and targeting method. If the budget were raised to LE 3 billion, achievable by reducing in-kind subsidies, PMT could reduce the poverty rate to 14.6 percent, lifting some 3.8 million individuals out of poverty as compared with the current scheme. The method would cost LE 1.67 per Egyptian pound transferred to the poor, the most efficient of all methods considered.

2.22. **Geographic targeting emerges as the preferred method at very large program sizes**. With a substantial budget of LE 10 billion, or about 2.2 percent of GDP, the geographic approach performs the best of the methods considered in terms of poverty reduction and transfer efficiency (shown in Appendix B). This is explained by the fact that the benefit levels would be sufficient to raise virtually everyone above the poverty line given the universal coverage. PMT and combined geographic/PMT targeting would both reduce poverty to just over 10 percent of the population, but with a relatively high cost per person raised out of poverty.

2.23. **A well-balanced safety net consists of programs with objectives beyond the redistribution of cash, helping to directly enhance growth prospects among the vulnerable and poor**. While poverty reduction can be achieved with improved targeting and larger budgets devoted to transfers, there is a need to balance the possible reduction in poverty with the potential

effects of alternative uses of the resources, including tax relief, investments, or other safety-net interventions. Public works programs and CCTs deserve consideration within this context.[10]

C. PROVIDING CASH ASSISTANCE AND STRENGTHENING INFRASTRUCTURE

2.24. **Is a *labor-intensive public works program* right for Egypt?** To the extent that unemployment among the able-bodied is significant – in Egypt, the unemployment rate among youth aged 15-25 is 35 percent – and small to medium-scale infrastructure is needed, public works can be a reasonable option. Public works can be very effectively targeted if wages are set at or below the prevailing minimum regional wage rates, ensuring that only those most in need without alternative private sector alternatives will participate. The programs can be scaled up and down quickly and can respond well to shocks such as agricultural price fluctuations and regional employment changes. Egypt has had extensive experience with infrastructure projects through the SFD.

2.25. **The SFD has a lengthy record of administering public works.** From 1992-2004, SFD financing generated LE 1.6 billion in addition to local contributions for infrastructure and public works, creating an estimated 300,000 person-months of temporary employment. However, projects were oriented much more to the creation of infrastructure than employment and income smoothing. Less than 30 percent of the budget was spent on labor. SFD is entering a new phase of operation in which it is expected that public works projects will be more focused on labor-intensive projects with wages set below local market rates to encourage self-selection of the able-bodied poor. With more effective implementation, the GOE may want to consider scaling up the program using the existing institutional arrangements of the SFD.[11]

2.26. **The simulated *public works scheme* compares favorably with the current transfer scheme in terms of poverty reduction and efficiency.** Workfare programs do not create permanent employment, but can provide temporary income when vulnerable individuals are confronted with adverse employment shocks. They can be scaled-up rather quickly in times of crisis or economic downturns, and they lend themselves to being targeted to specific areas of high poverty with high unemployment. The estimated effects on poverty of converting the current safety-net transfer budget into a public works program targeted to the Upper Rural region is shown in Table 2.3. Assuming that 50 percent of the budget is devoted to labor, and that a three-month job is provided to every participant at the rate of LE 350 per month, temporary jobs for more than 265,000 people would be created on an annual basis (nearly 20 million work days).[12] This scheme would reduce poverty in Upper Rural Egypt by 2.3 percentage points, and overall poverty by 0.3 percentage points, compared with the current system of transfers. Public works would also be less costly in terms of reaching the able-bodied poor, costing LE 2 for each LE 1 given to the poor.

[10] Programs such as public works and CCTs are not likely to be direct substitutes from the recipients' perspective for unconditional transfers or universal subsidies. These interventions have a smaller eligible population (e.g., able-bodied individuals of working age; poor families with children) and require specific actions on the part of beneficiaries, whereas subsidies apply generally and require no special actions from users.

[11] The design of the Social Fund IV donor-supported project is currently underway with the GOE and SFD authorities.

[12] Wages are based on the public-sector minimum wage. Rates could differ by region; for example, the daily wages paid by the SFD in a governorate in the Upper Urban region were between LE 12 and 18 in 2003.

D. PROVIDING CASH ASSISTANCE AND BUILDING HUMAN CAPITAL

2.27. **Is a *conditional cash-transfer program* right for Egypt?** Conditional cash-transfer (CCT) programs provide cash to an individual or family to encourage specific human development, with regard to either health or education, or perhaps to encourage vocational skills development. Box 2.4 notes some of the pre-conditions for successful implementation and describes the growing use of CCTs in Latin America and elsewhere. CCTs are not a panacea for poverty. They are administratively complicated and require good targeting, data, and enforced conditionality. Additional analysis of the feasibility and implementation options would be needed before an informed judgment can be made about the desirability of CCT for Egypt.

2.28. There are several features of CCTs which may have advantages in terms of design and political economy. First, because of the conditionality requirements, the program imposes a degree of self-selection and a regulated flow of participants through the system. Only families with children between specified ages are eligible for benefits, limiting the size of the program to predictable levels. This fact also often increases the political palatability of the program, focusing resources on the most highly vulnerable segment of society – children. In many programs, cash benefits are transmitted directly to mothers. Research suggests that often women are more inclined to use cash wisely for the benefit of children and the family, possibly also helping to empower them within the household. Finally, some CCTs have shown increased human capital development among recipient families, with implications for long term improvements in poverty reduction.[13]

Table 2. 3: Poverty Rates and Transfer Efficiency
With Hypothetical Public Works and CCT Programs

Poverty rate with no social-assistance transfers =20.2	Poverty rate	Poverty depth (P1)	Cost per LE to the poor
Current transfers and targeting	19.6	3.87	4.39
New public works	19.3	2.22	2.01
New CCT program	19.3	3.80	2.11

Notes: P1 is the Foster Greer Thorbecke measure of poverty depth; see Box 1.2.

- Public works assumes 50 percent of budget devoted to labor for three-month jobs, each paying LE 350 per month.
- CCT assumes 10 percent administrative costs, and 5 percent of population is covered with 70 percent of benefits going to the bottom two quintiles of the population.

Source: Bank staff calculations based on CAPMAS, HIECS FY05-Q1

2.29. **Egypt may benefit from a program to stimulate targeted demand for education and health services.** Poor children remain disproportionately affected by low educational outcomes such as low school attendance, and higher repetition and dropout rates. Of all children between 7 and 11 years old not attending school, fully half are from the poorest quintile. Similarly, health indicators among the poor remain low. For example, the infant mortality ratio in Rural Upper Egypt is more than double that of the urban governorates, and immunization coverage of the richest quintile is almost 1.5 times higher than that of the poorest quintile.

[13] Recent research on the Mexico CCT suggests that the cash transfers may increase households' ability to make income-generating investments, thereby raising longer term living standards (Gertler, Martinez and Rubio 2005).

2.30. In addition, primary education and basic health facilities are accessible to many of the poor. The GOE has embarked on a major school construction program over the last few years, now largely complete. By the late 1990s, it was estimated that primary education was accessible to 99 percent of all villages.[14] Similarly, the country has invested heavily in health service infrastructure and basic public health programs. However, there remain large inequities in accessibility and quality of health care services. It is not clear how applicable CCTs would be for longer-term health outcomes in Egypt without further supply-side progress, however many countries have combined CCTs with supply-side initiatives (see Box 2.4).

2.31. **A *conditional cash-transfer program* could reduce poverty compared with the current transfer scheme, in addition to helping poor children build their human capital**. In Egypt, if the current transfer budget of LE 554 million were converted to a CCT targeting families with children younger than 15 years, assuming typical coverage and administrative properties, the poverty rate would be lowered to 19.3 percent on the basis of the transfer alone (Table 2.3). Additionally is expected that the longer-term human-capital effects represent a significant value of CCT interventions, although these are not estimated here.

Box 2. 4: Conditional Cash Transfer Programs (CCTs)

Definition. Conditional cash transfer programs (CCTs) are a relatively new instrument that seeks to foster human capital development. Cash is provided to families conditional on behavioral changes, often including keeping children in school and maintaining health regimes. The cash helps reduce poverty in its own right, compensates families for the opportunity cost of changing behavior, and is expected to contribute to long-term human capital development for the young. They operate by stimulating demand for existing social programs, implying that the lack of human development among the target group should be an identifiable problem. Some of the programs provide the cash to the adult female, in line with international evidence of greater developmental effectiveness of female-managed transfers. Successful implementation requires several elements:

-- *Accessible human development institutions.* Schools need to be accessible by the poor, and the quality of education should be sufficient to convey benefits. Basic health care must be available. Requiring regular medical visits for young mothers is a useless condition unless reasonable quality care is within reach of the village. Some CCTs have simultaneously strengthened services. Nicaragua provides a bonus to teachers and gives funds to help pay for school materials; Mexico sets aside resources for the additional equipment and medicines needed to meet increased health services demanded; Honduras has provided grants directly to schools and health centers in combination with CCT conditionalities.

-- *Good targeting*, focusing on vulnerable families with children. Many programs have had success using geographic targeting coupled with proxy-means testing;

-- *Program entry and exit conditions that are well known and enforced*. Families that do not meet conditions or do not qualify should be excluded to ensure that sufficient benefits reach the needy and to align participation incentives. and

-- *Adequate administrative capabilities*, especially at the local levels, including the ability to monitor conditionalities and overall program performance.

Use. CCTs have seen increasing application in Latin America and are becoming popular elsewhere, including Turkey and West Bank and Gaza. In several cases, CCTs have also been a means to consolidate disparate cash transfer programs into more efficient, effective targeted interventions to support human capital formation. Jamaica brought together the former food stamps and social assistance programs and replaced them with CCT, while Mexico replaced the tortilla subsidy with a CCT. Brazil has consolidated four cash transfer programs into

[14] El-Saharty, Richardson and Chase (2005).

the *Bolsa Familia* program, creating the largest CCT in the developing world.

Impacts. CCTs have become more popular in part because of the impacts they have achieved, demonstrated through rigorous monitoring and evaluation. Impressive gains in education, health, and consumption have been recorded in Latin American programs such as Mexico's and Nicaragua's:

	Nicaragua RPS Program Impact
Education	
Percentage of age-appropriate children in primary school	+ 21.7%
Health	
Percentage of children under 2 with complete immunization	+ 18.3%
Consumption	
Per capita annual food expenditure	+ N$ 753

Sources: Rawlings and Rubio (2004); Ayala (2003).

E. CONCLUSIONS

2.32. This chapter recommended short-term measures to improve the targeting of the existing cash transfer program as well as long term development of a comprehensive safety net (incorporating CCT and workfare programs in addition to an expanded cash transfer program). This chapter has assumed that the funding for the comprehensive safety net would come from the existing budgets of the food and energy subsidy programs, which are discussed in Chapter 3 and Chapter 4, respectively.

2.33. In order to examine the impacts of the policy recommendations, several simulations have been conducted. These simulations are meant to be illustrative, and cannot be taken as accurate point estimates of the impacts of targeting methods or of the effects of adopting new programs; however, the results do suggest that the program options deserve serious consideration and further analysis of potential viability. Several general conclusions emerge from this preliminary examination, consistent with and building on earlier work.[15]

These include:

- *Streamline institutional coordination and program administration*. A thorough analysis is needed of existing safety-net mechanisms, including the institutional mandates, overlap of beneficiaries, administrative procedures, and the effectiveness of current programs. These programs have accrued over time with successive pieces of legislation. There is a need for a strong program monitoring system and coordination between different agencies, including coordination with the SFD and NGOs. In addition to coordination, the number of the staff of many programs suggests that administration may be able to operate more effectively with a lower cost;
- *Improve geographical coverage and targeting of existing cash-transfer programs*, possibly through the use of geographic targeting or proxy-means testing. Simulations suggest that with the current transfer, budget poverty could be reduced by 0.3 percentage points (204,000 individuals) below the current targeting approach using geographic

[15] World Bank and Egypt Ministry of Planning (2002), and World Bank (2004).

targeting with a proxy-means test, yielding a further reduction in the depth of poverty and improved efficiency;

- *Consider raising the level of benefits to revised social assistance programs*. Simulations point to a reduction in poverty of up to 5 percentage points compared to the current level if a proxy-means test is used in conjunction with an expanded budget of LE 3 billion. Even with just double the budget, poverty could be brought down and efficiency improved over what would be possible with the current targeting approach. The efficiency of all considered approaches improves upon the current targeting system as budgets increase;
- *Consider introducing programs in the medium term to maintain human capital and infrastructure.* Public works and CCTs have the possibility of both lowering poverty compared to the current transfer system and contributing to the development of long-run human capital and infrastructure; and
- *Enhance the role of communities and the private sector in the provision of safety nets.* While not analyzed in this chapter, non-public sources of safety nets have the potential to reach the poor effectively, and can complement a well-targeted public system. Private transfers have in fact raised more people above the poverty line than other transfers in Egypt. Communities can also serve as partners in identifying the poor and monitoring program implementation.[16]

[16] See for example McLeod and Tovo (2001) on community-based social service provision and Conning and Kevane (2001) on community targeting approaches.

CHAPTER 3: IMPROVING THE TARGETING OF FOOD SUBSIDIES

Food subsidies are the main component of the Egyptian safety net, with an estimated financial cost of 2 percent of GDP in FY05. However, the system is ineffective, as one-quarter to one-third of the poor do not benefit from it, despite clear need. In addition to being ineffective, the system is highly inefficient, spending significantly more to deliver benefits to the poor than most comparable programs in other countries. The main reason for this high cost is the inadequate targeting of food subsidies, a large part of which go to wealthier households. Much can be done to improve food-subsidy targeting: geographic targeting to focus distribution on locations with high concentrations of poor households could improve the effectiveness and efficiency of subsidies on bread/flour and ration-card subsidies could be improved by revising the eligibility criteria, actively enforcing compliance and increasing the distinction between low- and high-subsidy ration cards. Implementation of these recommendations could dramatically improve the benefit to the poor with very little negative impact on the wealthy. In the longer term, if the GOE were to develop a comprehensive targeted safety net, the food subsidies could be phased out entirely.

A. RATIONALE FOR REFORM

3.1. **There are three important rationales for reforming the food-subsidy system: the ineffectiveness, cost and inefficiency of the current system.** Many poor and vulnerable households are not reached by food subsidies, and the subsidies contribute only minimally to the consumption of those they do reach. The food-subsidy scheme is the major component of the social safety net, with a financial budgetary cost of 1.7 percent of GDP (LE 7.7 billion) in FY04; this is projected to increase to 2.1 percent of GDP (LE 11.8 billion) in FY05.[17] The food-subsidy system is highly inefficient, spending significantly more to deliver benefits to the poor and vulnerable than most comparable programs in other countries. The main reason for this high cost is the inadequate targeting of food subsidies, much of which goes to wealthier households.

The effectiveness of the food-subsidy system in reaching the poor and vulnerable, and in increasing their consumption, could be improved.[18]

3.2. **Subsidies do not reach many poor and vulnerable households.** Figure 3.1 shows that a significant proportion of the poor and vulnerable are not reached by any of the food subsidies. A quarter of the poor are excluded from the baladi[19] bread subsidy (i.e., do not purchase the baladi bread), the vast majority of the poor are excluded from 10-piaster bread subsidies, and more than a third of the poor are excluded from ration-card subsidies (i.e., they

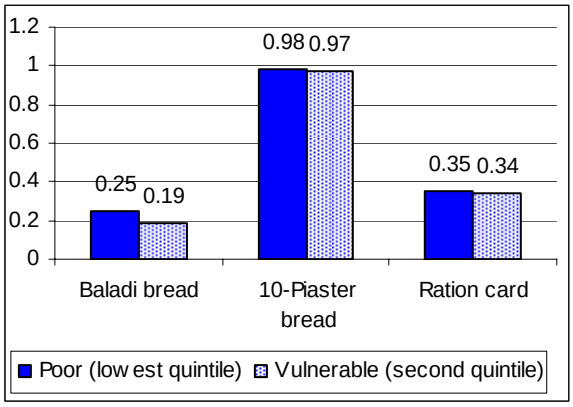
[17] The financial cost of food subsidies to the budget that is calculated according to data from the Ministry of Supply and Internal Trade, is quite similar to their economic cost, since the Ministry accounts for the resources used for theses subsidies. Hence, reference will be made only to "subsidies" in this chapter.

[18] Three different groups in the population are distinguished: the poor, the vulnerable and other Egyptians. The poverty line – and therefore who qualifies as poor – has been described in Chapter 1 of this report. Because "the poor" coincides closely with the lowest expenditure quintile, the terms are used interchangeably for simplicity of presentation. The vulnerable are defined as the second quintile. Thus, the term "the poor and vulnerable" refers to those whose consumption is in the bottom 40 percent of the population.

[19] Baladi bread is also referred to as five-piaster bread. The 10-piaster bread is also referred to as refined baladi bread.

do not hold ration cards).[20] The corresponding percentages for the vulnerable are quite similar. Given the fact that consumer subsidies represent the largest safety net for the poor and vulnerable, this indicates that a significant portion of the target population is not reached by the GOE safety nets, despite their clear need.

Figure 3. 1: Percentage of Poor and Vulnerable
Who Are Not Reached by Food Subsidies

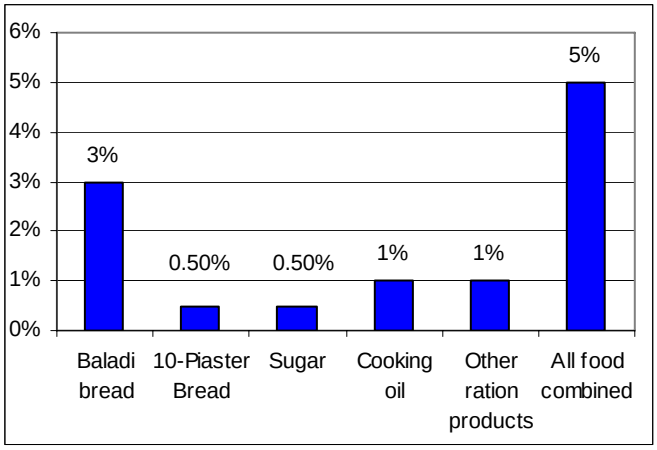


3.3. **Even those poor and vulnerable households who benefit from the food subsidies receive amounts that are insufficient to raise them out of poverty.** The poverty-reduction impact of food subsidies is very small – only 5 percent of the population is lifted out of poverty as a result of transfers through subsidies (see Figure 3.2). The principle reason for the low impact of food subsidies is that the size of the transfer is small. On average, a poor person receives the equivalent of 9 LE per month through the food subsidies, accounting for only 8 percent of total consumption expenditure. Baladi bread accounts for slightly more than half of the food-subsidy transfer received by the poor.[21]

[20] In addition to baladi bread, 10-piaster bread and the ration items, subsidized wheat flour is sold directly to households in some parts of Egypt. Available data do not permit calculation of the percentage of the population at a national level which benefits from this subsidy. The MOSIT/WFP "Vulnerability and Food Subsidy Study Phase I", indicates that relatively few households report purchasing subsidized wheat flour, and that the availability of subsidized wheat flour is skewed toward urban (wealthier) parts of Lower and Upper Egypt, rather than the rural (poorer) parts: according to the MOSIT/WFP study, urban households are more than twice as likely as rural households to purchase subsidized wheat flour in the sampled Lower and Upper Egypt governorates. It is also known that the budget allocated to distribution of subsidized flour directly to households comprises a very small share of the budget for subsidized wheat products (estimated from MOF and MOSIT data at less than 10 percent), implying that the large majority of the poor are excluded from flour subsidies, and that the benefits received by recipient households are small.

[21] As indicated above, the benefits received from purchases of subsidized wheat flour directly by households are very small (as measured by the budget allocation) and are unlikely to raise a significant percent of households out of poverty.

Figure 3. 2: Percent Lifted Out of Poverty by Food Subsidies



The food-subsidy system is the main social safety net instrument, costing 1.7 percent of GDP (LE 8.2 billion) in FY04; this is projected to increase to 2 percent of GDP (LE 10.9 billion) in FY05.

3.4. Subsidy rates vary widely by product (see Table 3.1). At one end of the spectrum, consumers pay only 20 percent of the cost of cooking oil, while at the other end, consumers pay 9 percent more for ration tea than the GOE pays to purchase it. (In this way, sales of ration tea help offset GOE spending on subsidizing other food items.) The table below shows the subsidy rates for each item, along with the quantity households can purchase at the subsidized price. The subsidy rates on sugar and cooking oil depend on whether the household holds a high-subsidy or low-subsidy ration card.

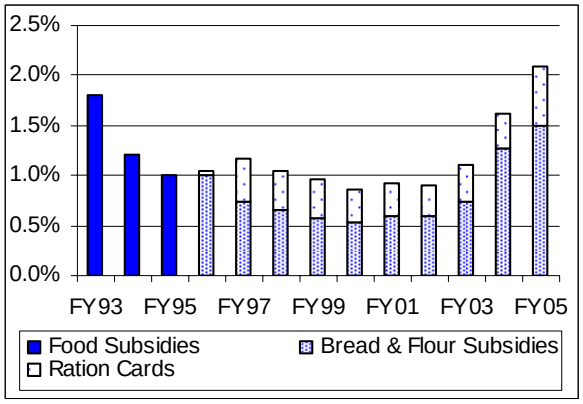
Table 3. 1: Subsidy Rates for Individual Food Items

	Quantity per month (kg)	Subsidy rate
Baladi bread	Unlimited	67%
10-Piaster bread	Unlimited	47%
Subsidized fino bread	Unlimited	47%
Subsidized wheat flour	Unlimited	66%
Sugar	1/indiv.	64% (high); 49% (low)
Oil	0.5/indiv.	90% (high); 85% (low)
Additional oil	0.5/indiv. Up to 4 indiv./family	64%
Tea	0.05/indiv.	-9%
Ghee	0.5/indiv. Up to 4 indiv./family	18%
Beans	0.5/indiv. Up to 4 indiv./family	36%
Lentils	0.5/indiv. Up to 4 indiv./family	20%
Rice	1/indiv. Up to 4 indiv./family	59%
Pasta	1/indiv. Up to 4 indiv./family	36%

3.5. Food subsidies represent a significant portion of the budget. In FY04, the GOE spent 1.7 percent of GDP on food subsidies (LE 8.2 billion) – and is expected to spend about 2.0 percent of GDP (LE 10.9 billion) in FY05. Years of gradual reductions in spending on food subsidies have been reversed in the past year. Starting in 1981, a series of gradual reforms were made to the food-subsidy system, including reductions in the number of rationed items, attempts to reduce the number of ration-card holders, and increases in the prices of bread products.

Spending on food subsidies was thereby reduced from 1.75 percent of GDP in FY93 to only 0.8 percent of GDP in FY99. Reductions in spending on food subsidies have reversed dramatically in the past 18 months – due to an increase in the international price of wheat, exchange-rate depreciation, and the increase in the number of items covered from two to eight. (See Figure 3.3 and Box 3.2 for more details.)

Figure 3. 3: Cost of Food Subsidies
(Spending on Food-Subsidy Programs as a Percentage of GDP)



Note: Figures for FY04 and FY05 do not include arrears repayment or debt associated with food subsidies. In FY04, for example, debt/arrears repayment was 0.11 percent of GDP. Available data for FY93-FY95 do not differentiate spending by product.

The food-subsidy system is inefficient and poorly targeted as a safety net.

3.6. **The cost to deliver $1's worth of benefit is very high by international comparisons and has risen in recent years.** Table 3.2 shows that the cost of delivering $1 of food benefit to the poor is considerably higher than the cost in food-based safety nets in other countries. Even comparing the cost in Egypt today with the same program in 1997 shows a decline in the efficiency with which the food-subsidy program operates. There are two aspects to the inefficiency: the large amount of resources going to households that are not poor or vulnerable, and the large amount spent on distribution costs. As information is not available on the second of these, analysis here focuses only on the first.

Table 3. 2: Efficiency of Food Programs

Egypt	**Cost to deliver $1.00 subsidy to the poor**	
	1997	FY05, Q1
Food subsidies		
Baladi bread	2.98	5.2
10-piaster bread		46.42
Ration sugar	3.34	4.99
Ration cooking oil	4.64	5.23
Food items added in 2004:		
New ration food items		5.08
International Comparison		
Country/Program	**Cost to deliver $1.00 subsidy to the poor**	
The Philippines		
Pilot food price subsidy scheme, 1984		1.19
General rice price subsidy, 1992		5.98
Brazil		
Food subsidy (PINS), 1980		1.21
Preschool feeding and nutrition education, 1980		2.38
Columbia		
Food subsidy, 1981		1.58
Indonesia		
Feeding program, 1982		2.48
Tamil Nadu, India		
Weighing and feeding, 1982		1.74
Bangladesh		
Vulnerable group development program, 1992		1.62
Food for work program, 1982		2.44
Food for education program, 1994		1.59
Rural rationing program, 1992		6.55

Sources: For Egypt, the 1997 data is taken from the IFPRI 2001 report. FY05-Q1 computations are calculated on the basis of HIECS. Data for other countries is taken from Table 6.13 in the IFPRI 2001 report[22].

3.7. **Much of the resources of the food-subsidy system go to households that are not poor or vulnerable.** Indeed, the wealthiest Egyptians (the top quintile) receive 21 percent of the value of baladi bread subsidies, nearly three-quarters of 10-piaster bread subsidies and 20 percent of ration item subsidies (see Figure 3.4). These findings are confirmed by the Ministry of Supply and Internal Trade/ World Food Programme (MOSIT/WFP) "Vulnerability and Subsidy Study Phase II."[23] Taken as a whole, fully 83 percent of the value of food subsidies goes to non-poor

[22] For FY05, Q1, the cost of delivering $1 of subsidy to the poor is computed as the ratio of the total absolute subsidy received by all households divided by the total subsidy going to the poor.

[23] According to the MOSIT/WFP study, "ration card ownership is spread evenly across all income classes, with no significant differences between poorer and wealthier households" and "there is no statistical difference in the percentage of households that regularly purchase baladi bread based on their income."

households. This implies that an enormous amount of public resources is being spent on transfers to wealthier Egyptians – resources that could otherwise be available to reduce poverty and assist the vulnerable. The share of resources going to the non-poor is far higher in Egypt's food-subsidy program than in comparator programs (see Table 3.3), even including programs in middle-income countries, which are better able to afford it.

Figure 3. 4: Distribution of Resources of Food Subsidies
(Percentage of the Value of Assistance Received by Each Quintile)

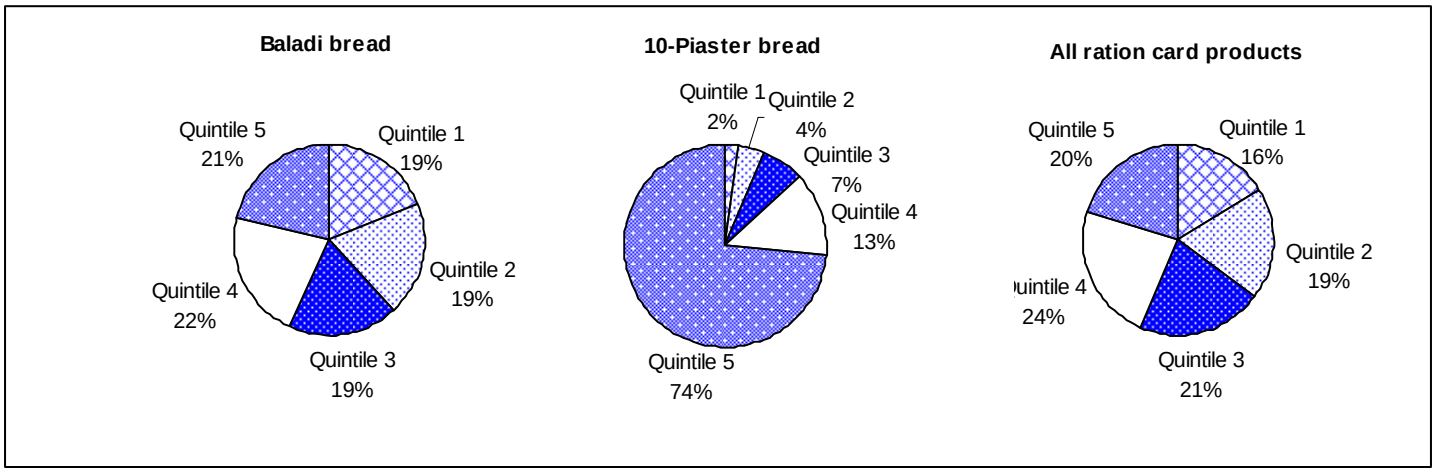


Table 3. 3: Leakage by Value
(Percent of Value of Assistance Received by Non-Poor)

Serbian Family Assistance	22
Sri Lanka (means tested food stamps)	31
Chile Cash Assistance	35
Mexico	41
Romanian Minimum Income	43
WBG Emergency Assistance	44
Kazakhstan Targeted SA	44
Kyrgyzstan Unified Monthly Benefit	46
Armenian Family Poverty	49
Columbia Social Assistance	63
Poland	74
Bangladesh (geographically targeted food)	74
Russian Social Assistance	78
Bulgaria	81
Egypt food subsidies	83
Egypt electricity subsidy	76
Egypt petroleum subsidies	87
Egypt social safety net	76

Sources: Subbarao (1997), PCBS and World Bank (2004a), World Bank (2004b). Subbarao, K., *et al.* (1997).

This finding implies the wealthiest quintile receives approximately 20 percent of the ration card and baladi bread subsidies.

B. POLICY RECOMMENDATIONS

3.8. **It is recommended that the GOE gradually replaces its existing safety net with a cash-based program targeted at the poor through means-testing.** Such a move would provide two advantages. First, means-testing could potentially reduce the share of resources going to those who do not need the social safety net, allowing larger transfers to each beneficiary. Second, allowing all food prices to be determined by the market would reduce the scope for resources waste resulting from excessive consumption or diverting cheap food items for other uses such as feeding animals.

3.9. **The move to a cash-based targeted program would require several years to implement.** First, it takes several years to build on the existing social safety net by developing improved targeting mechanisms and substantially expanding the social assistance budget (see Chapter 2). Second, it will be politically difficult to phase out food subsidies, particularly that of baladi bread, given the fact that it is perceived as an "entitlement" not only by the poor but by the entire population, specifically in urban areas. Third, it is generally difficult to establish public support for cash transfers, and expansion of cash-transfer programs are advisable only once a good targeting mechanism is in place.

3.10. **In the interim, there are several options to improve the targeting of the existing food-subsidy system.** Solutions will not be simplistic: different steps are appropriate for different parts of the food-subsidy system and different commodities. This paper investigates the causes of the food-subsidy system's ineffectiveness and inefficiency in order to recommend policy changes. With regard to ***bread/flour subsidies***, it is recommended to:

- Use geographic targeting to increase the share of baladi bread and flour available in poorer parts of Egypt, and
- Maintain the supply of 10-piaster bread, while eliminating its subsidization.

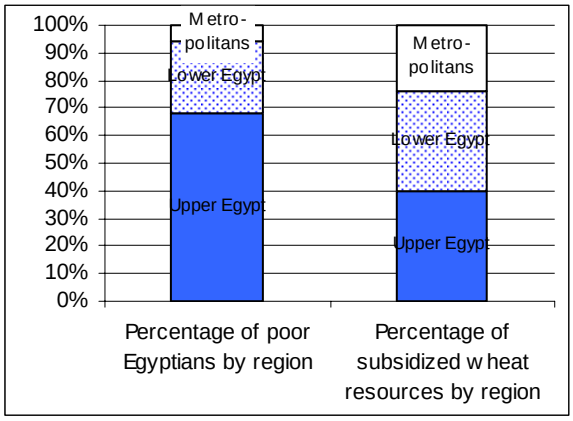
With regard to ***ration card products*** it is recommended to:

- Revise the eligibility criteria for high-subsidy ration cards so that they reach the poor,
- Actively enforce the eligibility criteria; and
- Reduce the transfers associated with the low-subsidy ration card.

Subsidies on bread/flour can be more effective in reaching the poor and use resources more efficiently if geographic targeting is used to focus distribution on locations with high concentrations of poor households.

3.11. **Upper Egypt – where a large share of the poor live – receives a disproportionately small share of subsidized bread and flour resources.** Meanwhile, the Metropolitan governorates, where relatively few poor Egyptians live, receive a disproportionately large share of subsidized wheat products (see Figure 3.5). In urban areas, subsidized wheat products are received by households principally in the form of bread sold by bakeries, while in rural areas, subsidized wheat products are more often received by households in the form of wheat flour to be used for bread baking at home. Because of this urban/rural distinction, it follows directly that a disproportionate share of subsidized bread is sold in urban areas. The important finding, shown in Figure 3.5 is different: this figure shows geographic allocation of resources for *both bread and flour* combined, and still finds that areas where the poor live receive a disproportionately small share of total subsidized wheat product resources.

Figure 3. 5: Geographic Distribution of the Poor and of Subsidized Bread and Flour Resources



Source: World Bank staff estimates, based on GOE data.

3.12. **Increasing the share of subsidized bread and flour resources going to poorer parts of Egypt would increase both the effectiveness of the subsidy (by reaching a greater proportion of the poor) and the efficiency of the subsidy (by reducing the share of resources being transferred to wealthier Egyptians).** This recommendation does not imply promoting consumption of baladi bread in rural areas or in Upper Egypt: the recommended policy could be implemented by increasing the subsidized wheat flour available in poor regions. Neither does this recommendation require closing bakeries in wealthier areas: the recommended policy only suggests *reducing* the quantity of subsidized flour distributed to bakeries in wealthier areas. (Indeed, it may be desirable to continue distributing the same quantity of flour to bakeries in wealthier areas but without the subsidy, i.e. at market prices.)

3.13. **In addition to improving the targeting of baladi bread and flour, the policies on other wheat products should be reconsidered as well.** As noted above, 10-piaster bread is primarily consumed by wealthier Egyptians. For this reason, elimination of this subsidy should be considered. It should be noted, however, that if the 10-piaster bread were withdrawn from the market, wealthier Egyptians might increase their consumption of the baladi bread. For this reason, it is recommended to maintain the supply of 10-piaster bread while eliminating the subsidy on it.

Ration-card subsidies can be improved by revising the eligibility criteria, actively enforcing compliance, and increasing the distinction between low- and high-subsidy ration cards.

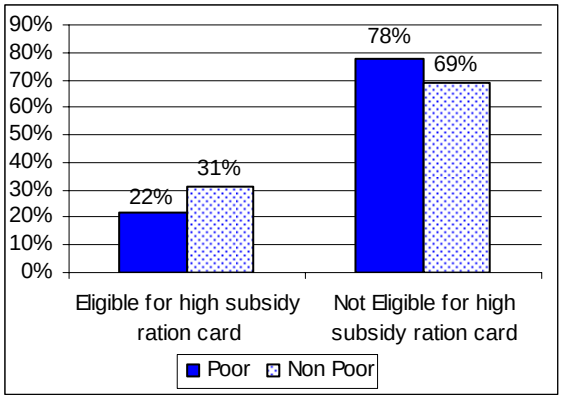
3.14. **Although ration-card subsidies are more poverty-targeted than subsidized wheat products, a significant proportion of the fourth (upper middle class) and even fifth (wealthiest) quintile have ration cards and purchase ration-card products.** Our analysis suggests two ways to improve targeting of ration cards: (i) revising the eligibility criteria to make the program more poverty-focused and (ii) actively enforcing eligibility criteria.

3.15. **The eligibility criteria for ration cards are not pro-poor.** All Egyptians born after 1989 are eligible for ration cards, providing they have not allowed their cards to lapse.[24] Because such a large portion of the population is eligible, it is useful to pay special attention on the

[24] A household which does not purchase the basic ration of sugar and oil risks having their ration card revoked.

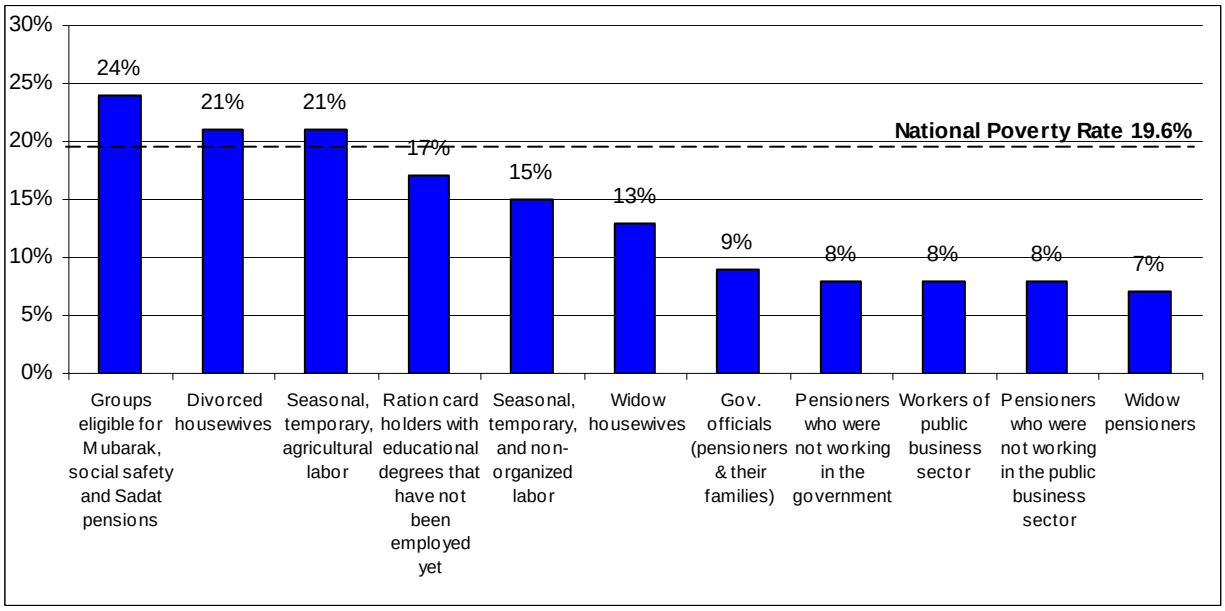
distinction between eligibility for a high-subsidy versus a low-subsidy ration card. A household is eligible for the high-subsidy ration card if it meets any of 18 criteria, including working in the GOE/public sector. Figure 3.6 shows that eligibility is regressive: poor Egyptians are less likely to be eligible for the high subsidy ration card than non-poor.

Figure 3. 6: Efficiency of the Current Eligibility Criteria in Relation to Poverty



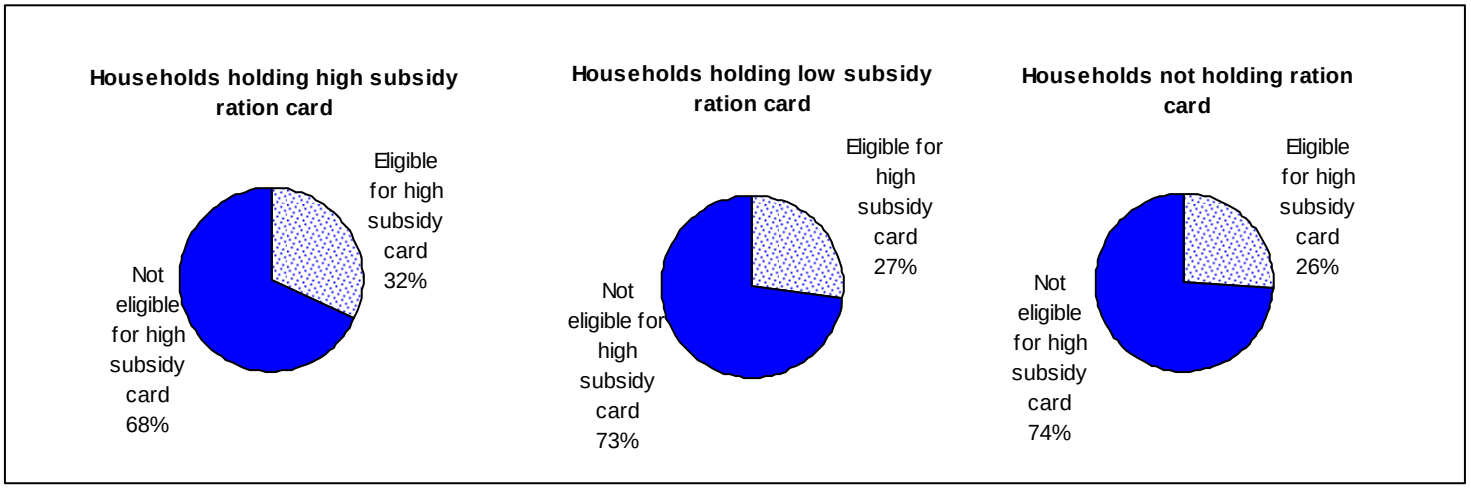
3.16. **Which of the criteria is the problem?** Among the various criteria by which a household can be eligible for high subsidy ration, the following provide pro-poor targeting: (i) eligibility for Mubarak, social safety and Sadat pensions; (ii) divorced housewives; (iii) seasonal and temporary agricultural laborers. All of the other criteria used are regressive in their targeting. The most regressive of the criteria are: pensioners (including former public and private sector employees and widow pensioners) and GOE/public sector employees. For example, poverty rates among workers in the GOE and public sector are about 8.5 percent compared to 19.6 percent in the general population (Figure 3.7). This finding suggests that eliminating these criteria could improve the targeting of ration cards. Additional criteria, such as illiteracy or residence in rural Upper Egypt, could also be added to the list in order to improve targeting. Indeed, the same criteria proposed for cash transfers – proxy-means testing and/or geographic targeting – could be applied to the ration-card program (see Chapter 2).

Figure 3. 7: Efficiency of Specific Eligibility Criteria
(Poverty rates among individuals who meet various eligibility criteria)



3.17. **The eligibility criteria are not well enforced, as shown by examinations of the extent to which holders of high-subsidy cards meet the existing eligibility criteria.** Indeed, as Figure 3.8 shows, there is very little relationship between eligibility and the type of card a household actually holds. More than two-thirds of those who hold full-subsidy cards do not meet the eligibility criteria. There is, therefore, considerable leakage to the non-eligible. It is also worth mentioning that a third of those eligible for the full subsidy hold no card at all. This finding suggests that active enforcement of the eligibility criteria – especially in combination with revised criteria – could improve the targeting of the ration-card system.

Figure 3. 8: Enforcement of Eligibility Criteria



3.18. **Currently, there is little difference in the transfer provided by the high- and low-subsidy cards.** The monthly transfer per person for holders of high-subsidy cards is only slightly higher than for holders of low-subsidy cards (LE 11.6 vs. LE 11.2, if households collect their full ration). Once targeting is improved and wealthier households are moved onto the low-subsidy ration cards, the transfers to those households can be reduced without hurting the poor and vulnerable. There are two ways to reduce the transfers made to low-subsidy ration card holders: (i) reducing the subsidy rates, or (ii) eliminating products from the ration. The first option may, for example, involve cutting the subsidy rates on sugar from 49 percent to 25 percent and on oil from 85 percent to 40 percent. The second option could initially involve eliminating the ration on the newly introduced products for low-subsidy ration card holders, while maintaining entitlement to these products for high-subsidy ration-card holders. The savings from reduced leakage could be used to increase transfers to the poor and vulnerable through the high-subsidy ration card or through some other mechanism.

3.19. **As previously discussed, in the medium term, the GOE may want to phase out the food subsidy entirely.** It is recommended that as the alternative cash-based transfer program comes online, the GOE begin to reduce the size of the ration program. Highest priority for elimination should be given to the newly introduced products, because the public may still view these subsidies as temporary and may not yet have developed a strong sense of entitlement. It is also important to consider the concrete recommendations that are likely to emerge from: (i) the "smart card" pilot in improving the targeting of ration card goods, and (ii) studies conducted at the IDSC for practical recommendations on improving the targeting of ration-card subsidies.

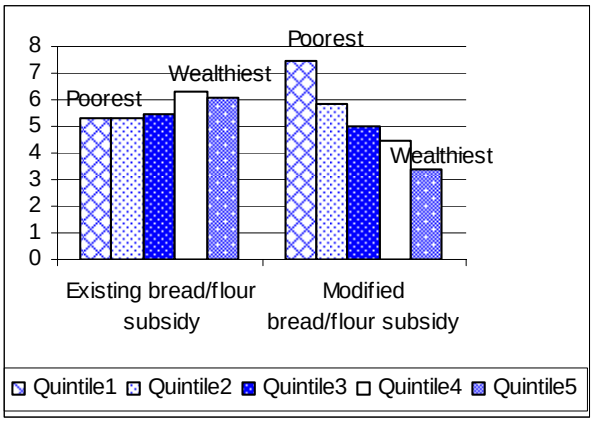
C. IMPACTS OF POLICY RECOMMENDATIONS

3.20. **This section covers the impact of implementing the recommendations identified in the previous section.** It is assumed that any resources saved by reducing transfers to wealthier households are used to increase transfers to poor and vulnerable households.

3.21. **The recommended geographic targeting of the baladi bread and flour subsidy (along with the elimination of the subsidy for 10-piaster bread shifts) the wheat product subsidies from being moderately regressive to being highly progressive.** The proposed reform includes (i)

focusing the distribution of wheat flour (going to bakeries and to households) on areas with high concentrations of poor households and (ii) removing the subsidy on 10-piaster bread (while continuing its distribution). The overall budget for this subsidy is expected to remain unchanged[25]. Figure 3.9 shows the impact, comparing the distribution of benefits under the existing bread/flour subsidy and the distribution of benefits under the modified bread/flour subsidy. As the figure shows, the proposed modification shifts the bread/flour subsidies from being moderately regressive to being highly progressive.

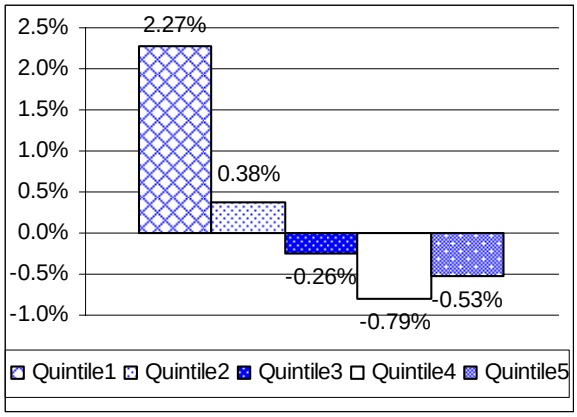
Figure 3. 9: Absolute Transfers Received in the Existing and Modified Bread/Flour Subsidy
(LE/person/month)



3.22. As with any targeting improvement that does not involve additional resources, the absolute value of transfers to the wealthiest is reduced. The proposed modification does *not*, however, require a significant reduction in the total consumption of the wealthiest. Indeed, as Figure 3.10 below shows, the proposed modification entails a reduction of only 0.5 percent in the consumption of the wealthiest, while providing an increase of 2.3 percent in the consumption of the poor. The proposed modification raises about 700,000 individuals out of poverty.

[25] After removing the subsidy on 10-piaster bread, the total quantity of absolute benefits received from baldadi bread/flour is reallocated to match the percentage of poor living in each region (according to Figure 3.5). This new total quantity of absolute benefit received from baladi bread/flour for each region is allocated among the five quintiles, with each quintile maintaining the same share of total absolute benefits.

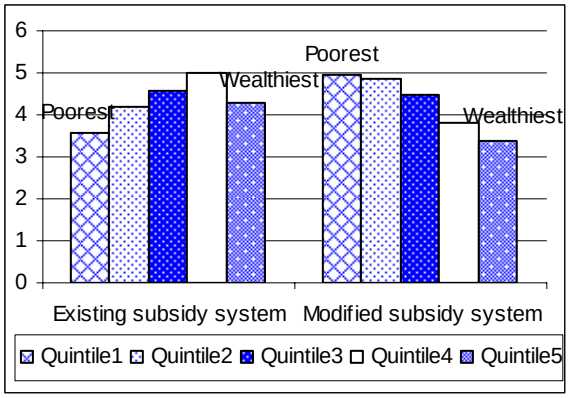
Figure 3. 10: Consumption Change Resulting from Modified Bread/Flour Subsidy
(Percentage change in total consumption by quintile)



3.23. **The proposed recommendations for the ration-card system would improve the targeting of the subsidies.** As discussed in paragraphs 3.12-3.16, potentially beneficial modifications include: (i) eliminating regressive criteria from the list for eligibility for the high subsidy ration card; (ii) actively enforcing eligibility criteria (including ensuring all those who are eligible receive a card), and (iii) reducing the transfer made to low-subsidy card holders (by reducing the subsidy they receive for sugar and oil and eliminating their eligibility for the newly introduced products)[26]. The total budget allocated to the ration card system remains unchanged. Figure 3.11 highlights the impact of reforming the ration-card subsidy. Compared to the existing system, the modified ration-card subsidy clearly performs better in targeting the poor and vulnerable. As with the modified bread subsidy, the modified ration-card subsidy allows a shift from a regressive system to a progressive system.

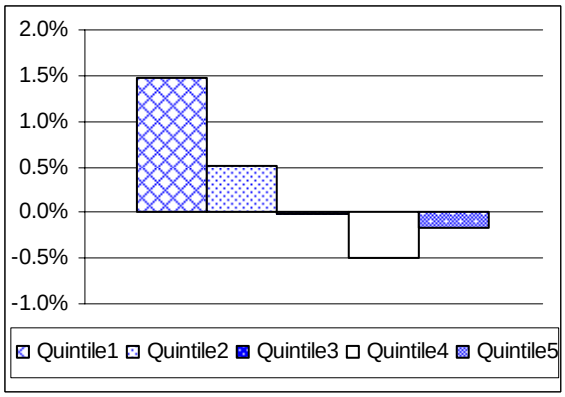
[26] This study recommends that eligibility criteria for high-subsidy cards be limited to those benefiting from the poverty-targeted programs of social security and social assistance pensions. All households are assigned high- and low-subsidy ration cards according to their eligibility (including giving cards to households that currently have no card). The maximum transfer a low-subsidy ration card holder could get if eligible only for sugar and cooking oil assuming the subsidy rates for each of these products were cut in half, is calculated. All low-subsidy ration card holders are assigned this maximum transfer (per person). The remaining absolute benefit is allocated among high-subsidy card holders (assuming all high-subsidy card holders receive the same amount).

Figure 3. 11: Absolute Transfers Received in the Existing and Modified Ration-Card Subsidy System (LE/person/month)



3.24. As with the modified bread subsidy, the proposed ration modification provides significant benefits to the poor, with only a minor reduction in the consumption of the wealthiest. The figure below shows that the proposed ration card modification entails a reduction of only 0.2 percent in the consumption of the wealthiest, while providing an increase of 1.5 percent in the consumption of the poor. And, as with the modified bread subsidy, the proposed ration modification raises about 700,000 individuals out of poverty.

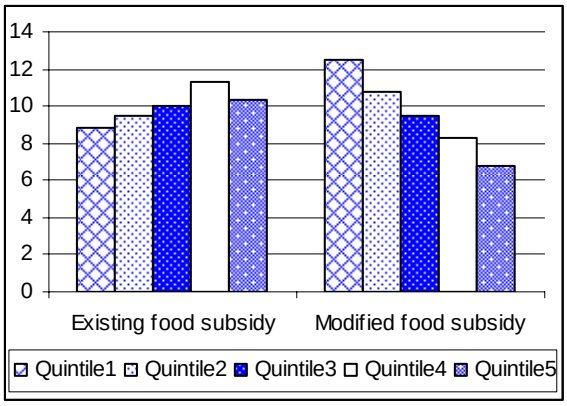
Figure 3. 12: Consumption Change Resulting from Modified Ration Subsidy
(Percentage change in total consumption by quintile)



3.25. **Implementing the proposed recommendations for wheat products and the ration-card system together would provide greater benefits than implementing either of the recommendations alone.** Figure 3.13 shows the combined impact of the proposed modifications. If both modifications are made, the poorest fifth of the population will receive an average benefit of 12.5 LE per person per month[27].

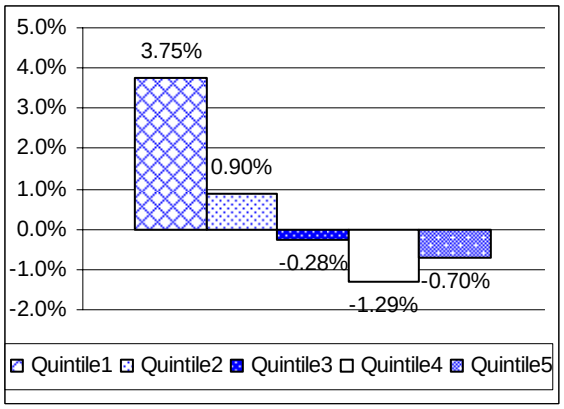
[27] The benefit of the combined modifications is the sum of the benefits from the modified bread subsidy alone and the modified ration-card system alone.

Figure 3. 13: Absolute Transfers Received
In the Existing and Modified Food-Subsidy Systems (Bread and ration card combined)
(LE/person/month)



3.26. The proposed modifications combined entail a reduction of 0.7 percent in the consumption of the wealthiest while providing an increase of 3.75 percent in the consumption of the poor (see Figure 3.14). Combining the proposed modified bread and ration card policies could raise more than one million Egyptians out of poverty.

Figure 3. 14: Consumption Change Resulting from Modified Food-Subsidy
And Ration-Card Systems Combined



3.27. **In conclusion, there is substantial scope for increasing the effectiveness and efficiency of food subsidies.** Much can be done to this end even in the short term by modifying the geographic allocation of subsidized bread/flour and by improving ration-card eligibility criteria and their enforcement. In the longer term, if the GOE develops a comprehensive targeted safety net, the food subsidies can be phased out entirely.

Box 3. 1: Summary of Subsidized Food Products

Subsidized bread and flour products are available to all Egyptians in unlimited quantities. However, these subsidies are, in practice, targeted in two ways. First, households choose whether or not to purchase subsidized bread based on its quality and price. Keeping the quality relatively low makes subsidized bread less attractive to wealthier households, thus self-targeting to the lower income groups. The second way in which subsidized bread is targeted is through the convenience or inconvenience households face in purchasing it. Subsidized bread is clearly more attractive to households that live close to a bakery and in an area in which the supply is plentiful. Thus, by controlling the availability of subsidized bread (via controlling the availability of the inputs and licensed bakeries) the GOE affects the geographic distribution of benefits.

Subsidized bread and flour products include:

- Baladi bread (also called five-piaster bread);
- 10-piaster bread (also called refined baladi bread);
- Fino bread (also called frangi bread);
- Flour.

In this chapter, only the baladi and 10-piaster bread are examined in detail because of lack of data on fino bread and flour. (Fino bread and flour are available in both subsidized and unsubsidized forms, which cannot be distinguished in the data). Baladi bread accounts for by far the largest consumption of bread in Egypt.

Rationed goods are available in limited quantities and only to households who hold ration cards. There are two types of ration cards: one providing a high subsidy rate and the other a low subsidy rate. Low-subsidy ration cards are theoretically available to all Egyptians, with the exception of anyone who has let their card lapse (by not using it for three consecutive months) and individuals born after 1989. High-subsidy ration cards are actively targeted: only households that meet one or more specified criteria are eligible. This criteria list includes, for example, GOE officials and divorced housewives.

Subsidized rationed products include:

- Sugar;
- Cooking oil;
- Rice;
- Pasta;
- Ghee/margarine;
- Beans/lentils;
- Tea.

The subsidy rates for high- and low-subsidy ration cards differ only for sugar and cooking oil.

Box 3. 2: History of Egyptian Food Subsidies

The food-subsidy system had its beginnings in the effort to cope with scarcity and inflation resulting from World War II. It was not initially designed as a safety net: it did not involve subsidies and was not targeted. The ration cards in particular were intended simply to ensure all Egyptians received a reasonable quantity of essential food items. However, the program has persisted since then, although with varying scope and size, and has become a strong symbol of the broader social contract between the Egyptian GOE and the population.

Since then, food subsidies have increasingly become a crucial element of Egypt's safety net, and an important means to ensure political stability in Egypt. Since the 1952 revolution, the GOE's stated goal has been to support an equitable distribution of food and income in Egypt (Ahmed *et al.*, 2001). This social commitment has further increased the fiscal burden, which reached high levels by 1977. After the GOE's repeated promises that subsidies on basic commodities would remain untouched, unexpected price increases sparked riots which ended only when the GOE annulled the subsidy cuts a few days later. Furthermore, in an attempt to emphasize the state role in promoting social equity, subsidies were increased in value and scope.

These riots have left a legacy of GOE caution regarding not only food-subsidy reform, but all economic reforms. Significant reform was not attempted again until the 1980s. Starting in 1981, the ration-card system was reformed in three ways: (i) the items covered by the ration card were reduced to oil and sugar; (ii) children born after 1989 were no longer eligible; and (iii) attempts were made to move less-poor households onto a new, lower-subsidy card.[28] Reform of subsidized bread began in 1984, when the price of baladi bread was raised from 1 piaster to 2 piasters, and then to 5 piasters in 1989. (In September 2003, the GOE introduced two types of higher-quality subsidized bread – 10-piaster bread and fino bread – at lower subsidy rates.) The reforms of the 1980s avoided sharp price increases that might be politically volatile. Rather, reform measures were undertaken gradually and quietly. This slow transformation of the subsidy system ensured a successful reduction in the fiscal burden of the subsidy bill, while avoiding political difficulties.

After the Egyptian pound was floated in January 2003, it depreciatied by more than 30 percent. Consequently, the prices of consumer goods, especially food, increased. This coincided with a drop in local wheat production, accompanied by an increase in international food prices and freight costs. Responding to public pressures, the GOE expanded food subsidies in April 2004 by raising the number of rationed products from two to seven, and introducing subsidized fino bread.

The Ministry of Supply and Internal Trade is responsible for administering and monitoring the food-subsidy system.

[28] The high-subsidy card is often referred to as a "green ration card," while the low-subsidy card is often referred to as a "red ration card," corresponding to their original colors. Both cards offer the same items, but at different prices (i.e., different subsidy rates).

CHAPTER 4: REFORMING THE ENERGY SUBSIDIES

The energy subsidies are substantial, with their economic cost reaching 8.1 percent of GDP in FY04, and an even higher amount in FY05. The high level of subsidies reflects domestic energy prices that are a small fraction of the international levels. Moreover, the energy subsidies distort economic decisions and benefit the rich more than the poor. Although the poor and vulnerable receive a disproportionately small share of the energy subsidies, removal of the energy subsidies would create hardships for these groups and would increase poverty, unless they are compensated through some kind of safety net program. It is recommended, therefore, that the phasing out of the energy subsidies be coordinated with the development of a comprehensive safety net system. Such a comprehensive safety net system was discussed in Chapter 2 of this report and is assumed to be financed through the resources currently being used for the energy (as well as food) subsidy programs. The simulations presented in this chapter show that it is possible to simultaneously reduce GOE spending on energy subsidies, economic distortions, and rates of poverty through the coordinated and phased package of policy reforms presented here and in Chapter 2 of this report.

A. Rationale for Reforming the Energy Subsidies

4.1. **There are three important rationales for reforming the energy-subsidy system: its cost is high, it has a distorting impact on economic decisions, and it benefits the rich much more than the poor**. First, the energy subsidies are costly to the budget, with their financial cost estimated at LE 21.7 billion (4.6 percent of GDP) in FY04, and is estimated to have increased in FY05. With more appropriate accounting of the opportunity cost of energy products, the economic cost of the subsidies would be much higher, estimated at LE 38.4 billion (8.1 percent of GDP) in FY04. Second, the economic impact of energy subsidies goes beyond the budget, as low energy prices distort economic decisions by encouraging excessive energy consumption, both now and in the future, as excessive investments are made in sectors that are intensive users of energy inputs. This creates pollution and harms the environment, and for any given production volume of petroleum, exports are reduced. When relative price distortions are large as is the case with energy subsidies, costs in the form of lower national welfare maybe substantial. Third, energy subsidies are regressive, benefiting the rich far more than the poor.

The energy subsidies are very costly to the budget. Reforming these subsidies will provide needed resources that can be used for expanding the cash-based social safety net, reducing the fiscal deficit, and contributing to growth-enhancing investment.

4.2. **Financial subsidies on energy products represent a heavy budgetary burden estimated at LE 21.7 billion in FY04, 4.6 percent of GDP, and 16.9 percent of total public spending**. The financial subsidies on energy products are calculated by the GOE as the losses of the Egyptian General Petroleum Company (EGPC) related to the quantity of Egyptian oil that is re-purchased from oil-extraction companies. The contract between the GOE and the companies gives the companies a share of the oil they extract. If the GOE wishes to consume part of the companies' share, EGPC re-purchases the oil from the company at a price close to the international market price. The size of the subsidy is calculated as the difference between the re-purchase price and the much lower price at which the GOE sells energy products to domestic consumers. The three products accounting for the largest subsidy in FY04 are: natural gas (LE 7.4 billion), diesel (LE 6.7 billion), and LPG (LE 4.2 billion). The GOE calculation does not include the subsidy on that part of domestic consumption that is related to the GOE's share of the output

of the oil-extraction companies, which accounts for approximately half the domestic consumption of diesel and natural gas and a third of domestic consumption of LPG (see Table 4.1).

Table 4. 1: Financial Subsidies of Energy Products in FY04
Direct Budgetary Cost

	Total Consumption	Of which, Quantity Re-Purchased from joint-venture Partner	Price Charged to Consumer	Price Paid to Partner	Financial Subsidy	Financial Subsidy/ GDP
Products	Thousands Ton	Thousands Ton	L.E / Ton	L.E / Ton	Million LE	(%)
L P G	3,076	2,027	200	1,858	4,183	0.9%
Gasoline 90	1,757	1,064	1,340	2,014	1,215	0.3%
Gasoline 80	758	245	1,238	2,037	315	0.1%
Kerosene	585	202	504	1,822	306	0.1%
Diesel (gas oil)	9,073	4,838	480	1,666	6,708	1.4%
Fuel Oil	5,751	1,982	199	879	1,502	0.3%
Natural Gas	22,864	11,340	214	837	7,487	1.6%
Total	44,810	21,698			21,716	4.6%

Source: World Bank staff calculation based on data from Ministry of Petroleum.

4.3. **The economic costs of energy subsidies are more appropriately measured by the opportunity cost (rather than the financial cost); if this measure were used, it would yield a much higher figure of LE 38.4 billion in FY04, about 8.1 percent of GDP**. In calculating the economic costs of resources used for energy-pricing policy, it is more appropriate to consider their opportunity cost, regardless of whether that part of domestic consumption is supplied from the GOE's or the joint-venture partners' share of the output. The economic subsidy for a given product is simply equal to the difference between its domestic price and its opportunity cost applied to the total domestic consumption of the energy products. The opportunity cost for oil products and LPG is the international price (given their export or import potential), while the opportunity cost of natural gas is its long-run marginal cost (due to its plentiful supply); see Box 4.1. Table 4.2 shows that the largest economic subsidies are absorbed by diesel, natural gas, LPG, and fuel oil. In FY04, about 37 percent of the economic subsidy on energy was absorbed by natural gas, 30 percent by diesel, 14 percent by LPG, and 10 percent by fuel oil.

Box 4. 1: Opportunity Cost of Natural Gas in Egypt

The opportunity cost of natural gas can be either its export/import parity price, its long-run marginal cost of production, or the cost of alternative fuels. The international price is the appropriate opportunity cost if proven gas reserves are limited; in that case, its appropriate opportunity cost is its export/import parity price, or it could be the alternative fuel price in the country at market rates. However, if the proven reserves are plentiful, the long-run marginal cost of producing the natural gas would be the more appropriate opportunity cost. In principle, this would also include the cost of transmission and distribution, as well as an accounting for the environmental impact. According to the Ministry of Petroleum, Egypt's proven reserves of natural gas are 68 trillion cubic feet (Tcf) and would last 80 years at current rates of production. In addition, the Ministry of Petroleum has stated that Egypt has an additional 120 Tcf of probable and likely gas reserves. This makes the supply of natural gas effectively unlimited. In this case, it is more appropriate to use the long-run marginal cost as the opportunity cost for natural gas. There is ongoing World Bank-GOE effort to identify the proper long-run marginal cost of natural gas, and this information is currently unavailable. In this report, it is simply assumed that the long-run marginal cost of natural gas is the cost of its re-purchase from

the joint-venture partner. The economic subsidy estimated according to this assumption (LE 14.2 billion in FY04) is likely to be an overestimate, given the purchase price from joint-venture partners is usually higher than the long-run marginal cost. On the other hand, if the international price was used as the opportunity cost, the economic subsidy of natural gas in FY04 would have been LE 22.4 billion.

Table 4. 2: Economics Subsidies to Energy Products in FY04 (at Opportunity Cost)

Products	Total Consumption	Price / Ton		Subsidies	Subsidy / GDP
		Domestic	Opportunity Cost		
	Thousands Ton	L.E / Ton	L.E / Ton	Million LE	(%)
L P G	3,076	200	1,964	5,427	1.1%
Gasoline 92	4	1,876	2,024	1	0.0%
Gasoline 90	1,757	1,340	2,012	1,180	0.2%
Gasoline 80	758	1,238	1,987	568	0.1%
Kerosene	585	504	1,758	734	0.2%
Diesel (gas oil)	9,073	480	1,780	11,789	2.4%
Fuel Oil	5,751	199	874	3,880	0.8%
Asphalt	942	273	907	597	0.1%
Natural Gas	22,864	214	837	14,234	3.0%
Total	44,810			38,410	8.1%

Source: Calculated from data obtained from Ministry of Petroleum

The opportunity cost is the international price (FOB Mediterranean) for all products, except for natural gas, where it is the long-run marginal cost. As information is not available on the long-run marginal cost, it is assumed to be the repurchase price form the joint-venture partner.

4.4. According to both t**he financial and economic definitions, the energy subsidies have increased drastically in recent years due to the growing gap between rapidly increasing international prices and very slowly increasing domestic prices; this has been exacerbated by the currency devaluation.** The estimated financial subsidy, as calculated by the GOE, is projected to increase further to LE 27 billion in FY05, a 25 percent increase from its value in FY04. If the opportunity cost of the full domestic consumption of subsidized energy products is used, the economic cost of these subsidies is projected to reach LE 47 billion, a 22 percent increase from FY04. Current levels of energy subsidies are substantially higher than in earlier years, largely because of a combination of increased international prices and, until recently, constant domestic prices. The recent devaluation of the currency has further contributed to the increase in the subsidies (see Box 4.2).

Box 4. 2: History of Egyptian Energy Price Subsidies

Domestic prices of all energy products have been controlled by the GOE for decades. In 1980s and early 1990s, the GOE raised energy prices significantly but gradually to reduce energy subsidies. There was no change in the nominal domestic price of any petroleum product between 1997 and 2004 (see Appendix Table D.2). While the price of LPG froze at its 1991 level (LE 2.5/12.5 kg cylinder), prices of gasoline were last adjusted in 1992 (LE 0.9/litre for octane 80 and LE 1.0/litre for octane 90), kerosene and diesel in 1993 (LE 0.4/litre for kerosene and ordinary diesel), and natural gas and fuel oil in 1997 (LE 0.141/cubic meter and LE 182/ton, respectively). These prices persisted until 2004, when

the GOE introduced two new types of gasoline with higher octane levels at higher prices, and increased the prices of diesel to LE 0.6/litre (up by 50 percent), fuel oil to LE 300/ton (up by 65 percent), and natural gas to LE 0.21/cubic meter (up by 49 percent). The exchange rate depreciated by 30 percent over 2003-2004, widening the gap between domestic and international prices. This gap has increased further due to the recent skyrocketing of international oil prices. The fact that domestic energy prices were frozen for a decade while their opportunity cost continued to increase has led to the current heavy subsidization challenge facing the GOE.

Keeping energy prices substantially below their opportunity cost creates the wrong incentives for resource allocation and leads to excessive energy consumption.

4.5. **Energy subsidies reduce the incentive for energy efficiency, leading to excessive energy consumption, which contributes to pollution and environmental degradation, and for any level of production, lower export revenues.** Prices in a market economy play a primary role in indicating relative scarcity and guiding optimal resource allocation. But when energy prices are fixed at low levels, firms and households make their choices on the basis of prices that give a false indication of resource abundance. As a result, firms and households consume excessive quantities of energy. In the absence of incentives to improve energy efficiency, firms tend to require very high levels of energy per unit of output.. Table 4.3 shows Egypt to be the greatest consumer of energy among the North African countries, with energy-use levels approaching those of China or the United States. Consequently, Egypt has one of the highest rates of carbon dioxide (CO_2) gas emissions among North African and many developed countries. Indeed, this is a standard argument for levying *taxes* on the polluting use of energy products, to reduce their harmful external effects. While current conditions do not allow for adding taxes on energy products, the high level of subsidization should certainly be reduced.

Table 4. 3: Energy Efficiency and Pollution for Selected Countries

Country	Energy use per unit output	CO_2 emission
Morocco	0.10	0.37
Tunisia	0.13	0.31
Brazil	0.15	0.25
France	0.17	0.24
Algeria	0.18	0.54
Egypt	*0.21*	*0.63*
China	0.24	0.58
United States	0.24	0.58
Jordan	0.27	0.81
Syria	0.32	1.00

Note: Energy use per PPP GDP (kg of oil equivalent per constant 2000 PPP $). CO_2 emissions (kg per 2000 PPP $ of GDP). Source: World Development Indicators, 2000.

4.6. **The subsidies distort investment decisions.** As firms make decisions based on the subsidized prices, they direct investment to sectors that heavily use the under-priced energy products. Most of the energy subsidies are captured by the industrial, transport, and electricity sectors, with households directly accounting for less than a fifth of energy consumption. Table 4.4 shows that households and commercial sectors combined accounted for 17 percent of total energy use in FY03, with the production sectors capturing most of the energy subsidies. The

specific sectors with a high energy cost relative to sectoral value-added include cotton ginning, coal refining products, non-metal industrial products, basic metal industries, and electricity. These are sectors that, in the absence of energy subsidies, would suffer sharp drop in profitability. Box 4.3 shows the impact of subsidized energy products on the electricity sector. It is likely that some existing industries maintain profitability only because of the energy subsidies.

Table 4. 4: Distribution of Energy Use in Egypt in FY03

Main Sector	Share (%)
Industry	30.0
Transport	41.9
Agriculture	0.3
Residential and Commercial	17.2
Electricity	7.4
Petroleum	3.3
Total	100.0

Source: Organization for Energy Planning, "Energy in Egypt 2002-2003", p.24

Box 4. 3: Fuel Subsidies in the Electricity Sector

The electricity sector appears to receive an insignificant financial subsidy (LE 842 million or 0.18 percent of GDP in FY04). However, this conclusion changes if one considers that the main inputs into electricity production – natural gas and diesel – are heavily subsidized.

- The electricity sector still purchases natural gas at 14.1 piasters/cubic meter and diesel at 40 piasters/liter, instead of the recently adjusted prices of 21 piasters/cubic meter and 60 piasters/liter. If the electricity sector were charged the higher prices faced by other sectors, the cost of producing electricity would increase by about 10.3 percent. If the subsidy on natural gas and diesel are included, the financial subsidy to electricity rises to 0.42 percent of GDP. (Note, however, that the total financial subsidy on oil and gas products plus that of electricity would not change. In order to avoid double-counting, the subsidy attributed to natural gas and diesel should be lowered when the subsidy attributed to electricity is increased.)
- The electricity subsidy using opportunity costs for inputs – estimated at LE 9.25 billion or 1.95 percent of GDP – would be even higher than the financial subsidy. This is calculated at the opportunity cost of the fuel inputs, which are international prices for oil products and the long-run marginal cost of natural gas assumed to be the repurchase price from the foreign joint venture partner.

Thus any reform in oil and gas products would have important implications for the cost structure and subsidy of electricity prices, and the need to reform them.

Electricity subsidies are not uniform across sectors: households are heavily subsidized, agriculture is marginally subsidized, and other production sectors are taxed. Though there is room for improving the targeting, the lifeline rates for household use of electricity are fairly well-targeted (see Table 4.5). This enables the poor, who use minimal services, to pay a lower price than wealthier households using higher levels of electricity.

Table 4. 5: Average Electricity Usage

Average Electricity Usage (Kwh/month), by Quintile

	Per capita Expenditure Quintile				
	Poorest 1	2	3	4	Richest 5
KWH/Month	195	210	215	230	324

Source: Household Income, Expenditure, and Consumption Survey

The energy subsidies that directly benefit households are generally regressive, disproportionately benefiting the rich, with the exception of the kerosene subsidy.

4.7. **Rich households benefit disproportionately more than poor households from the energy subsidies**. Figure 4.1 shows the direct benefits to households from four subsidized petroleum products: LPG, natural gas, kerosene, and gasoline. Individuals in the richest quintile receive more than two-and-a-half times the energy subsidy received by the poor. Table 4.6 shows that the regressive nature of the subsidy is not uniform across products. In particular, the regressivity (or disproportionate benefit to the rich) is greatest for gasoline, where 93 percent of its benefits go to the richest quintile. The subsidy of natural gas also disproportionately benefits the rich, given that the gas network is not available in rural areas, where a majority of the poor live, and the network is more likely to be available in rich than poor urban neighborhoods. The kerosene subsidy is an important exception to this pattern, as the poor benefit more from it than the rich. As people get richer, they switch from using kerosene to other fuel sources

Figure 4. 1: Distribution of Subsidies of Four Petroleum Products

(LPG, Gasoline, Kerosene, and Natural Gas)

(Percentage of Subsidy received by each quintile)

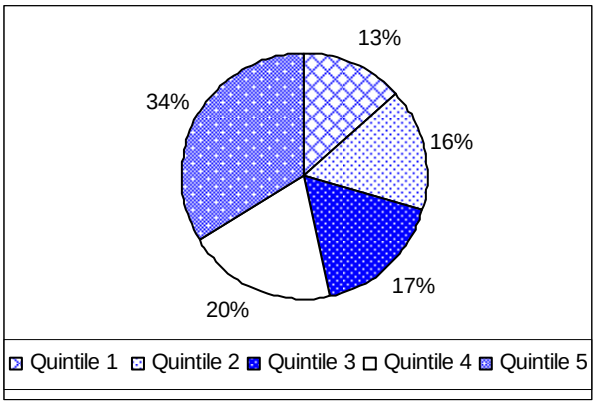


Table 4. 6: Absolute Transfers Received from Oil and Gas By Household Consumption Expenditure Quintile (Monthly LE per capita)

Product	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Overall
Kerosene	2.51	1.97	1.49	1.25	0.74	1.61
Natural gas	0.12	0.31	0.49	0.75	3.13	0.96
Gasoline	0.02	0.05	0.18	0.28	7.53	1.59
LPG	6.23	8.22	9.32	10.68	10.89	9.13
Above Four Products	8.88	10.55	11.48	12.96	22.29	13.29
Value of Four Subsidy as % of Consumption Value	7.66	6.51	5.66	4.93	4.07	5.15

Source: HIECS, July-September 2004.

B. Policy Recommendations:

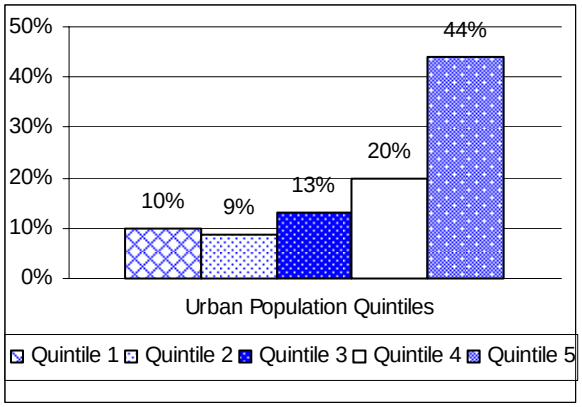
4.8. **It is recommended that the GOE develop a long-run strategy with the goal of liberalizing and regulating the energy market, rather than keeping prices fixed at highly distortionary levels, and assuming all related risks**. GOE reforms aimed at increased market-driven economic growth and a strong social safety net are inconsistent with the policy of fixed energy prices. The GOE reform of phasing out energy subsidies in the early 1990s was significant. Unfortunately, the reform agenda was put on hold for about a decade, leaving a much bigger challenge for the present GOE. Reforming energy prices would have been far easier if a sequence of small price adjustments for energy products had been continued. It is therefore important that the long-run reform strategy not only phase out current energy subsidies, but eliminate the possibility of similar dilemmas in the future by allowing a regulated market to set prices. Implementation of this strategy needs to (i) be linked to the development of an effective social safety net that protects the poor, and (ii) based on additional detailed analysis of the energy market, given that reform in one energy product will have implications for markets in others.

4.9. **Toward the long-term goal of market-driven energy prices, it is recommended that the GOE establish a mechanism for continuous and automatic price adjustments**. **The next section will examine the impact of cutting the energy subsidies across the board by 50 percent.** While this is not intended as a specific policy to be implemented, it illustrates the implications of reducing the energy subsidies to economic activities and households. Before this, the rest of the current section discusses specific recommendations regarding particular energy products.

4.10. **It is recommended to expand the natural-gas network in urban areas to include the urban poor, allowing reduced use of LPG in urban areas.** About 2 million urban residential and commercial customers are connected to the natural-gas network, and the GOE plans to connect an additional 6 million residential gas customers by 2020. The cost of building the network makes it reasonable to limit it to urban areas. But the gas network primarily benefits the rich. Figure 4.2 shows that 44 percent of the rich (top quintile) in urban areas have access to natural gas, while only a tenth of the urban poor and vulnerable (poorest two quintiles) are connected to the gas network. To expand access to the gas network for the urban poor, it is important not only to include their neighborhoods in the gas network expansion, but to develop financing mechanisms (possibly on concessionary terms) to help them benefit from this expansion. The connection fee, which covers the pipeline, meter installation, in-house piping, and conversion of appliances, is LE 3000 per household. The GOE pays half of this fee. However, the

poor are largely unable to finance the remaining half, which is roughly equal to two months' worth of expenditure for an average poor urban household. It is noted that the GOE subsidizes the connection fees equally for both poor and nonpoor households, and it is recommended that well-off households pay the full fees while the GOE can subsidize the poor and vulnerable households.

Figure 4. 2: Access of Households to the Gas Network in Urban Areas in Urban Areas in 2004, by quintile



4.11. There are two main benefits from this recommendation. First, given that the opportunity cost of natural gas is lower than that of LPG, encouraging a switch from LPG to natural gas would improve overall efficiency and reduce GOE subsidies. Second, as natural gas is metered, it is easier to target its subsidies to the poor through the tariff structure, which favors low-volume customers. [29]

4.12. **While the LPG subsidy should be phased out in the long run, it is important to carefully sequence this reform in order to provide alternative mitigation mechanisms for the poor**. There is no doubt that the LPG subsidy should eventually be eliminated, given its large price distortion and heavy budgetary burden. LPG is the most heavily subsidized energy product, with the GOE collecting LE 2.5 per cylinder (since 1991) although it has an economic cost of about LE 30. The economic cost of the LPG subsidy is very high – equal to 1.1 percent of GDP in FY04, and estimated to have reached 1.5 percent in FY05. The GOE also imports large volumes of LPG from abroad at international prices for supplying the domestic market at low prices. However, the LPG subsidy is important for the poor, providing an average per-capita monthly benefit equal to LE 7 for the urban poor and almost LE 6 for the rural poor (see Figure 4.3). These subsidies equal about 5 percent of the value of consumption expenditure of the poor, and are slightly greater than the value of the bread subsidies they receive. The poor in the urban areas would be protected from the phasing out of the LPG subsidy if they were provided access to the natural-gas network. But the rural poor would have no such alternative, as the cost of building the natural-gas network makes it economically unfeasible in sparsely populated rural areas and there is no obvious alternative to LPG. Any policy of differentiating LPG prices in urban and rural areas would be undermined by the opportunity it creates for some people to buy the cheap products in rural areas and re-sell it at a higher price in urban areas. Therefore, phasing out the LPG subsidy should only be done after an expanded social safety net has been put in place in rural areas.[30]

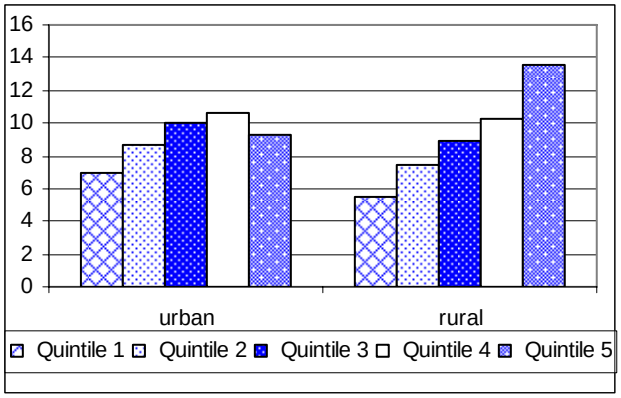
[29] The retail tariff schedule is: LE 0.1/cubic meter for the first 30 cubic meters, LE 0.2/cubic meter for the next 30 cubic meters, and LE 0.3/cubic meter for additional volumes.

[30] In addition to an expanded social safety net, it may be possible to partially shield rural households from the impact of increased LPG prices through programs that reduce the delivery cost of LPG cylinders. Depending on their location, households pay between LE 3 and LE 7 for each 12.5 kg cylinder, though

In the meantime, spending on LPG subsidies may decrease as increasing numbers of urban residents switch from LPG to natural gas.

Figure 4. 3: Value of LPG Subsidy, by Rural Urban Quintile

(LE/person/month)



4.13. **It is recommended to eliminate the regressive gasoline subsidy**. The gasoline subsidy is not very large in budgetary terms, accounting for 0.3 percent of GDP in FY04, and is estimated at 0.5 percent of GDP in FY05. Yet, the gasoline subsidy is highly regressive; the richest 20 percent of the population get 93 of the total gasoline subsidy, while the poorest 40 percent get less than 1 percent of the total gasoline subsidy. This reflects the high concentration of car ownership among the rich. Further, few poor households make even indirect use of gasoline, because fewer than 10 percent of poor households use buses, instead traveling on foot. When the polluting effect of gasoline consumption is also considered, there is little economic argument for maintaining the gasoline subsidy.

4.14. **The kerosene subsidy is progressive and relatively small in budgetary terms, and should not be eliminated for the time being.** The kerosene subsidy amounted to 0.2 percent of GDP in FY04, a relatively small share of the budget. It is also very well-targeted toward the poor, with the poorest quintile receiving 32 percent of the total kerosene subsidy, and the second poorest receiving an additional quarter of the total subsidy. In contrast, the richest quintile receives only 9 percent of the kerosene subsidy. This makes the kerosene subsidy better targeted than the cash assistance program or the baladi bread subsidy. While price distortion would be an issue, especially given substitution among energy products and as subsidies on other energy products are phased out, the progressive nature of this subsidy calls for waiting to reduce it until a much later stage in the reform of energy prices and subsidies. In the short run, it is recommended the kerosene subsidy be maintained.

4.15. **It is recommended to phase out diesel and fuel oil subsidies due to their heavy budgetary impact and distortionary impact on energy use**. The diesel and fuel oil subsidies are large, accounting for 2.4 and 0.8 percent respectively of GDP in FY04. Increases in the domestic prices of these products in FY05 still left them heavily subsidized, with the budgetary burden essentially unchanged as international prices increased as well. In the first half of FY05,

GOE outlets charge only LE 2.5 per cylinder, with the remainder going to private distributors. It is important to consider whether the distribution costs can be reduced (possibly through the Butagaz Company) in order to mitigate the impact of any future subsidy reductions.

the ratio of domestic to international prices was a quarter for diesel and less than a third for fuel oil. Diesel and fuel oil subsidies are used by production sectors, and not directly by households. It is therefore not possible to measure a direct poverty impact of phasing out their subsidies through the HIECS. But it is important to identify the likely poverty impact of phasing out these specific subsidies by analyzing the indirect impact of this reform on the prices of consumer goods, including transportation, which make heavy use of diesel and fuel oil in their production. Such a study should be done before reforming the diesel and fuel oil subsidies.

4.16. **It is recommended to phase out the electricity subsidies but to maintain the lifeline rate system**. As of October 2004, the Ministry of Electricity's started implementing a plan to raise electricity prices by 8 percent in 2004 and 5 percent annually thereafter for 5 years (irrespective of the level of inflation and other developments that influence economic prices). If the GOE wants to eliminate the economic subsidy in a reasonable time period, the rate of planned price increases would have to be accelerated. According to GOE estimates, the current plan eliminates the direct financial subsidy by the end of FY07. However, another two years of such price increases would be needed to compensate the sector if the fuel price discounts that it currently receives would be removed. Moreover, if the sector is to pay economic costs of fuel inputs, then electricity prices would have to increase by as much as 89 percent, requiring 13 years of annual price increases at a rate of 5 percent. An even longer timer period would be needed if inflation is positive. If the lifeline rate system is to be maintained, then price increases should be limited to subsidized production sectors and households that consume larger quantities. One possibility would be to more quickly reduce the subsidy for households consuming more than 230 kwh/month. Box 4.3 above shows that the average consumption of electricity is 195 kwh/month for the poor and 210 kwh/month for the vulnerable.

C. Implications of Policy Recommendations:

4.17. The implications of these recommendations are presented using two approaches. The first approach (in paragraphs 4.17 – 4.19) uses simulations based on the household survey. This approach addresses the proportion of subsidies that goes to households through their direct consumption of energy products such as LPG and gasoline. But this approach cannot capture the impact of energy reform on the production sectors, which in turn affects household income and consumption levels. Neither will it capture any reduction in household consumption of energy products if their price increases or likely changes in national welfare if the GOE changes subsidy and transfer policies. For these purposes, the second approach (in paragraphs 4.21 – 4.22) uses a general equilibrium model that includes the production sectors as well as direct consumption by households. The impacts of the policy simulation from the general equilibrium model are fed through the household survey to capture the poverty and distributional impacts. The CGE model used in this report has three energy sectors (petroleum and products, natural gas, and electricity), and models the responses of households and firms to price changes. The model simulates a 50 percent reduction in across-the-board energy subsidies to illustrate the impact of such a reform on welfare, the GOE budget, production sectors, poverty, and distribution. Household consumption is also responsive to price changes in the micro-simulation of the CGE results.

4.18. **Elimination of the gasoline and natural-gas subsidies will have a very small impact on the poor and vulnerable.** The combined effect of eliminating both subsidies will increase the incidence of poverty by 0.15 percent. If both natural-gas and gasoline subsidies are eliminated, the poor and vulnerable will suffer a monthly loss equal to LE 0.14 and 0.36 per capita,

respectively. These low figures reflect the limited access of the poor and vulnerable to the natural-gas network and their limited ownership of cars.[31]

4.19. **In contrast, eliminating the LPG subsidy will hurt the poor, raising the incidence of poverty by 4.4 percentage points** (see Table 4.7). The LPG subsidy constitutes 5.4 percent of the current consumption of the poor. Though the LPG subsidy is regressive (Figure 4.3 above), its relatively large impact on the poor implies that it should be phased out gradually, along with the adoption of complementary policies.

4.20. **A strengthened social safety net can help mitigate the negative impact of phasing out energy subsidies**. Table 4.7 shows the combined impact of eliminating the three energy subsidies (LPG, natural gas and gasoline) along with using half the saved subsidy in transfers that may be general to the whole population, or targeted either geographically or through a proxy-means-testing approach (with a 15 percent administrative cost) along lines proposed in Chapter 2. The table shows that without any corrective measures, the direct household impact of eliminating the subsidy of the three energy products would increase the number of the poor by almost 3 million people, raising the incidence of poverty by 4.53 percentage points. Most of the increase in poverty arises from the elimination of the LPG subsidy (4.4 percentage points). However, if half the savings from the subsidy elimination are used in a relatively well-targeted (proxy-means-tested) cash-transfer program, most of the negative impact on the poor can be mitigated. This is indicative of the inadequate targeting of the current subsidies, particularly those for LPG, gasoline, and natural gas, where the rich receive more of the benefits than the poor[32].

Table 4. 7: Poverty Impact of Eliminating Subsidies and Using Half the Savings for New Cash Transfer Programs (partial equilibrium impact)

Subsidy Removed	Poverty rate (%)	Savings (LE millions)	Transfers (LE millions)	New poverty rates*		
				Untargeted	Geographic	PMT
None	19.63	0	554			
Gasoline	19.66	1,341	1,224	19.15	19.2	18.79
Natural Gas	19.75	800	954	19.35	19.48	19.17
LPG	23.99	7,604	4,356	21.20	21.34	19.66
All Three	24.16	9,774	5,426	20.78	20.69	18.47

*: New Poverty Rates are calculated with subsidy elimination and 50 percent of savings added to transfers according to targeting. A 15 percent administrative cost is deducted from the transfer value for untargeted and geographic transfers; for PMT targeting, the deduction is raised to 23 percent Here we are assuming that the PMT program would cost an extra 8 percent compared to the other programs, in line with the figures in Chapter 2.

[31] The subsidy rates used in the incidence analysis are based on the H1-2005 GOE data. These rates are: 88 percent for LPG gas, 79.7 percent for natural gas, and 47.6 percent for gasoline (this rate corresponds to 90-octane gasoline).

[32] Notice in Table 4.6 that, contrary to what might be expected, geographic targeting performs worse than untargeted transfers in alleviating poverty. Because subsidy cuts hurt the rich more than the poor, while geographic targeting is clearly biased in favor of the poor, some rich and middle class people who fall into poverty are not assisted by appropriate transfers under geographic targeting. Note that PMT performs better because it targets the poor; yet at the same time a leakage rate of 30 percent (see Chapter 2) allows richer individuals who were hurt by the subsidy cut to benefit from sizeable transfers. This explains why the PMT scheme under the partial simulations in Table 4.6 performs better than the other two.

4.21. ***Though these simulations are informative, they are limited by two factors***. First, household behavior changes in response to higher energy prices are not taken into account. Second, they do not consider the fact that, indirectly, prices of all goods and services will change as energy production, consumption and trade change in response to higher energy prices. Both of these aspects are addressed in the CGE analysis presented in the next paragraphs.

4.22. **The CGE model shows that reducing the energy subsidies will improve national welfare significantly, and that there is a strong need for improved measures to protect the poor**. Details of the CGE model and the incorporation of household effects are described in Appendix A. Table 4.8 shows the impact of a 50 percent cut in energy subsidies (i.e., in the subsidies on electricity, petroleum and products, and natural gas) for two cases: when saved revenues are used to cut the budget deficit, and when saved revenues are used in a new, untargeted cash transfer program for the whole population in equal shares per capita. The total transfer value is net of additional administrative costs: for every LE in transfers, the GOE faces administrative costs of LE 0.15. The energy-subsidy cut raises energy prices, reduces GOE subsidy spending and overall consumption of energy products, makes more petroleum available for exports, reduces household consumption, and raises the incidence of poverty significantly. More specifically, for the first case where the gains from a 50 percent reduction in energy subsidies are used to cut the GOE deficit (i.e., the new cash transfer program is not introduced), then the impact is as follows:

- The budget deficit decreases by 3.8 percent of GDP, permitting an increase in private investment by 25 percent. (Total investment, public and private, increases by 12 percent, as a share of GDP from 17.5 to 20.7 percent).[33]
- Domestic prices of petroleum and natural gas rise by 67 and 162 percent, respectively with implications for other prices, particularly electricity, the producer price of which rises by 34 percent due to higher input costs. The price increases for electricity demanders also depend on changes in electricity subsidies and taxes. For households and agriculture, the average price increases are by 55-59 percent; for other sectors, which face an implicit electricity tax (negative subsidy) that also was cut, the average price increase is more moderate, around 18 percent.
- Domestic consumption of petroleum products declines by 5.7 percent, permitting petroleum exports to increase by 13 percent and leading to an appreciation of the real exchange rate by 1.8 percent, with a positive impact on domestic consumers of imported goods. Electricity and natural gas production, both of which are determined by domestic demand, decline by 3.4 and 10.3 percent, respectively, in the face of higher prices, leading to reduced utilization of sector capital stocks and saving non-renewable natural gas for future use. (Exports are not permitted to change – in FY 04, Egypt had no significant exports of electricity and natural gas.)
- Beyond the energy area, production sectors are affected differentially by this increase, with the largest production declines for sectors which face high energy costs relative to value-added, or which produce outputs that are highly tradable (exported or competing with imports), making them negatively affected by the real exchange rate appreciation. Sectors in these categories include cotton ginning, chemical industries, coal refining, and restaurants-hotels. Changes in domestic demand have a noticeable impact on production in some sectors, most importantly construction (which gains strongly from increased investment).
- For the most part, changes in sectoral incomes (paid to labor, capital and land factors) reflect changes in sectoral production. One exception is animal agriculture, where due to

[33] In Table 4.8, the reduction in the budget deficit is smaller than the reduction in spending in energy subsidies due to declines in revenue from taxes and GOE capital in the electricity and natural gas sectors (due to lower production and sales).

a fixed stock of animals, production changes very little but incomes decline due to a decline in household consumption, directly or indirectly the main demand source for the outputs of this sector. At the more aggregate level of model factors (labor, capital and land in agriculture; labor and capital outside agriculture), the income changes are more muted, reflecting the combined impact of gains and losses in several sectors. The largest loss is recorded for agricultural capital (primarily due to lower incomes to the animal stock).

- In the absence of compensatory measures, households suffer from the reduction in energy subsidies. Household welfare declines by 0.9 percent of GDP.[34] The rich suffer relatively more than the poor, given that energy subsidies favor the rich. These losses should be compared to the gains in the form of more investment and less environmental damage.
- The poverty impact of the reduction in energy subsidies is significant, with the incidence of poverty increasing by about 14 percentage points, from 20 to 34 percent of the whole population (i.e., out of a total population of close to 69 million, some 9.6 million fall into poverty).

These results point to the inherent trade-off between reducing the budget deficit and improving household welfare. Yet, reducing energy subsidies does create efficiency gains that can be used to finance better protection for households. This is shown in the second simulation where all the savings (net of administrative costs) are transferred to households in an untargeted transfer of an equal amount to every person, poor or non-poor (a value of 229 LE/person). This new transfer, which would be added to existing safety-net transfers, is very substantial.[35]

Table 4. 8: Impact of Reducing Energy Subsidies by Half With and Without an Untargeted Cash Transfer Program

Indicator	With 50 % Energy Subsidy Cut	Subsidy cut plus untargeted cash transfer
Total Energy Subsidy Cut (% of GDP)	4.5	4.5
Of which electricity (% of GDP)	0.08	0.07
petroleum (% of GDP)	2.78	2.80
natural gas (% of GDP)	1.68	1.67
New Transfer Program (% of GDP)	0.0	3.3
Increase in Petroleum exports (% of GDP)	0.5	0.5
Real Exchange Rate (% change)	-1.8	-2.3
Increase in GOE Savings (% of GDP)	3.8	0.0
Aggregate Household Welfare Gain (% of GDP)	-0.9	0.7
Incidence of Poverty (% of Population)	33.7	13.5

[34] Household welfare is measured by the "equivalent variation" (EV), which measures the income change at base prices that would generate the same welfare change as the one simulated. For a hypothetical illustration, consider the case of a decline in the price of a good consumed by households. The corresponding EV shows the income increase that would raise household welfare by the same amount in the absence of any price change.

[35] In Chapter 1 we noted that, other things being equal, for every poor person an average of LE 300 per year would be needed to raise his or her income to the poverty line. In this simulation, LE 229 is transferred to every person (poor or non-poor).

4.23. **Strengthening the social safety net is important to protect the poor and vulnerable from the reduction in energy subsidies. Indeed, if all the savings in energy subsidies are transferred to households in equal amounts, the aggregate household welfare will improve and poverty will decline significantly**. Compared to the preceding simulation (where GOE savings from a 50 percent energy subsidy reduction are used to cut the budget deficit), the major distinctive effects of a scenario with the same reduction in subsidies in combination with a new program where the GOE savings are transferred to households in equal amount per person (untargeted transfer) are as follows:

- Resources are available to finance a program of untargeted transfers equal to LE 15.8 billion, about 3.3 percent of GDP.
- The efficiency gains from the combined subsidy cut and transfer program are reflected in improved household welfare by 0.7 percent of GDP. In addition, this scenario provides the same benefits as the first simulation in the form of less environmental damage and larger natural gas reserves.
- The incidence of poverty decreases significantly, by about 6.2 percentage points, from 19.6 to 13.5 percent of the whole population (i.e., some 4.2 million would be raised above the poverty line).
- The fact that the cash transfers are untargeted means that the rich and poor receive the same amount. But given their higher consumption levels, the rich lose more from the subsidy cuts than the poor. The net result from a combined reform of subsidy cut plus a cash transfer favors the poor more than the rich, who are more able to withstand losses of subsidies in any case.
- The need to administer the new transfer program (reflected in a 15 percent mark-up on transfers) leads to a 4 percent increase in GOE consumption (with costs equal to 0.4 percent of GDP). Sensitivity analysis shows that it is of critical importance to keep administrative costs in check: 77 percent of the welfare gains vanish if the administrative cost mark-up is increased from 15 to 40 percent and, when the mark-up reaches slightly above 50 percent, the welfare change turns negative.
- Compared to the first simulation, the major changes in production levels reflect demand-side effects: higher GOE and household consumption require more non-tradable services (GOE services, housing and facilities, and personal services) while, in the absence of major increase in investment, construction does not grow. Compared to the base situation, the list of major losers outside the energy area remains the same as for the first simulation. In terms of factor incomes, the main differences is that outside agriculture, labor gains relative to capital due to the shift in demand from investment to household and GOE consumption.

4.24. ***All in all, cutting energy subsidies liberates a substantial amount of resources which can be used to finance well-designed cash transfer programs.*** CGE simulations conducted for the sake of this study, and which involve various hypothetical subsidy reform scenarios under different cash transfer targeting mechanisms, reveal the following key insights:

- A compensatory mechanism for poor households in the form of cash transfers is needed to avoid consumption decline in the face of subsidy cuts.
- Universal transfer schemes seem to perform better than targeted programs when the subsidy cuts (and the generated cash transfer level) are relatively sizeable. The loss in purchasing power for non-eligible households leads to an increase in poverty for this group when subsidy cuts are large.

- The simulated marginal welfare returns from subsidy cuts are declining, a reflection of bottlenecks in the economy as technologies, production, demand, and trade adjust to new incentives.
- In order to generate substantial gains, it is of critical importance to keep administrative costs in check.

4.25. ***The CGE simulations indicate that welfare may be improved considerably when subsidy reductions are introduced in conjunction with cash transfers.*** In the assessment of concrete reform programs, the CGE analysis needs to be complemented by a detailed micro-level examination of alternative transfer schemes, including targeting mechanisms and institutional arrangements, building on the analysis in Chapter 2.

4.26. ***In conclusion, there is substantial scope for welfare gains from phasing out energy subsidies, reducing distortions, and providing the poor with a more effective and efficient comprehensive safety net.*** The implementation of these policy recommendations requires the articulation of an energy-reform strategy with clear goals and concrete actions to achieve them. In particular, the timing and sequencing of reduced energy subsidies need to be further addressed. Because the budget of the comprehensive safety net system (discussed in Chapter 2) is assumed to rely on funds currently used for energy subsidies, future poverty reduction efforts will depend in large part on the implementation of energy subsidy reforms.

APPENDIX A: STRUCTURE OF THE COMPUTABLE GENERAL EQUILIBRIUM AND MICRO-SIMULATION MODEL

This Appendix presents the details of the Computable General Equilibrium (CGE) – Micro-Simulation (MS) Model. The CGE component of the model is disaggregated into 37 sectors and seven primary production factors. It is a real open-economy, single-period CGE model in the World Bank tradition. The CGE model is linked to the MS component through a vector of commodity prices as well as factor and transfer incomes. The MS model is based on the Household Income, Expenditure, and Consumption Survey (HIECS). To the best of our knowledge, this is the first application of this approach to Egypt.[36]

A.1. THE CGE COMPONENT

CGE analyses of the Egyptian economy have a relatively long history, with the first model dating back to 1976.[37] The current model has two, more immediate, starting points: (1) its general structure draws heavily on the standard model presented in Lofgren *et al.* (2002); and (2) its treatment of subsidies incorporates features from earlier models of Egypt, especially from the model underlying the analysis in Lofgren and El-Said (2001). It is built around a new Egypt Social Accounting Matrix (SAM) for FY04, assembled and estimated for this study.

Among the distinguishing features of the current model are a treatment of subsidies that reflects the workings of the Egyptian system, the incorporation of a social-transfer program with administrative costs, a representation of the energy sector that is sensitive to Egypt's conditions, and the design of factor and macro closure rules that are appropriate given the focus of this study.

A.1.1 Disaggregation

Table A.1 shows the disaggregation of activities, factors, institutions, and GOE taxes and subsidies in the CGE model and the SAM. There is a one-to-one mapping between activities (the producing sectors) and commodities (the outputs produced): each activity is the sole producer of a single commodity. To facilitate future model and database development, the disaggregation largely follows the one that underlies recent official Egyptian IO tables and SAMs.[38] The only major exception is a finer disaggregation of food production (with separate sectors for subsidized bread, non-subsidized bread, subsidized flour, non-subsidized flour, and other processed food).

A.1.2 Factors and Production

With the exception of energy activities (discussed below), each activity (representing a producer) is assumed to maximize profits, defined as the difference between revenue earned and the cost of factors and intermediate inputs. Profits are maximized subject to technology, prices (of outputs and intermediate inputs), and rental rates or wages (of factors). The model uses standard assumptions

[36] For discussions of poverty analysis in the context of CGE models, see for example Essama-Nssah (2005), Hertel and Reimer (2004), Agénor *et al.* (2004), and Lofgren *et al.* (2003).

[37] For surveys of CGE models of Egypt, see Lofgren (1994) and Thissen (1998).

[38] Professor Aboul-Einein of the Institute of National Planning made available the electronic files for the 1998/99 and 2002/03 Input-Output Tables and the 1998/99 SAM. See Ministry of Planning (2000) and the Institute of National Planning (2003).

about the production technology and the way intermediate inputs are incorporated.[39] As in most equilibrium models, it is assumed that *ex-ante* expected prices coincide with *ex-post* prices actually received.

Table A 1: Disaggregation of CGE model and SAM

Sets	Elements
Production activities (37)	Agriculture (2): crop agriculture; animal agriculture; Mining (3): petroleum and products; natural gas; mining and quarries; Other industry (26) subsidized bread; non-subsidized bread; subsidized flour; non-subsidized flour; other processed food; beverages; cigarettes and cigars; cotton ginning; spinning and weaving; ready-made clothing and leather shoes; wood and wooden furniture; paper, cardboard and related products; printing and publishing; leathers and leather industries; rubbzer and related products; chemical industries; coal refining products; non-metal industrial products; basic metal industries; metal products; non-electric machines; electric machines; transportation industry; miscellaneous industries; electricity; construction and maintenance; Services (6): transportation and communications; trade, finance and insurance; restaurants and hotels; housing and facilities; other personal services; government labor services
Factors (7)	Land; Labor – agriculture and non-agriculture; Capital – agriculture, petroleum, electricity, and other;
Institutions (3)	Household; Government; Rest of World
Other institutional accounts (6)	Taxes and subsidies (4): Direct taxes; Tariffs; Other indirect taxes; Subsidies; Aggregate institutional accounts (2): Savings-investment; Stock changes

The "closure rules" for the factor markets (i.e., the rules for bringing about equality between quantities supplied and demanded) are selected given the "short-run equilibrium" focus of this analysis.[40] In general, capital stocks are activity-specific and, for each activity, the quantity employed is fixed at the 2004 level; flexible rents record the scarcity value of each stock. For each non-capital factor, the total quantity employed across all activities is fixed at the 2004 level. The factors are mobile across the activities that use them and are allocated so as to equalize the marginal returns to each factor in all relevant activities. Each factor market is cleared by a flexible wage.[41] It is also possible to explore long-run resource pulls in response to reduced energy subsidies, by deviating from this set of assumptions and permitting non-agriculture capital (outside the energy sectors and mining/quarrying) to be fully mobile across sectors.

[39] At the top level, the technology is specified by a Leontief function of the quantities of value added and aggregate intermediate input. At the bottom, aggregated value added is a Constant Elasticity of Substitution (CES) function of primary factors (land and different types of labor and capital), whereas the aggregate intermediate input is written as a Leontief function of disaggregated intermediate inputs. Given that the relative changes in intermediate input prices are very large, each Leontief coefficient is endogenized, using a CES formulation, and responds to changes in relative intermediate input prices.

[40] The analysis refers to the short run, since capital stocks are fixed by sector: the time span is too short for current investment to lead to changes in installed capital or for capital to move between sectors (cf. Hazell and Norton 1986, p. 300).

[41] The assumption that total employment is fixed for each labor type (agricultural and non-agricultural) is appropriate given the nature of this analysis: we are not aware of any evidence suggesting that changes in food and energy subsidies would have any significant impact on the equilibrium aggregate level of (un)employment in Egypt.

In the model, the energy sector is given special treatment. For the petroleum activity, the quantities of factor use are fixed at the 2004 level. As a result, the production volume is also fixed. This reflects the fact that the level of petroleum production is determined by natural-resource constraints and long-run policies: The production volume of the petroleum sector, unlike most other sectors, does not respond endogenously to changes in input and output prices. For electricity, a flexible capital stock is available for use at a fixed unit rental price. Output is demand-driven and the market price is the sum of the unit costs of labor, capital, and intermediate inputs, adjusted for government demand-side subsidies.[42] It should also be noted that the output of the activity for government labor services is entirely determined by policy, as the government is the sole demander.

A.1.3 Domestic Institutions: Households and Government

The model captures the circular flow of incomes in the economy. The income of each factor, generated by production activities or transferred from the rest of the world (fixed in foreign currency), is split among domestic institutions and the rest of the world in fixed factor-specific shares.

In addition to factor incomes, *households* (here an aggregate institution representing households, enterprises and other non-government domestic institutions) receive transfers from the Government (CPI-indexed) and the rest of the world (fixed in foreign currency). Household income is allocated to transfers to the Government, direct taxes, savings and consumption. Direct taxes and savings are fixed and flexible shares of household income, respectively. (The reason for the flexible savings share is discussed below.) Disaggregated consumption is determined by Linear Expenditures System (LES) demand functions.

Besides factor incomes, *government* revenue consists of transfers from the rest of the world (fixed in foreign currency) and taxes – direct taxes from households, indirect taxes from domestic activities, sales tax revenues, and import tariffs. All taxes are *ad valorem*. The Government spends its revenue on consumption (fixed quantities, including government labor, except for changes related to the administrative costs of transfers and food subsidies), transfers to the household (as noted, CPI-indexed) and the rest of the world (fixed in foreign currency), and subsidies on domestic demand for food and energy. In addition, in most simulations government savings are allocated to a new transfer program. Administrative costs change when the new transfer program is introduced or when there are changes in food subsidies: for every LE in new transfers (in a setting with a fixed CPI), a fixed real quantity of government consumption is required (cf. discussion below of macro closures); equivalent savings in government consumption are introduced when food subsidies decline.

S*ubsidized food* items are disaggregated into subsidized bread, subsidized flour, and other (the ration-card items). Subsidized bread and flour are available to consumers at fixed prices in non-rationed quantities. Flexible subsidy rates assure that the consumer price remains unchanged even when market conditions change (i.e., these subsidies are not *ad valorem*). As a result of the subsidy, household consumption is distorted, exceeding the levels that would prevail under free market conditions. As opposed to bread and flour, ration-card subsidies (making limited quantities of various food items available at below market prices) have little direct impact on food consumption. This is because the quantities available fall short of what most households consume, forcing them to make supplementary market purchases. To capture this situation, the model treats these subsidies as a cash transfer from the Government to the household.

[42] For the current set of simulations, electricity production never increases to any significant extent. Thus, in effect, we only assume downward flexibility in electricity production.

As a result of leakages, a fixed share of the food subsidies does not reach poor households (i.e. not in the form of lower prices for selected food items). The leaked part of the subsidy benefit is allocated to non-agricultural capital incomes. This is compatible with the assumption that, at some point in the marketing channel, the subsidized items are sold at full market prices, generating profits for retailers and traders – in other words, owners of capital in the non-agricultural part of the economy (a relatively high-income part of the population).

As opposed to food subsidies, *energy subsidies* (on electricity and petroleum products) are not limited to households but reach all domestic demanders. Otherwise, they are treated in the same way as bread and flour subsidies: subsidized commodities are available in unlimited quantities at prices that are kept fixed via variations in subsidy rates. In simulations with energy subsidy cuts, we deviate from this by instead fixing subsidy rates and permitting prices to be flexible. In either case, the result is distortions in demand and trade for petroleum products and in demand and production for electricity.

A.1.4 The Rest of the World, Foreign Trade, and Commodity Markets

In addition to transfers to and from factors and domestic institutions, the rest of the world supplies imports and demands exports. Unless otherwise noted, we treat Egypt as a price-taker in international markets (Egypt is able to export or import any quantity it desires at international prices that are fixed in foreign currency). We assume imperfect substitutability in demand between imports and output sold domestically, and imperfect transformability on the supply side between exports and domestic sales. These assumptions grant the domestic price system a certain degree of independence from international prices and dampen export and import responses to changes in the producer environment.

These assumptions are not used for all sectors: For crop agriculture, we assume perfect substitutability between domestic output and imports. As a result, given non-zero imports, the domestic price is determined by the domestic-currency import price (transformed from the foreign currency price via the exchange rate and adjusted for import tariffs). This assumption was selected given that, in the different simulations, the major changes in demand for crop agriculture are due to declines in wheat demand (related to lower consumption of subsidized bread), a change that, given the lack of quality differences, should give rise to lower imports without any major change in the prices of domestic wheat or other domestic crops. For petroleum, we assume perfect transformability between domestic sales and exports. As a result, domestic market prices (not adjusted for subsidies) are determined by domestic-currency export prices, and simulated declines in domestic demand will give rise to increased exports without any losses.

With the above-mentioned exceptions – fixing selected prices explicitly in the context of domestic subsidies and implicitly due to foreign trade – all domestic prices of domestic outputs and composite commodities are flexible, performing the task of clearing relevant markets in a competitive setting where both suppliers and demanders are price-takers.

A.1.5 Macro System Constraints

The closure rules for the macro system constraints determine the manner in which the accounts for the Government, the rest of the world, and savings-investment are brought into balance. The rules have been selected in light of the purpose and context of our analysis: single-period analysis of the equilibrium welfare changes of subsidy reductions combined with increases in targeted transfers to households.

With respect to the *government* account, government savings (the current government surplus) is typically fixed.[43] Variations in a government budget item (targeted transfers to households coupled with an administrative component) assure that government savings are maintained at the predetermined level.

In the balance of *the rest of the world*, foreign savings (the current account deficit) is fixed while the exchange rate (the price of foreign exchange) is the equilibrating variable. We prefer to keep foreign savings fixed given that future welfare gains or losses from lower or higher foreign savings (increasing or decreasing Egypt's net foreign assets) are not captured in this single-period model.

On the spending side of *the savings-investment balance*, aggregate investment is fixed in real quantity terms. This is preferred, since welfare changes due to changes in real investment do not appear during the simulation period. On the savings side, uniform changes in the savings rates of each household category are used to generate a level of total savings needed to finance aggregate investment.[44]

The model is homogeneous of degree zero in prices – for example, a doubling of all prices and wages would double all nominal values but have no impact on any "real" phenomena (including household welfare and quantities of production, domestic demand, and trade). Fixing the aggregate consumer price index (CPI) provides a "no-inflation" benchmark against which all price changes are measured. This exclusive focus on relative prices is appropriate for counterfactual equilibrium analysis of issues related to resource allocation, taxes, subsidies, and incentives.[45]

A.1.6 Data and Sources

The bulk of the model data is based on a SAM (an 85x85 matrix) for FY04. This year was selected since it is the most recent one with relatively complete macro data. As a first step, we constructed a macro SAM using macro data (data for the national accounts, the GOE budget, and the balance of payments) available from GOE and World Bank sources. As a second step, we constructed an initial micro SAM for FY04, drawing on recent input-output tables (for 1998/99 and 2002/03) and SAMs (for 1996/97 and 1998/99) as well as scattered, disaggregated data for FY04 (including information on food and energy subsidies and value-added for aggregate sectors).[46] Inevitably, the initial micro SAM was out of balance. A SAM-Entropy program was used to estimate a balanced SAM that is fully consistent with the macro SAM and incorporates other pieces of information (exactly or with some error permitted). The program reflects the underlying philosophy behind SAM estimation, which is to create a consistent database that makes the best possible use of available data.[47] Table A.2 shows the structure of Egypt's economy in FY04, using data extracted from the micro SAM.

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[43] Government savings are invariably positive given that they refer to the difference between current revenues and current spending, excluding items on the government capital account.

[44] Savings from non-household sources – the Government and the rest of the world – are not free to equilibrate aggregate savings-investment. Given that real investment, (foreign currency) foreign savings, and government savings are all fixed, the changes in household savings rates are very small.

[45] On the other hand, it would not be appropriate if the analysis were to forecast short-run responses to stabilization policies, where interactions between the monetary and real spheres of the economy are important (although imperfectly understood, especially at a more disaggregated level). For a discussion of different treatment of the macro economy in CGE models, see Dervis *et al.* (1982, pp. 150-151), and Robinson and Lofgren (2005).

[46] The 1996/97 SAM underlies the CGE model used in Lofgren and El-Said (2001). The new 2004 SAM is available on request.

[47] The program was provided by Sherman Robinson and is available from him on request. For a presentation of the entropy approach to SAM estimation, see Robinson *et al.* (2001).

In addition to the SAM, the CGE model requires elasticities (production, foreign trade, and household consumption) and data on subsidy leakages. Elasticity values are shown in Table A.3. In the absence of any comprehensive set of econometric estimates, most of these were selected on the basis of cross-country literature, other model applications, and authors' assessments, considering among other things the relatively short time frame of the analysis. In the energy area, where the values matter the most, the elasticities were selected drawing on Abdel-Khalek (1988, p. 25), who, for petroleum products in the short run, estimates aggregate own-price and income elasticities of -0.15 and 0.25 respectively.

A.1.7 Mathematical Model Structure, Base Run, Validity, and Time Frame

CGE models are typically formulated and solved as systems of simultaneous equations exclusively made up of strict equalities. However, to permit potential regime shifts in foreign trade for commodities with perfect substitutability or transformability, we solved our model as a mixed-complementarity problem (MCP), consisting of a set of simultaneous equations that are a mix of strict equalities and inequalities. The GAMS modeling software is used both to generate the disaggregated SAM and to implement the model.

The model is calibrated to the micro SAM for FY04 – i.e., the parameters are defined so as to assure that the base solution exactly replicates the micro SAM for FY04. In the different simulations, the model is run in a comparative static mode. The results indicate the short-run equilibrium responses to changes in policies and exogenous shocks, comparing a new solution to the base solution. Each new solution represents a new equilibrium, since agents (producers and consumers) fully adjust themselves to new prices and incomes. In simulations where capital stocks are fixed by sector, we view the model as representing the short run: the time span is too short for current investment to lead to changes in installed capital or for capital to move between sectors (cf. Hazell and Norton 1986, p. 300).

We view the current model as valid for the purposes of this analysis. Simulation and informal validation were carried out in tandem while the model was fine-tuned in several areas on the basis of preliminary simulation results. However, there is no clear-cut validity test that can tell us how close the simulated model response is to the unobservable real-world response.[48]

[48] Simulation models (like CGE models, multi-market models, or agricultural-sector mathematical programming models) are appropriate in data-scarce settings where full econometric estimation and validation of a sufficiently detailed model is impossible. In response to the need for policy analysis, these models are pragmatically constructed in the spirit of making the best possible use of available information, including relevant aspects of economic theory.

Table A 2: Egypt Economic Structure in FY04

Sector	value-added	total exports	Share of exports in output	total imports	imports in demand	Ratio energy value-added
crop agriculture	13.2	0.7	1.2	15.4	23.9	0.7
animal agriculture	6.3	0.0	0.1	1.3	4.5	1.0
petroleum products	10.5	17.0	30.9			25.6
natural gas	3.7					0.1
mining & quarries	0.2	0.1	11.9	1.3	63.9	11.0
subsidized bread	0.2					30.0
non-subsidized bread	0.1					31.5
subsidized flour	0.0					6.8
non-subsidized flour	0.3			0.1	1.2	6.1
other processed food	1.6	1.1	4.1	13.6	35.4	22.7
beverages	0.6	0.0	1.2	0.0	9.1	0.4
cigarettes & cigars	2.0	0.0	0.1	0.0	3.6	0.1
cotton ginning	0.0	1.6	65.3	0.0	20.1	90.6
spinning & weaving	1.4	1.8	11.7	1.8	13.4	16.0
ready-made clothing & leather shoes	4.1	2.1	7.0	0.2	1.0	1.8
wood & wooden furniture	0.5	0.7	15.1	1.4	28.3	3.6
paper - cardboard & related products	0.3	0.8	40.7	1.9	65.3	2.1
printing & publishing	0.7	0.3	8.0	0.1	7.3	2.3
leathers & leather industries	0.2	0.5	38.5	0.0	19.4	0.5
rubber & related products	0.1	0.4	50.4	0.3	57.7	0.7
chemical industries	0.8	2.6	23.4	8.9	54.5	25.8
coal refining products	0.1	0.0	2.6	0.0	16.6	27.8
non-metal industrial products	1.2	0.8	7.3	2.3	20.5	20.7
basic metal industries	0.9	3.0	26.0	9.6	55.6	19.0
metal products	0.4	0.2	6.1	0.9	34.2	3.9
non-electric machines	0.1	0.2	16.6	4.3	87.9	3.4
electric machines	0.6	0.1	2.4	8.2	69.1	2.0
transportation industry	0.7	0.2	2.6	3.6	38.6	1.2
miscellaneous industries	0.4	0.5	14.9	4.8	64.1	2.3
electricity	1.9	0.1	0.6			
construction & maintenance	3.1					1.0
transportation & communications	7.3	12.9	35.1	1.3	5.4	8.7
trade & finance & insurance	15.0	43.7	64.9	5.7	20.3	1.6
restaurants & hotels	1.9	7.1	59.4			14.3
housing & facilities	5.6					0.5
other personal services	4.7	1.5	5.4	1.0	4.1	5.8
government labor	9.4					
petroleum imports				2.5	100.0	
tourism imports				9.5	100.0	
total	100.0	100.0	17.4	100.0	19.6	5.9
total agriculture	19.4	0.7	0.8	16.7	17.4	0.8
total non-agriculture	80.6	99.3	20.4	83.3	20.0	7.1

Source: Egypt SAM for FY04

Table A 3: Model Elasticities in Production, Trade and Household Demand

			Household demand*		
Sector (commodity or activity)	Value-added	CET	Armington	Income elasticity	Own-price elasticity
crop agriculture	0.6	1.6		0.61	-0.37
animal agriculture	0.6	1.6	3.0	0.82	-0.47
petroleum products	0.6			0.28	-0.15
mining and quarries	0.3	1.6	0.8		
subsidized bread	0.6			0.06	-0.03
non-subsidized bread	0.6			0.45	-0.23
subsidized flour	0.6			0.06	-0.03
non-subsidized flour	0.6		0.8	0.45	-0.23
other processed food	0.6	1.6	0.8	0.75	-0.43
beverages	0.6	1.6	0.8	0.99	-0.50
cigarettes and cigars	0.6	1.6	0.8	0.99	-0.52
Cotton ginning	0.6	1.6	0.8		
spinning and weaving	0.6	1.6	0.8	1.01	-0.51
ready-made clothing and leather shoes	0.6	1.6	0.8	1.01	-0.56
wood and wooden furniture	0.6	1.6	0.8	1.49	-0.75
paper - cardboard and related products	0.6	1.6	0.8		
printing and publishing	0.6	1.6	0.8	1.49	-0.75
leathers and leather industries	0.6	1.6	0.8		
rubber and related products	0.6	1.6	0.8		
chemical industries	0.6	1.6	0.8		
coal refining products	0.6	1.6	0.8		
non-metal industrial products	0.6	1.6	0.8		
basic metal industries	0.6	1.6	0.8		
metal products	0.6	1.6	0.8		
non-electric machines	0.6	1.6	0.8		
electric machines	0.6	1.6	0.8	1.49	-0.75
Transportation industry	0.6	1.6	0.8	1.49	-0.75
miscellaneous industries	0.6	1.6	0.8	1.49	-0.75
electricity	0.6	1.6		0.28	-0.14
construction and maintenance	0.6			1.49	-0.75
transportation and communications	0.6	1.6	0.8	1.34	-0.71
trade and finance and insurance	0.6	0.5	0.8		
restaurants and hotels	0.6	1.6		1.64	-0.83
housing and facilities	0.6			1.33	-0.70
other personal services	0.6	1.6	0.8	1.49	-0.78
government labor	0.6				
Petroleum imports				0.28	-0.14
Tourism imports				1.64	-0.83

Sources: Literature review and authors' assessments. For petroleum, the values chosen are informed by Abdel-Khalek (1988, p. 55). For household consumption, the values draw on Economics Web Institute (http://www.economicswebinstitute.org), which bases its information on the Economic Research Service (ERS) – U.S. Department of Agriculture (http://www.ers.usda.gov/data/InternationalFoodDemand/)

*For the LES demand system, the own-price elasticities are not independent -- they are function of the income elasticity, the Frisch parameter (set at -2), and base-year consumption values.

A.2. MICRO-SIMULATION COMPONENT

In order to assess the impact of alternative reform scenarios on poverty and income distribution, we complement the CGE analysis with a micro simulation (MS) analysis. The latter is based on a household model applied to the individual observations in the first quarter of the FY05 Household Income, Expenditure and Consumption Survey (HIECS). This section explains the methodology used for the MS analysis, outlining in the first subsection the links between the MS and CGE models and then presenting some data inconsistencies between the SAM and the household surveys. The next subsections explain the income calculations and the alternative transfer schemes, while the final subsection explains the various welfare results that can be calculated. The empirical results of this analysis are summarized in other parts of this report.

A.2.1 CGE-MS Methodology Links

The CGE model is linked to the MS component through a vector of commodity prices and factor and transfer incomes. Therefore, for the household welfare analysis, the MS model takes price and income changes and the new aggregate level of transfers from the CGE model as given and calculates the corresponding changes in poverty and income distribution. The welfare results vary according to the transfer program chosen, as explained below.

The MS methodology follows three main steps. First, for each simulation, a new price vector $\boldsymbol{p}$ is generated by the CGE model (via a mapping of commodities in the CGE model to the survey commodities). This vector is used to construct a price index for each household that reflects the commodities that the household consumes. The changes in prices (according to the results from the CGE model) that correspond to each of the household commodities will result in new levels of this price index for each household. Deflating the poverty line by the household's corresponding price index will result in a household-specific poverty line. We use the money-metric poverty line defined in Chapter 1, which includes the value needed to buy basic caloric intakes in addition to a necessary basket of other food and non-food commodities. Second, changes in factor incomes (labor, capital, and land) and changes in total government transfers from the CGE model are transformed into the corresponding income changes for each household in the survey. Both of these transformations are explained separately below. Lastly, the new total income for each household under each CGE simulation is compared to the new value of the household-specific poverty line to compute the relevant poverty and inequality measures.[49]

A.2.2 Inconsistencies Between Data Sources

The initial level of consumption spending Y is known for each survey observation. Thus, the issue is to generate a change in Y (ΔY) for each observation, translating aggregate information about changes in taxes, savings, and the different income flows into disaggregated changes, considering the base-level patterns of savings, tax payments, and income sources for each observation. This is not straightforward due to inconsistencies between survey data (which come from a self-weighted nationally representative sample) and SAM data (which underlie the CGE model). As shown in Table A.4, not surprisingly, the shares of taxes, savings, and, to a lesser extent, income flows are quite different. This is due to some combination of:

[49] The micro-simulation methodology follows Nicita and Olarreaga (2004) and Ravallion and Chen (2003).

a. Differences in time coverage, including seasonality in spending and incomes. The SAM is for the period July 2003-June 2004 (FY04), whereas the survey is nationally representative for the period July-September 2004.

b. Conceptual differences. In the SAM, the household component refers to an aggregate institution representing the entire non-government domestic economy (including enterprises and other non-government institutions) whereas, in the survey, "households" refers to families only. This affects income and spending items except for consumption. (By definition, only the households, narrowly defined, consume.)

c. Data errors. These are likely at both levels. Most obviously, the gap between total survey income and spending is too large to be attributed to savings. Moreover, macro data show that direct tax payments in the survey are seriously underestimated.[50]

Table A 4: Household Income and Spending Shares in Survey

SAM/CGE (%)

	SAM	Survey	Gap
Incomes			
Agricultural labor	2.0	2.5	-0.5
Non-agricultural labor	29.3	30.1	-0.8
Agricultural capital	8.6	9.6	-1.0
Agricultural land	9.7	2.0	7.7
Non-agricultural capital	40.2	33.7	6.5
Remittances from abroad	3.9	7.2	-3.3
Transfers from the government	6.1	12.0	-5.9
Cash benefits from ration card	0.3	1.2	-0.9
Targeted transfers from the government	0.0	0.0	0.0
In-kind transfers		1.7	-1.7
Total	100.0	100.0	0.0
Spending			
Consumption	73.8	64.4	9.4
Income tax	6.0	0.05	5.9
gov-transfers	2.0	0.03	1.9
oth transfers	0.0	1.6	-1.6
Savings	18.3	33.9	-15.6
Total	100.0	100.0	0.0

[50] Preferably, the SAM and the household survey data should have covered the same time period. If so, it would have been meaningful to re-estimate both jointly, generating a fully consistent dataset where the household survey data sum up to plausible national totals that appear in the SAM and where receipts and expenditures are equal both at the national level and for the individual survey observations (refer to Robilliard-Robinson). We do not know to what extent the results of this analysis would have been different if we had done all that. These observations raise issues related to the quality of and procedures for producing economic data in general and point to topics for future research.

A.2.3 Calculation of New Net Income

To resolve this discrepancy problem, we designed a procedure that is focused on household "net income" – that is, on income net of direct taxes, savings, and transfers to other institutions (referred to above as *Y*). This income equals the total consumption value. The procedure generates outcomes that match the aggregate net income changes of the CGE model while, at the same time, permitting the changes for each survey unit to depend on its specific income pattern.

The procedure is as follows:

1. Total new transfers from the CGE model are:
    a. scaled so that they represent the same share of total base *Y* in the survey as in the CGE model; and
    b. distributed across the households according to some schemes.
2. For each survey household, raw changes in other (factor and remittance) incomes, are
    a. computed by applying the relative income changes from the CGE model to the different income components of each survey household; and
    b. scaled so as to assure that, for the sum of all survey households, the total change in incomes relative to the base level coincides with that of the CGE model.
3. For each survey household and each simulation, a new net income value (*Y*) is computed as follows: $Y^{'} = Y^{0} + \Delta Y = Y^{0} + \left(\Delta Y^{oth} + Y^{ntr}\right)$
   where *Y'* = new income value; Y^{0} = base income; ΔY^{oth} = change in other incomes (factor incomes and remittances from abroad); and Y^{ntr} = new transfer income.

A.2.5 Welfare Results

Once one has calculated the new net income (which includes both the changes in factor incomes and transfers) and the new household-specific poverty lines (from changes in the prices of different commodities), then one can estimate various welfare results for each simulation. The MS methodology presents results for both poverty and income distribution. For the former, the headcount poverty rate, P0, is calculated under one (or more alternative) transfer schemes. For each CGE-MS simulation, the new net income for each household is compared to the new household-specific poverty line and a count is made of the number of households that fall below their corresponding poverty line. Changes in income distribution may be computed using the Gini coefficient or any other standard inequality measure

APPENDIX B: METHODOLOGY OF PROXY-MEANS TESTING AND TARGETING METHODS

This appendix describes the procedures and assumptions underlying the simulations presented in Chapter 2. The first section reviews the proxy-means test, and the second and third sections review the administrative costs associated with the targeting methods and new program types considered in the chapter.

B.1. PROXY-MEANS TEST

A very basic proxy-means test (PMT) was developed for Egypt for the purposes of simulation and comparison with the current targeting methods used with safety-net programs. It does a good job of identifying the poor and performs very well when compared to the current methods. An operational PMT would require more rigorous analysis and calibration, but the exercise here demonstrates the potential viability of such a system in Egypt.

The advantage of PMT is that it allows fairly good individual-level targeting of program benefits using a relatively small amount of information, without having to collect information on incomes or expenditures that may be unreliable. Development of a PMT requires nationally representative household data that has information on incomes, expenditures, and a variety of household and socioeconomic characteristics. The first-quarter FY05 Household Income, Expenditure and Consumption Survey (HIECS) provides sufficient information on Egyptian households on which to base a PMT.

The exercise involves two steps. First, a regression is estimated using the FY05 HIECS (Q1) data, which attempts to predict household consumption expenditures.[51] Per-capita expenditures are regressed on a large vector of explanatory variables, from demographic characteristics to geographic and residential features to income and employment aspects. The objective is to predict actual consumption using variables that can be easily collected from applicants and used to determine eligibility for the program.[52]

Table B.1 shows the final regression results with estimated coefficients. The R-squared coefficient, or fit of the regression, is high, indicating that nearly 60 percent of the variation in per-capita consumption observed in the sample is explained by the variables in the equation. The coefficients corresponding to the explanatory variables have the expected signs. For example, households with many children or adults tend to have lower per-capita consumption than others, as do those with an unemployed household head, as suggested by the negative coefficients. Conversely, households living in metropolitan areas or with a highly educated household head, or those that have many household amenities such as a private car or a washing machine, have higher per-capita consumption, other things being equal.

The second step is to use the predicted consumption levels from the regression to establish the eligibility for program benefits. A simple approach is to decide on a cutoff level of per-capita consumption; all households with predicted consumption below the cutoff would be eligible to receive benefits. All others would be excluded from participation in the safety-net program. Different cutoff levels can be selected depending on the available budget for the program (and the amount of benefits to be provided) and the proportion of the population that will be covered.

[51] This report uses data from the first quarter, corresponding to surveys conducted between July and September 2004.

[52] A more detailed discussion of PMT techniques can be found in Grosh and Baker (1995).

Because the predicted consumption levels do not perfectly correspond to actual consumption, there will inevitably be cases in which households or individuals are found not to be eligible, although they would be eligible if actual consumption were used instead. There will also be those found to be eligible that would not be eligible using actual consumption cutoff levels. These targeting errors are known as "errors of exclusion" (undercoverage) and "errors of inclusion" (leakage), respectively. All targeting methods have undercoverage and leakage to differing extents and no targeting method can be said to be perfect.

Figure B.1 shows the leakage and undercoverage rates for each cumulative share of the households that could be targeted using the estimated PMT. The households are ranked according to per capita consumption, so the horizontal axis reflects the cumulative distribution of consumption. The larger the share of the population that can be eligible, the smaller the leakage and undercoverage rates – if the program covered the entire population, leakage and undercoverage rates would be zero by definition. However, lowering leakage and undercoverage entails a tradeoff with higher budgets.

Figure B 1: Leakage and Undercoverage Rates Using the PMT

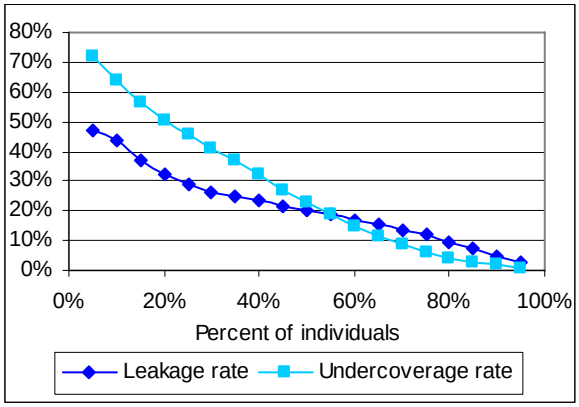


Table B. 1: Egypt Proxy Means Test Regression
Dependent variable: natural logarithm of per capita annual household consumption
Sample size = 11,745 households

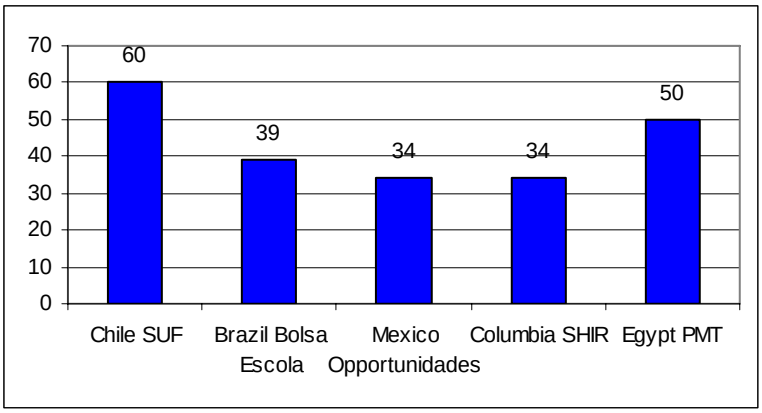
Variable	Parameter	Standard	Estimate	Error t Value Pr > |t|
Intercept	7.44493	0.04633	160.68	<.0001
Household head age	0.01380	0.00197	6.99	<.0001
HH age squared	0.00015318	0.00001991	-7.70	<.0001
Number of adults in household	-0.08859	0.00300	-29.51	<.0001
Number of children in household	-0.14466	0.00313	-46.16	<.0001
HH unmarried/single	0.16638	0.02034	8.18	<.0001
HH widowed	0.05338	0.01431	3.73	0.0002
Can read and write	0.07777	0.01164	6.68	<.0001
Below average degree	0.09924	0.01568	6.33	<.0001
Average degree	0.11209	0.01274	8.80	<.0001
Above average degree	0.16586	0.02233	7.43	<.0001
University degree	0.22011	0.01661	13.25	<.0001
Above university degree	0.46601	0.04621	10.08	<.0001
Unemployed	-0.22974	0.06820	-3.37	0.0008

Cooperative/NGO	-0.06541	0.02714	-2.41	0.0160
Private	0.13734	0.01373	10.00	<.0001
Public	0.04847	0.01825	2.66	0.0079
Salaries and wages	0.07886	0.01252	6.30	<.0001
Agricultural business	0.08677	0.01286	6.75	<.0001
Non-agricultural business	0.09882	0.01257	7.86	<.0001
Financial assets	0.22385	0.01925	11.63	<.0001
Non-financial assets	0.09023	0.01492	6.05	<.0001
Financial and in-kind transfers	0.03035	0.00915	3.32	0.0009
Metropolitan	0.23074	0.01211	19.05	<.0001
Upper Urban	0.14981	0.01291	11.61	<.0001
Upper Rural	0.13737	0.01046	13.13	<.0001
One separate room or more	-0.16974	0.02692	-6.30	<.0001
More than one apartment	0.09974	0.03076	3.24	0.0012
Villa	0.31996	0.07667	4.17	<.0001
Country house	-0.06686	0.01160	-5.77	<.0001
One room or more in bldg.	-0.17534	0.01710	-10.25	<.0001
Other	-0.05510	0.01620	-3.40	0.0007
Tap outside house	-0.18166	0.03886	-4.68	<.0001
Electric lighting	-3.41681	0.41665	-8.20	<.0001
No water tap	-0.09241	0.01386	-6.67	<.0001
Separate bathroom	0.11997	0.01030	11.65	<.0001
Private car	0.52469	0.01902	27.59	<.0001
Telephone	0.13772	0.00984	14.00	<.0001
Refrigerator	0.14303	0.01139	12.56	<.0001
Automatic washing machine	0.24940	0.01340	18.62	<.0001
Adj R-Squared	0.5907			

For the PMT targeting exercise, we have assumed that the goal of the program is to reach households and individuals that are below the poverty line. The solid vertical line in Figure B.1 corresponds to the share of households in poverty before the effect of transfers is considered (about 22 percent). Therefore, if a program targets the bottom 22 percent of the population considered to be poor, using the estimated PMT would result in an undercoverage rate of about 50 percent and a leakage rate of just over 30 percent. About half of those actually poor would not be eligible, and 30 percent of those who are not poor would be eligible for the program. About half of the truly poor would be included in the program.

Such targeting results compare quite favorably with other safety net programs that use PMT. Figure B.2 shows that among selected PMTs in use in Latin America, only the Chile eligibility test performs better in terms of coverage of the poor.

Figure B. 2: Coverage of the Poor Using PMT



1 Coverage defined as the percent of eligible poor households or the percent of those in the bottom consumption quintile who receive benefits.
Source: Castaneda and Lindert *et al.* 2005.

B.2. ADMINISTRATIVE COSTS FOR PMT AND GEOGRAPHIC TARGETING

To carry out the simulations and comparisons in Chapter 2, assumptions regarding the extent of administrative targeting costs were needed. However, costs vary tremendously depending on the type of program, the targeting method used, the availability of technology, local prices and other details. It is difficult to make assumptions that would be valid in any particular case. This section details the assumptions made for administrative costs with the PMT and geographic methods.[53]

[53] The administration of a cash-transfer program, including staffing and supplying offices and costs of delivering and monitoring cash disbursements, is separate from the costs of the targeting system such as PMT or geographic targeting. It is assumed that the administrative cost of a newly targeted cash-transfer program would be the same as the current social assistance programs run by MOISA. This is a very conservative assumption, and in practice it is likely that improvements in efficiency would be made along with new targeting methods.

B.2.1. PMT Costs

A very simple PMT based on a single household variable – electricity consumption – is examined in Chapter 2 before exploring a more refined approach. It is assumed that electricity consumption is accurately measured and that the information on billing is available electronically. Electronic storage makes retrieval of expenditure amounts quite straightforward for use in determining eligibility for cash transfers, requiring minimum involvement from potential beneficiaries. There is little internationally comparable information available on the costs of such a targeting mechanism, and it will be important to investigate institutions and mechanisms used in Egypt to determine the potential impacts of a PMT based on electricity consumption. For purposes of estimation, it is assumed that the annual administrative costs would be about 8 percent of the current budget allocated to beneficiaries (LE 44.3 million). This budget would cover the cost of processing electricity bills, determining eligibility and benefit levels, and distributing and monitoring benefits. Eligibility determination would not require a separate survey or a formal application procedure since all necessary information on electricity consumption is presumed to be available.

The cost of a more detailed PMT depends on how the system is set up in terms of information collection and verification, and local prices. Program intake and selection is done based on an application form using one of two data-collection methods: either an intensive survey or census in which interviewers visit all households, or applications taken on-demand at program administrative offices.

Using the census approach, interviews may cost anywhere from US $1.80 to more than $8 depending on the cost of interviewers, the distance between interviews and the density of the population to be interviewed. Table B.2 presents a range of interview costs for PMT systems in Latin America. Interviews in rural areas tend to be more expensive than those in urban areas because of distance and population density.

Table B. 2: Average Total and Annual PMT Costs in Latin America 2002

	Interview cost per household, urban-rural (US $)	Annual cost as share of targeted benefits (percent)
Columbia	$1.80 - $2.90	0.5%
Mexico	4.90 – 6.80	0.7
Costa Rica	4.20 - 7.00	0.9
Chile	8.40	1.3

Source: Castaneda and Lindert, *et al.* (2005)

Total costs using the on-demand application approach are likely to be less expensive than the census approach, since the number of interviews will be fewer; however, it is less clear how the methods compare if applicant opportunity cost is included. Cost in terms of travel and time would be much higher for applicants needing to register at administrative offices. And even with on-demand applications, home interviews are required for at least a subset of applicants to verify status and audit procedures.

For the calculations in the text, it is assumed that the cost of the PMT is about $5 per registered household, or LE 25. It is quite unlikely in practice that the PMT would be applied to every household in the country, since many well-off households would know they are unlikely to

qualify or because, for others, the time or social stigma associated with application would dissuade them. We assume that half of all households would apply and be subject to the PMT. All PMT systems require a recertification of households to determine continued eligibility for the program(s) and whether characteristics have changed. A recertification period of three years is assumed, although the period typically ranges between one and three years.

Combining assumptions, annual PMT costs for the simulations are assumed to be LE 64.2 million (7.7 million households interviewed multiplied by LE 25, divided by 3). This translates into 11.6 percent of current social-assistance benefits, unacceptably high by international standards. Table B.2 demonstrates that among Latin American countries using PMT, the targeting systems account for at most about 1.3 percent of benefits. To achieve this cost share, the level of benefits targeted using the PMT would need to increase to LE 4.9 billion, or nine times the current level. There are clearly economies of scale associated with the PMT.[54]

B.2.2. Geographic Targeting

Geographic targeting allocates resources based on the estimated share of the total number of poor or socially disadvantaged households or individuals living in each geographic area. Indicators depend on the type of program, and may include geographic poverty or rates of inequality, local educational or health status, or access to infrastructure. Geographic targeting is appropriate where poverty is, in fact, concentrated geographically and the targeting can effectively distinguish poor households.

In the case of Egypt, since the Upper Rural region has a high proportion of the country's poor, it is expected that geographic targeting would improve the distribution of benefits. The Upper Rural region would receive a proportionally higher share of program resources, and within the region benefits would then be distributed equally among all families in the region (whether poor or not), or targeted using another method such as proxy-means testing.

Geographic targeting assumes that an estimate of the number of poor by region is available, from either national household surveys or other sources. The cost of targeting is not that different from proxy-means testing, however, since households must still register, residence must be verified and the composition of the households must be determined. For example, in Nicaragua, the cost of using PMT was only 30 percent more than the cost of geographic targeting alone (Castaneda and Lindert *et al.* 2005). The simulations in Chapter 2 assume an annual cost for geographic targeting of LE 50 million.

B.3. PUBLIC WORKS AND CONDITIONAL CASH TRANSFERS

B.3.1. Public Works

The experience of the Social Fund for Development (SFD) with public works has been mixed. From 1992-2004, SFD and local financing resulted in LE 1.6 billion for infrastructure and public works, completing nearly 9,000 community projects and creating over 300,000 person-months of temporary employment. About 28 percent of the budget was spent on labor, requiring half of the labor to be hired in local communities. More than half of the expenditure has been directed to communities in Upper Egypt. However, projects were oriented much more to the creation of

[54] Many PMTs in Latin America are used to target benefits from multiple programs. For example, the PMT in Chile targets both safety net cash transfers and old age benefits, while in Columbia versions of the PMT are used by cash transfer programs, housing subsidies, and for certain health benefits.

infrastructure than employment. It has been estimated that the SFD's cost of creating a temporary job is between LE 5,000 and LE 6,000.

The Maharashtra Employment Guarantee scheme, regarded as one of the most successful large public works schemes from the 1980s, covered only 18 percent of households in the bottom income decile, and these only for a few days or weeks of work a year. But there are exceptions. The large public works programs quickly implemented in Indonesia, Thailand, and the Republic of Korea after the 1998 financial crisis created more than 225 million, 55 million and 25 million workdays respectively, and helped limit the negative impact of the crisis on the poor.

International evidence indicates that for public works program to be good investments, both the value of the infrastructure created and the pro-poor labor content must be carefully designed. The operation of the programs usually implies significant non-wage inputs which reduces the efficiency as a pure transfer to the poor unemployed. These inputs can amount to upwards of 40 to 60 percent of total costs. The Argentina Trabajar program had average labor costs of about 50 percent of total costs, while in Korea, labor costs reached nearly 70 percent of costs.

This and the forgone earnings of participants that may avoid other – but perhaps more volatile – private-sector opportunities result in a fairly low net transfer-to-total-cost ratio. Finally, administering public works programs often requires extensive local capacity and contracting arrangements.[55] The existing SFD project management infrastructure can be used in this regard.

We assume that the current safety-net transfer budget is converted to a public works program targeted to the Upper Rural region of Egypt. If 50 percent of the budget is devoted to labor, this permits LE 277 million for wages. Assuming further that a three-month job is provided to every participant at the rate of LE 350 per month, temporary jobs for more than 265,000 people would be created on an annual basis (nearly 20 million work days).[56]

B.3.2. Conditional Cash Transfers

Conditional cash-transfer programs provide cash to eligible families if certain behavioral conditions are met, typically including ensuring that all children attend school regularly and receive routine medical examinations and vaccinations. The objective is to alleviate poverty in the short term through cash assistance while helping children to maintain and develop human capital.

The exact conditionalities will differ from context to context depending on the social problems deemed to be most urgent. Behavioral requirements may include pre-natal medical care, education in early childhood development, school attendance by children of school age or regular medical care by mothers and children. Table B.3 illustrates the variation in the conditionality requirements and benefit levels for selected CCTs in Latin America.

The provision of cash serves two purposes. First, it helps reduce poverty in its own right as a transfer benefit. But perhaps even more important, it compensates the family for the opportunity cost of changing behavior – forgone earnings of children who would otherwise work, transportation and time-value costs associated with medical visits, etc. Programs such as

[55] Ravallion (1999) has noted that once estimated future gains to the poor from the assets created through the public works are taken into account, workfare schemes may be superior to alternative safety-net programs, particularly in middle-income countries.

[56] Wages are based on the public sector minimum wage. Rates could be significantly lower in practice, as the daily wages paid by the SFD in a governorate in the Upper Urban region were between LE 12 and LE 18 in 2003.

Mexico's have gone to great lengths to determine relevant opportunity costs for families in different circumstances and designed benefit payments accordingly.

Administration of CCTs requires extensive registration and verification. Often, the programs employ PMT or a combination of geographic and PMT targeting, which requires large survey efforts and database maintenance as described above. In addition, verifying that conditionalities are being met requires close collaboration with the Ministries of Health and Education, also entailing a management-information system that links these records with benefit payments. Then there is the usual cost associated with transferring and dispensing cash and the staffing of program offices. International evidence indicates that the administration of a cash-transfer program will cost between 5 and 10 percent of the total program budget. The annual operating costs of Mexico's *Oportunidades* are about 6 percent of total program costs, for example.

Current CCTs generally have budgets between 0.06 (Turkey) and about 0.10 percent (Columbia, Brazil) of GDP for small and medium-sized programs, and up to 0.3 percent of GDP for large programs such as *PROGRESA*.[57] The coverage can range from 1 to 5 percent of the population for typical programs. Well-run programs succeed in targeting up to 70 percent of benefits to the poorest two population quintiles.

Applying these averages to Egypt, we assume that administrative costs would be 10 percent of total program costs, and that 5 percent of the population is covered, with 70 percent of the benefits reaching the poorest two quintiles. This implies that there would be LE 554 million in benefits, with LE 388 million going to families in the bottom 40 percent of the expenditure distribution and another LE 166 million "leaking" to the remaining 60 percent of the population. Randomly choosing eligible households to ensure a total coverage of 5 percent and distributing benefits equally leads to a poverty rate of 19.3 percent.

[57] Ayala, (2003).

Table B. 3: Conditionality and Transfer Size of CCT Programs in Latin America and the Caribbean

Program	Conditionality		Transfer size	
	Education	Health and Nutrition	Education Local Currency	Health and Nutrition Local Currency
Bolsa Escola, Brazil	At least 85% school attendance in a three-month period		R$15 – R$45 (US$6-19) per family	
PETI, Brazil	At least 80% school attendance and participation in the after-school program *Jornada Ampliada*		Varies across states between $R25-39 (US$11-17) per child per month	
Familias en Acción, Colombia	At least 80% school attendance in a two-month cycle	Regular health-care visits for child's growth and development monitoring	Primary: Col$14,000 (US$6) per child per month Secondary: Col$28,000 (US$12) per child per month	Col$ 46500 (US$20) per family per month
PRAF II, Honduras	School enrollment and maximum seven days of school absence in a three-month period.	Compliance with the required frequency of health center visits	Educational voucher: L$ 828 (US$58) per child per year Average supply incentive: L$57,940 (US$4,000) /school/year	Health voucher: L$660 (US$46.3) per family per year Avg. supply incentive L$87,315 (US$6,020)/facility/year
PATH, Jamaica	Minimum school attendance of 85% (maximum nine days of school absence per term	Compliance with the required number of health visits per year, which varies by beneficiary age/status	J$500 (US$9)/child/mo	J$500 (US$9) per eligible household member per month
PROGRESA, Mexico	School enrollment and minimum attendance rate of 85%, both monthly and annually		Primary: varies by grade US$8-17/child/month + US$11/year/child for school materials Secondary: varies by grade and gender US$25-32/child/month + US$20/year/child for school materials	Mex$125 (US$13) per household per month (1999)
Red de Protección Social, Nicaragua	School enrollment; less than six days of unexcused school absence in a two-month period school; and school grade promotion		Grant: C$240 (US$17) every two months per family School material support: C$275 (US$20) per child per year Supply incentive: C$10 (US$0.7) per student every two months	Health voucher: L$660 (US$46.3) per family per year Avg. supply incentive

Source: Rawlings and Rubio (2004)

IV. Simulated Regional Poverty Rates Using Different Targeting and Program Approaches Budget = LE 554 million

	Pc	P0	PMT	GEO1	GEO+PMT	Public Works	CCT	PELEC
Metropolitan	6.22	5.99	6.22	6.22	5.92	6.22	5.88	6.07
Lower urban	10.94	10.60	10.67	10.62	10.59	10.94	10.46	10.59
Lower rural	13.65	13.06	12.94	13.16	12.77	13.65	12.85	12.64
Upper urban	20.75	20.37	20.29	20.68	20.29	20.75	20.23	20.40
Upper rural	41.89	40.94	39.90	40.63	40.21	38.59	40.26	40.78
Egypt	20.19	19.63	19.36	19.67	19.33	19.32	19.34	19.48

Pc: poverty rate excluding the safety net transfers
P0: poverty rate with current targeting
PMT: poverty rate with PMT applied
GEO1: poverty rate with geographic targeting, giving governorate average to all individuals
GEO+PMT: poverty rate when PMT used to allocate within each governorate.
PELEC: poverty rate with electricity based targeting

Budget= LE 1.1 billion

	Pc	P0	PMT	GEO1	GEO+PMT	PELEC
Metropolitan	6.22	5.78	6.10	6.09	5.92	5.95
Lower urban	10.94	10.27	10.67	10.49	9.70	10.35
Lower rural	13.65	12.24	12.30	12.86	12.17	11.90
Upper urban	20.75	19.97	19.76	20.50	19.65	20.00
Upper rural	41.89	39.36	37.95	38.89	38.87	39.49
Egypt	20.19	18.86	18.57	19.05	18.61	18.82

Budget= LE 3 billion

	Pc	P0	PMT	GEO1	GEO+PMT	PELEC
Metropolitan	6.22	5.66	5.92	5.83	5.60	5.27
Lower urban	10.94	10.14	9.70	9.76	8.83	9.37
Lower rural	13.65	12.13	10.41	11.45	10.06	9.49
Upper urban	20.75	19.48	15.99	18.96	14.93	18.31
Upper rural	41.89	37.80	27.43	33.06	31.25	34.63
Egypt	20.19	18.30	14.60	16.76	15.21	16.36

Budget= LE 10 billion

	Pc	P0	PMT	GEO1	GEO+PMT	PELEC
Metropolitan	6.22	5.66	5.60	4.85	5.60	4.36
Lower urban	10.94	10.14	8.83	7.15	8.83	8.32
Lower rural	13.65	12.13	9.42	7.86	9.42	8.14
Upper urban	20.75	19.48	11.74	14.27	11.74	15.49
Upper rural	41.89	37.79	13.84	14.07	14.34	26.77
Egypt	20.19	18.30	10.02	9.58	10.15	13.23

V. Cost of transferring 1 LE to the poor

Program	Current budget	1.1 billion	3 billion	10 billion
PMT	1.95	1.78	1.67	1.67
GEO	4.00	3.71	3.56	3.56
GEO+PMT	2.01	1.83	1.72	1.72
ELEC	3.14	3.01	2.94	2.91
CCT	2.11			
Public Works	2.01			
Current Safety Net	4.39	4.31	3.73	2.73

APPENDIX C: DETAILS OF FOOD-SUBSIDY CALCULATIONS

C.1. CALCULATION OF FOOD-SUBSIDY RATES

Throughout this chapter, subsidy rates are calculated according to financial cost to the Ministry of Supply and Internal Trade. Alternatively, subsidy rates could be calculated based on open-market prices for the closest substitutes. Table C.1 compares the rates using these two methods[58].

Table C. 1: The Difference Between the Two Ration Card Types

	Market Price	Rationed product price	Subsidy rates based on market price	Subsidy rates based on cost to MoS
	(LE/ration allocation)	(High Subsidy)	(High Subsidy)	(High Subsidy)
Sugar	2.3	0.6	73.90%	64.00%
Oil	2.5	0.5	80.00%	89.80%
Additional Oil	2.5	1.75	30.00%	64.20%
Tea	1	0.65	35.00%	-8.80%
Ghee	12	9	25.00%	18.00%
Beans	1.5	1	33.30%	36.00%
Lentils	2.375	1.5	36.80%	19.80%
Rice	2	1	50.00%	59.00%
Pasta	2.25	1.5	33.30%	36.30%

Subsidy rates based on cost to the Ministry of Supply and Internal Trade is considered more appropriate because rationed products tend to be of significantly lower quality than open-market products and are therefore not close substitutes. In any case, as Table C.1 shows, the two methods produce similar patterns of subsidy rates.

C.2. EFFECTIVENESS AND EFFICIENCY OF FOOD SUBSIDIES BY PRODUCT

Who benefits from bread subsidies?

Throughout Chapter 3, subsidized bread and flour products are addressed separately from all other subsidized foods. There are two related reasons for this distinction. First, all Egyptians are permitted to purchase subsidized bread and flour, while only those who hold ration cards can purchase the other subsidized food products. Second, households can buy any quantity of subsidized bread and flour, but can purchase only limited quantities of ration-card products.[59]

[58] The subsidy rate based on market price = (market price-rationed product prices)/market price.

[59] In fact, ration-card holders are required to purchase the basic quantities of cooking oil and sugar. If they do not purchase these products for three consecutive months, they risk having their ration card revoked. The extent to which this policy is enforced is not known.

Consumers have access to four different subsidized wheat products:

- Baladi bread;
- 10-piaster bread;
- Fino bread;
- Flour.

This report examines only the baladi and 10-piaster breads, because no data is available on the last two products. The omission of subsidized fino and flour is not a great problem, given that these account for a very small portion of consumption, in both their subsidized and unsubsidized forms[60]. Not all bread and not all flour are subsidized. Sinn (brown) bread is not subsidized.

Three-quarters of poor households benefit from purchases of baladi bread. However, a similar portion of the non-poor benefit as well. The leakage of benefits to the non-poor primarily goes to the middle class. Households in the highest quintile have noticeably lower rates of purchase than the rest of Egyptians, though a significant percent of even the wealthiest Egyptians buy baladi bread. Interestingly, class differences largely disappear in rural areas: the rural rich are more likely to buy baladi bread than the urban rich while the rural poor are less likely to buy baladi bread than the urban poor (Table C.2).

Table C. 2: Share of Household Purchasing Subsidized Food Items
(By region and expenditure quintile)

	Per capita expenditure quintile				
	Lowest 1	2	3	4	Highest 5
Baladi bread 5p					
Egypt	75.4	80.7	79.3	83.2	66.6
Metropolitan	90.8	92.0	86.4	86.3	58.4
Lower urban	93.6	89.6	91.6	90.4	74.1
Lower rural	72.2	77.7	75.1	79.2	76.3
Upper urban	84.9	85.5	87.8	83.2	64.3
Upper rural	70.1	74.5	68.1	77.3	74.6

Few households among the poor and middle classes benefit from the subsidy on 10-piaster bread, which is consumed primarily by wealthier Egyptians. In fact, only among the highest quintile are more than 15 percent of Egyptians buying 10-piaster bread (Table C.3).

[60] Both subsidized and unsubsidized versions of fino bread and wheat flour are available in Egypt.

Table C. 3: Share of Households Purchasing 10-Piaster Bread
(By region and expenditure quintile)

	Per capita expenditure quntile				
	Lowest				Highest
	1	2	3	4	5
Egypt	2.4	3.2	6.0	9.3	31.1
Metropolitan	4.9	5.8	11.8	13.0	41.2
Lower Urban	1.8	3.6	7.4	9.3	29.2
Lower Rural	2.3	1.3	2.8	5.9	10.2
Upper Urban	4.0	7.7	7.4	15.2	36.3
Upper Rural	1.8	2.7	5.4	5.7	11.9

How much benefit do the various groups receive from bread subsidies?

The fourth expenditure quintile receives the largest absolute transfer for baladi bread, because this group buys the largest quantity of baladi bread. For 10-piaster bread, the highest expenditure quintile receives the largest absolute transfer. The poor and middle class receive almost no transfer at all, because these groups buy very little 10-piaster bread (Table C.4).

Table C.4: Per-Capita Monthly Absolute Benefits to Consumers
from Baladi and 10-Piaster Bread (By expenditure quintile)

	(LE/person/month) Per capita real expenditure quintile					
Region/Item	Lowest				Highest	
	1	2	3	4	5	Overall
Baladi bread	5.27	5.32	5.45	6.34	6.06	5.69
10-Piaster bread	0.05	0.09	0.18	0.32	1.79	0.49

Although the consumption of both baladi and 10-piaster bread is lowest amongst the lowest quintile, because their total expenditures are also very low, the transfer they receive is largest relative to their total expenditures (Table C.5).

Table C.5: Per-Capita Monthly Relative Benefits to Consumers
from Baladi and 10-Piaster Bread by Expenditure Quintile

	Per capita real expenditure quintile					
	Lowest				Highest	
	1	2	3	4	5	Overall
Baladi bread	4.63	3.28	2.70	2.42	1.45	2.89
10-Piaster bread	0.04	0.06	0.09	0.12	0.30	0.12

Note: relative benefit computed as the ratio of absolute benefit to the sum of consumption expenditure and total benefits from food and implicit subsidies

Who benefits from ration-card subsidies?

Nationwide, 37 percent of the population have high-subsidy ration cards, 6 percent have low-subsidy cards and 57 percent do not have any ration card. Among the poor, 60 percent have high-subsidy ration cards, 4 percent have low-subsidy ration cards, and 35 percent do not have any ration card. The proportions are similar among the middle class. Only the highest-expenditure quintile has a significantly lower probability of holding a ration card than the others (Table C.6).

Table C. 6: Share of Households Holding Ration Cards
by Expenditure Quintile

Region/ Type of card	Per capita expenditure quintile				
	Lowest				Highest
	1	2	3	4	5
Egypt					
High-subsidy card	60	60	59	56	37
Low-subsidy card	4	6	6	5	6
No card	35	34	35	40	57
Total	100	100	100	100	100
Metropolitan					
High-subsidy card	51	42	43	47	29
Low-subsidy card	8	12	9	6	6
No card	40	46	48	47	65
Total	100	100	100	100	100
Lower urban					
High-subsidy card	59	60	59	47	34
Low-subsidy card	3	5	8	6	6
No card	38	35	33	47	60
Total	100	100	100	100	100
Lower rural					
High-subsidy card	64	61	62	63	55
Low-subsidy card	4	5	3	4	6
No card	32	34	35	32	40
Total	100	100	100	100	100
Upper urban					
High-subsidy card	46	50	56	57	39
Low-subsidy card	9	9	8	5	6
No card	46	41	36	39	56
Total	100	100	100	100	100
Upper rural					
High-subsidy card	60	68	67	62	59
Low-subsidy card	4	4	4	4	5
No card	36	28	29	33	36
Total	100	100	100	100	100

In a pattern similar to that of baladi bread, class differences in ration-card holding disappear in rural areas, where the wealthiest quintile are almost as likely to have ration cards as the poor and middle class. It is also worth noting that in Upper Egypt, the middle class is more likely to have ration cards than the poorest quintile, while the opposite is true in Metropolitan governorates[61].

Individual rationed products

The poor are more likely to purchase all ration-card products than the non-poor. This pattern is noticeably different from that of subsidized bread: both baladi and 10-piaster bread are purchased by a higher percentage of non-poor households than poor households. In other words, the rationed products are more effective in reaching the poor (Table C.7).

Table C. 7: Share of Househlds Purchasing Subsidized Food Items
by Poverty Status

	Poor	Non-poor
Baldi Bread	75.5	77.3
10-Piaster Bread	2.2	11.8
Rice	69.2	55.1
Pasta	68.2	54.7
Ghee	63.9	46.2
Cooking Oil	70.0	56.3
Beans	48.7	34.6
Lentils	33.6	23.8
Sugar	70.9	56.8
Tea	69.5	54.7

Generally, purchase of rationed products is highest among the poorest, but use remains high even for the middle class; only the highest quintile purchase the products in low numbers. For example, subsidized rice is consumed by 63 percent of the bottom quintile, 63 percent of the second quintile, 62 percent of the third quintile, and 58 percent of the fourth quintile, but drops to 41 percent among the top quintile (Table C.8).

[61] Note that rations are distributed monthly, so the survey will only capture the purchases of those who received their monthly ration during the past two weeks. The percentage within any category that receives rations will be higher than that shown. Nevertheless, the tables are useful to indicate the use of rations by different groups relative to each other.

Table C. 8: Share of Ration Card Holders Purchasing Rationed Items
(Percent)

	Poor	Non-poor
Egypt		
Rice	96.55	95.39
Pasta	95.15	95.38
Ghee	89.50	81.59
Oil	97.61	97.66
Beans	69.37	61.81
Lentils	47.70	42.64
Sugar	99.06	98.45
Tea	96.85	95.09
Metropolitan		
Rice	98.37	96.45
Pasta	93.75	93.69
Ghee	82.07	67.94
Oil	98.64	97.07
Beans	48.37	41.92
Lentils	58.15	49.73
Sugar	100.00	98.17
Tea	94.29	89.95
Lower urban		
Rice	99	98
Pasta	97	95
Ghee	93	79
Oil	98	99
Beans	76	57
Lentils	46	40
Sugar	99	99
Tea	99	97
Lower rural		
Rice	96.97	97.55
Pasta	94.74	96.33
Ghee	86.74	82.41
Oil	96.99	97.95
Beans	71.86	76.29
Lentils	52.39	57.79
Sugar	99.45	98.93
Tea	97.22	97.97

Upper urban		
Rice	98.86	93.44
Pasta	95.45	93.38
Ghee	93.86	75.28
Oil	98.86	96.95
Beans	50.68	50.92
Lentils	33.18	42.40
Sugar	98.86	98.15
Tea	95.23	94.12
Upper rural		
Rice	93	94
Pasta	96	96
Ghee	95.70	90.25
Oil	98.27	97.71
Beans	68.51	67.27
Lentils	37.08	32.31
Sugar	97.88	98.29
Tea	95.70	95.57

Rural residents are more likely than urban residents to purchase most rationed products. This is the opposite of what we observe for subsidized bread, which is more often purchased by households in Metropolitan governorates. The pattern of higher use of rationed products in rural areas holds for all quintiles, but is most strongly observed among the wealthiest.

How much benefit do the various groups receive from ration-card subsidies?

For all rationed products, the largest transfers (absolute benefits) are received by the fourth quintile, indicating significant leakage of resources away from those who need them most. This leakage is quite small for ghee, beans and lentils for all groups, making them good candidates for elimination from the subsidy program (as shown in Table C.9). While removal of these products from the subsidy system would not result in large budgetary savings, doing so would simplify ration administration and could be a painless way of beginning to reduce the number of products provided through the system.

Table C. 9: Per-Capita Monthly Absolute Benefits to Consumers
from Rationed Products (By expenditure quintile)

	(LE/person/month) Per capita real expenditure quintile					
Region/Item	Lowest				Highest	
	1	2	3	4	5	Overall
Rice	0.49	0.56	0.60	0.69	0.61	0.59
Pasta	0.25	0.31	0.33	0.36	0.30	0.31
Ghee	0.19	0.21	0.23	0.24	0.18	0.21
Oil	2.00	2.38	2.65	2.92	2.55	2.50
Beans	0.13	0.14	0.15	0.15	0.12	0.14
Lentils	0.05	0.05	0.05	0.05	0.05	0.05
Sugar	0.42	0.49	0.54	0.59	0.50	0.51
Tea	-0.02	-0.02	-0.02	-0.03	-0.02	-0.02

The pattern of *relative* benefits of subsidized ration-card items follows that of baladi bread: the subsidy constitutes a larger share of expenditure for the poorest quintiles (Table C.10).

Table C. 10: Per-Capita Monthly Relative Benefits to Consumers
from Rationed Products by Expenditure Quintile
(percentage)

	Per capita real expenditure quintile					
	Lowest				Highest	
	1	2	3	4	5	Overall
Rice	0.43	0.35	0.30	0.26	0.15	0.29
Pasta	0.22	0.19	0.17	0.14	0.07	0.16
Ghee	0.16	0.13	0.12	0.09	0.04	0.11
Oil	1.76	1.48	1.31	1.12	0.61	1.30
Beans	0.12	0.09	0.08	0.06	0.03	0.07
Lentils	0.05	0.03	0.03	0.02	0.01	0.03
Sugar	0.37	0.30	0.27	0.23	0.12	0.02
Tea	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01

Note: relative benefit computed as the ratio of absolute benefit to the sum of consumption expenditure and total benefits from food and implicit subsidies

APPENDIX D: ENERGY SUBSIDIES

Energy products are heavily subsidized. Table D.1 shows that prices of oil and gas products were 24.3 percent of their international levels in FY04 on average, with this ratio declining further to 22.5 percent in the first half of FY05, mostly due to rising international prices. The largest subsidies are for LPG, kerosene, and diesel. Though the domestic price of natural gas is also much lower than its international prices, the proper opportunity cost for natural gas is its long-run marginal cost of production, which is less than the international price.

Table D 1: Oil and Gas Prices are Very Low, Compared to International Levels
(Domestic prices relative to international prices, %)

Product	FY04	First Half-FY05
L P G	10.2%	7.5%
Gasoline 92	92.7%	72.9%
Gasoline 90	66.6%	52.3%
Gasoline 80	62.3%	49.1%
Kerosene	28.7%	19.1%
Diesel (Gas oil)	27.0%	25.5%
Fuel Oil	22.8%	31.7%
Asphalt	30.1%	28.8%
Natural Gas	18.1%	20.3%
T o t a l	24.3%	22.5%

Source: Calculated by the WB staff from data provided by the Ministry of Petroleum

Table D 2: Prices of Petroleum Products & Natural Gas

Year	Gasoline 80 octane	Gasoline 90 octane	Gasoline 92 octane	Gasoline 95 octane	Kerosene	Gas Oil	Gas Oil	Fuel Oil	LPG	Natural Gas
	PT/lit	PT/lit	PT/lit	PT/lit	PT/lit	PT/lit	PT/lit	L.E/Ton	L.E/Bottle	PT/m3
1977	-	-	-	-	-	-	-	-	0.65	-
1982	11	15	-	-	3	3	3.5	7.5	-	-
1983	-	-	-	-	-	-	-	15	-	-
1985	20	20-25 *	-	-	-	-	-	-	-	-
1986	25	30	-	-	-	-	-	-	-	-
1987	-	-	-	-	5	5	6.5	28	-	2.46
1988	35	40	-	-	-	-	-	-	-	-
1989	-	-	-	-	7	7	10	35	-	-
1990	50-55	55-60	-	-	10	10	15	50	1.5	4.67
1991	70	80	-	-	20	20	25	80	2.5	7.5
1992	90	100	-	-	30	30	35	100-130	-	9.4
1993	-	-	-	-	40	40	45	-	-	12.25
1995	-	-	-	175	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	182	-	14.1
1998	-	-	-	-	-	-	-	-	-	-
1999	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-
2004	-	-	140	-	-	-	60	250-300	-	18.6-21.0

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