

**Comparative Advantage Analysis
of the Soap Subsector
in Uganda**

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**COMPARATIVE ADVANTAGE ANALYSIS OF THE
SOAP SUBSECTOR IN UGANDA**

by

**Samir Zaman
Abt Associates Inc.**

**for the Program Office
USAID/Kampala**

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**Technical Review and Editing:
Patricia Kristjanson &
John S. Holtzman
Abt Associates
Suite 600
4800 Montgomery Lane
Bethesda, MD 20814**

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GLOSSARY

CIF	Cost, Insurance, and Freight [price of an import at port of destination]
CPI	Consumer Price Index
DRC	Domestic Resource Cost [see Page 9]
EPC	Effective Protection Coefficient [see page 27]
ERP	Economic Recovery Program
FOB	Free On Board [price paid for an export at port of origin]
GDP	Gross Domestic Product
GOU	Government of Uganda
KWH	Kilowatt-hour [of electrical power]
NPC	Nominal Protection Coefficient [see page 27]
NRA	National Resistance Administration
OGL	Open General License system [provides Ugandan producers foreign exchange for raw materials—see page 3]
PAM	Policy Analysis Matrix [see page 10]
PL 480	Public Law 480 [see page 1, footnote 1]
UEB	Uganda Electricity Board
USAID	United States Agency for International Development
USh	Uganda Shillings

Exchange Rates (July 1990–June 1991 average):

Official, 551 USh=\$1US; Parallel (private), 780 USh=\$1US

EXECUTIVE SUMMARY

The Government of Uganda (GOU) initiated a program of stabilization and structural reform to reconstruct the country's devastated economy soon after coming to power in 1986. The program's pragmatic measures have led to a marked expansion of the productive sector of the economy. USAID/Kampala, through its PL 480 Title I program, has helped to restructure the soap industry from a parastatal monopoly to an industry based largely in the private sector.

This conversion has been accomplished by providing tallow to a private soap producer, Mukwano Industries. Mukwano used most of the tallow for its own production needs, but as a GOU-appointed implementing agent of the Title I program, it was also required to distribute tallow to other private firms that wanted to buy it. Today Uganda fills almost all its domestic demand for bar soap with locally produced soap, almost 90 percent of which is produced by Mukwano.

The high proportion of the country's scarce foreign exchange that is allocated for soap production, the various explicit and implicit incentives extended to the industry, and Mukwano's emergence as a monopolistic entity have all contributed to the need for a close examination of the soap industry and an analysis of the country's economic efficiency in producing soap.

The objectives of this study are to (1) determine the financial feasibility of the soap industry in Uganda; (2) determine the level of protection enjoyed by the industry; (3) determine the comparative advantage of the industry; and (4) make cost of production and efficiency comparisons among currently producing plants.

The study looked at the cost structures of three soap producers and made economic and financial comparisons among them and also against the price of a foreign bar soap of similar quality. The study uses Domestic Resource Cost (DRC) methodology to determine comparative advantage, and the Policy Analysis Matrix (PAM) to show divergences between financial and economic costs.

Findings of the Study

- Soap is an important consumption item in Uganda. For low-income consumers, it represents the third largest non-food expenditure and also by far the most frequently transacted item in rural areas.
- The soap industry employs the fourth largest number of people in the manufacturing sector.
- Among Uganda's industries, the soap subsector uses the second largest amount of foreign exchange under the official rate.
- The cost of producing a bar of soap varies from USh 266 to Ush 300 among the three producers.

- Imported raw materials constitute between 72 percent and 83 percent of the cost.
- Taxes constitute 13 percent of soap production costs.
- The largest variations in the cost structure (especially economic cost) among producers occur in the fixed cost category.
- Two of the three firms surveyed are financially solvent. The third does not show a profit at present due to high financing costs.
- The firm currently producing soap with bulk tallow would not have a cost advantage over currently solvent producers if they too converted to bulk tallow.
- Economically all three firms surveyed are viable. Each shows significant net social profit.
- At current prices, Uganda enjoys a comparative advantage in soap production, which it would lose if the international price of soap dropped by 10 percent or more.
- A producer's decision on whether to use bulk tallow or drummed tallow is extremely important. Producers could reduce their average cost of production, even if they increased their fixed investment, by an additional 10 percent if they converted from drummed tallow to bulk tallow.
- Producers do not receive any nominal protection on the output side. On the input side they receive sizeable nominal protection. The net effect is no effective protection. Overall, government intervention in the soap industry helps consumers more than producers, however.

Recommendations of the Study

- The PL 480 program should continue to import bulk tallow, which producers should be encouraged to use.
- Smaller producers could be provided with technical assistance and access to financing to develop bulk handling capacity.
- PL 480 tallow should be equally accessible to all producers.
- The possibility of importing bulk palm fatty and palm stearin should be explored.
- Administrative control over prices should be withdrawn, because it leads to inefficient use of resources. The current market price is lower than the government-set price. The ex-factory prices of almost all producers are lower than Mukwano's price.

1. INTRODUCTION

When Uganda achieved independence in 1961, it was one of the most promising countries in Sub-Saharan Africa. Apart from climatic and soil conditions which favored agricultural growth, it had a relatively well-developed manufacturing sector and an efficient transportation system. In the first decade after independence, Uganda realized some of its potential. GDP grew at an average annual rate of almost 6 percent, and the inflation rate remained low. A relatively liberal export regime contributed to diversification of exports and frequent current account surpluses. This progress ended in 1971, however, when Idi Amin seized power. Over the next 15 years Uganda experienced severe political strife and gross economic mismanagement. Chronic inflation exceeding 100 percent in some years and a decline of some 20 percent in real GDP were among the consequences.

The present Government, the National Resistance Movement, initiated a program of stabilization and structural reform soon after coming to power in 1986. The main objectives of the Economic Recovery Program (ERP) were price stability, a sustainable balance of payments, high capacity utilization in industry and agriculture, improved producer incentives, and more efficiency in the public sector. Bold, pragmatic measures taken in the last five years, accompanied by growing political stability, have expanded productive capacity and stimulated economic activity.

To assist the Government of Uganda (GOU) with its ERP, USAID initiated a PL 480 Title I program in 1988.¹ Based on the GOU's priority ranking of essential commodities, USAID/Kampala and the GOU agreed that tallow for the soap industry was the critical commodity contribution which the U.S. Government could make through the Title I program.

The Title I program has helped the soap industry increase production so that it now meets most of the country's domestic requirement for soap. In addition, the Title I program has helped to move the soap industry away from a Government-owned parastatal system of production/distribution toward private sector control, mainly by providing tallow (a primary ingredient in soap) to a Ugandan firm. This private firm has thus had a steady supply of tallow, as well as lower raw material costs than its competition due to its bulk handling capacity; it now produces 90 percent of Uganda's soap. This tallow is being provided at the world price, but the GOU allows producers to use Uganda shillings to purchase it at the official government rate.

¹ PL 480 is a vehicle for transferring surplus American agricultural products to developing countries through low interest loans and direct donations. Title I provides long-term, low-interest loans for the purchase of U.S. agricultural commodities in exchange for the recipient's use of local currency proceeds from the sale of these products to finance self-help measures and other development projects.

To encourage domestic production of soap, the GOU has levied excise duties on imported soap products and refused to allocate foreign exchange at the official rate for soap imports. Tallow and other raw materials imported by the soap industry at the official exchange rate are often overvalued by 40 percent or more. An overvalued exchange rate means that these imports cost less in domestic currency terms than they would under a more competitive market exchange rate policy.

In 1991, USAID/Kampala designed a one-year PL 480 Title III program² to replace the Title I program that has been supplying tallow. The objectives of this program are to promote competition in the industry by providing tallow to several soap producers, and to help complete the process of effecting GOU policy changes, including the total price deregulation necessary to support a soap subsector completely based in the private sector. The Mission is currently designing a three-year follow-on program using Title III tallow which they believe will complete the privatization process.

The various protections extended to the soap industry, and industry domination by a single private sector firm, led USAID/Kampala to commission this study to address the following questions:

- Is soap being produced efficiently in Uganda?
- What kind of protection does the industry enjoy?
- Given the current set of incentives and disincentives, can the industry compete with external producers?
- Do the soap producers differ significantly in production efficiency?
- What policy measures should be considered to make soap production more efficient?

Chapter 2 describes the evolution of the soap industry in Uganda. Chapter 3 covers the methodology of the study in detail, providing the background that will enable other analysts to conduct similar comparative advantage analyses. Chapter 4 presents the analysis and findings. Conclusions and recommendations are examined in Chapter 5.

² Through PL 480 Title III, A.I.D. provides grants for the purchase of U.S. surplus agricultural commodities in support of development goals determined mutually by the donor and the host country.

2. THE SOAP SUBSECTOR IN UGANDA

Soap³ is an essential commodity in Uganda. Its important role is reflected in both the level of household consumption of soap and the degree of government administrative control over the commodity. In the recently calculated consumer price index (CPI) for middle-income consumers, soap ranks fourth (8 percent) in consumption. Only clothing, beer, and plantain (known as matooke--a staple in the Ugandan diet) rank higher than soap. For low-income consumers, soap is the third largest non-food expenditure, following rent and transportation. In the rural community, soap is by far the most common commodity transaction. Given the importance attached to soap and the fact that a single industry dominates the subsector, the Government is reluctant to withdraw all administrative control. Production costs at the leading firm are reviewed by the Government based on a formula for essential inputs to ensure that the ex-factory price is fair to both the producer and consumers. The Government does not ban soap imports, but foreign exchange cannot be obtained at the official rate for the importation of soap.

Soap also holds an important position in the manufacturing sector of the Ugandan economy, ranking third behind cigarettes and textiles on the index of industrial production. It has the fourth largest number of employees in the sector and the second highest expenditure on wages. A large proportion of foreign exchange allocated for imported inputs under the Open General License (OGL) system (which provides foreign exchange for raw materials at a government-determined, subsidized exchange rate) goes to the soap industry. The OGL and the Special Import Program are the two main donor-supported programs that provide foreign exchange to the industrial sector. Tallow is imported under the PL 480 program, which provides this commodity to the GOU in the form of a grant. The tallow is sold by government at world market prices at the official rate of exchange to private soap manufacturers. It is imported at cost to producer firms equivalent to the world price of tallow.

Historically, Uganda produced enough soap to meet domestic demand. Before 1972, soap was produced industrially, primarily by local Asian firms. After the Asians were expelled in 1972, the factories closed down or operated under other management arrangements. Then the Lint Marketing Board, a parastatal, took over 18 soap factories in 1974, controlling both the production and the distribution of soap. Inefficiency and mismanagement led to the closure of many of the factories, and by 1986 only 13 percent of the estimated capacity was being used. In that year, a new company called Mukwano Industries started operations, soon becoming the largest producer of soap. The NRA Government invited the Asians back, promising to return their properties, and two former soap factory owners have reclaimed their factories since 1987.

Production has expanded many times over from the low level of 1986. Table 2.1 lists the major producers, 1990 production levels, and operational capacity. The table shows that only about 54 percent of the operational capacity in the country is being used.

³In Uganda, the word "soap" generally refers to bar soap used for washing clothes, cleaning, and bathing. It is in this context that the word is used in this report.

TABLE 2.1

Soap Production and Capacity Utilization in Uganda

Producer	Installed Capacity Tons/Year	Operation Capacity Tons/Year	1990/91 Production Tons/Year
Mukwano	43,000	37,581	31,200
Mbale	7,500	6,250	2,500
Madhvani	12,586	11,000	100
Nakasero	23,000		
Lint Marketing Board—Iganga	3,600	500	333
Hosi	4,500	3,000	20
Mawokota	2,700	1,800	45
General Mills	960	960	0
P. Senfuka	1,100	880	0
Super Soap	2,000	1,296	60
Otwepa	2,450	2,141	814
Total	103,396	65,408	35,072

Mukwano dominates the present market, producing almost 90 percent of Uganda's soap. Mukwano achieved its preeminent position in the industry by investing in facilities to import tallow in bulk rather than in drums and by taking advantage of the PL 480 Title I program, which enabled the firm to purchase tallow more cheaply than its competitors. Bulk tallow costs almost 20 percent less than drummed tallow.

This type of market domination by one or several firms is not limited to the country's soap industry. Many other industrial sub-sectors, such as grain milling, tea, plastics and metal works, are dominated by a single producer.

Competition and production are expected to increase in the soap industry, however, as new companies emerge, factories are repossessed by their former owners, and established companies convert to bulk tallow.

Uganda's soap plants are spread out across the country, but most production comes from plants in and around Kampala. The level of technology varies from completely manual to almost fully automated. In the former, the ingredients are mixed manually in vats over wood-burning stoves. The soap base is then transferred to molds for cooling and stamping. These plants use very little machinery. Most plants currently producing soap mix the solution mechanically over electrical or fuel-burning furnaces. The soap solution is conveyed to a machine that transforms the soap base into a long continuous strip, which is stamped and cut into 800-gram bars. At

Mukwano, the largest producer, each stage of production—from raw material unloading to soap stamping—is done automatically in one continuous process by modern, sophisticated equipment. The finished bars are packaged manually in boxes of 25 as at most other plants.

More than 60 percent of the body weight of soap comes from fatty substances. Caustic soda, sodium silicate, and moisture make up the remainder. In Uganda, tallow is used primarily to provide the fat in soap. Some producers use palm fatty and palm stearin. Tallow or palm products can be obtained in drums or in bulk form. Since fats solidify at low temperatures, considerable investment in special storage and pumping facilities is needed to handle bulk fat. This high cost necessitates a minimum level of usage in order to remain feasible.

The distribution of soap is completely privatized and not controlled by the Government. Some companies, including Mukwano and Mbale, distribute throughout the country, while others limit distribution to the area around their production plant.

On the consumption side, no thorough market studies of the soap industry have been conducted in recent years. According to a report prepared by the National Renderers Association,⁴ soap consumption in Uganda in the late 1960s averaged around 3.1 kg per capita annually. If that were the level of consumption today, total annual consumption would be 56,000 metric tons. Currently, less than 35,000 tons of bar soap is sold in the retail market. The soap producers interviewed indicated that they have no difficulty selling the product they produce at their asking price. In fact, the firms visited for this study had very little inventory. They also mentioned that more soap could be sold at the current price. The lack of raw materials and capital is often cited as the reason for not increasing production.

The real price of soap has decreased in the last 3 years. The assessment team for the 1988/90 PL 480 Title I programs estimated that the retail price of soap has risen from USh (Uganda shillings) 300 in the fourth quarter of 1988 to USh 379.2 in the first quarter of 1991, a 26 percent increase. This is considerably less than the 368 percent increase in the government exchange rate, the 179 percent increase in the parallel exchange rate, and the 124 percent increase in the CPI (i.e., general price levels).

Much of the decrease in the real price of soap is due to the lower cost of production resulting from higher capacity utilization and the increase in production, but the marketing margin has also declined dramatically. The difference between the ex-factory price (the price as it leaves the factory) and the retail price charged (i.e., the marketing margin) declined from 36 percent in 1987 to 25 percent in 1991. The PL 480 assessment team mentions that the provision of tallow at the official rate of exchange and Mukwano's ability to use bulk tallow under the PL 480 Title I program have changed the structure of the soap industry. Today, the Uganda soap industry fills virtually all the domestic demand for bar soap.

⁴ The National Renderers Association, an organization of U.S. tallow and meat meal producers, conducts research and education programs, and provides market development and lobbying services.

3. METHODOLOGY

An industry's capacity to produce efficiently and compete internationally depends on several types of factors. These include microeconomic and cost of production factors, domestic macroeconomic and policy factors, and international market conditions. Figure 3.1 illustrates these major determinants of competitiveness. This study focuses on the microeconomic and government policy factors responsible for competitiveness (or lack of it) in Uganda's soap industry. The scope of the study did not include an analysis of the dynamics of the international market (e.g. supply and demand conditions for the soap industry in other producing countries).

The analysis focuses on competitiveness issues from two perspectives—that of the economy as a whole (efficiency) and that of the individual firm (profit). The concept of comparative advantage is used to measure the country's economic efficiency in producing soap, while at the level of the firm, financial profitability reveals a firm's ability to continue producing soap, given the current distortions in the economy resulting from government policies and market failures.

3.1 Conceptual Framework

A comparative advantage analysis essentially seeks to answer the following question: which production activity is relatively most efficient for a given country, ignoring the effects of distortions in the economy resulting from government policies and market failures? Relative efficiency in production (i.e., comparative advantage) depends on three factors:

- 1) Technology, which determines production possibilities and influences rates of product transformation;
- 2) The resource endowment, which determines the value of land, labor, and capital; and
- 3) International prices, which determine the value of all other inputs and outputs (Morris, 1989).

This study employs the Domestic Resource Cost (DRC) methodology (defined below) to measure the comparative advantage of soap production in Uganda. In the process of estimating DRC ratios, several other indicators are computed to measure the divergence of the market from the "efficient" or non-distorted optimal resource allocation. These indicators are examined within the framework of the Policy Analysis Matrix (PAM) methodology developed by Pearson and Monke (Pearson and Monke, 1987).

The DRC methodology has been widely used to measure comparative advantage, because it generates quantitative indicators of the efficiency of using domestic resources to produce a given commodity, as measured against that of importing it. The DRC ratio compares the value of domestic resources used in the production of a good to the value of foreign exchange saved

FIGURE 3.1

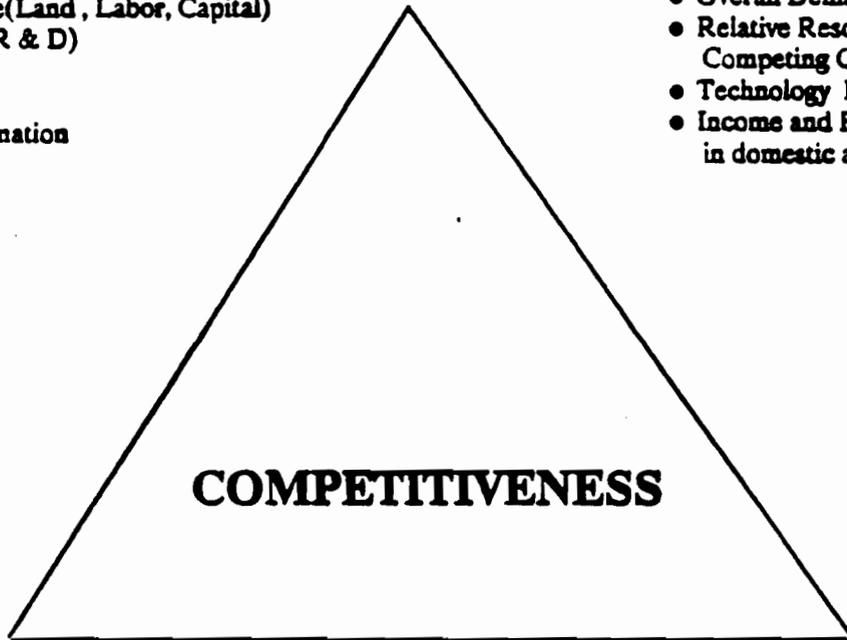
DETERMINANTS OF COMPETITIVENESS

Microeconomic Factors (Structural / Institutional)

- Cost of Production/Efficiency
- Marketing Cost/Efficiency
- Quality/Product Differentiation
- Resource Base(Land , Labor, Capital)
- Technology (R & D)
- Extension
- Infrastructure
- Market Information
- Alternatives

International Commodity Markets

- World Markets
(Structure, Conduct, Performance)
- Market Shares
- Overall Demand; Changes in Tastes
- Relative Resource Endowments in
Competing Countries
- Technology Development
- Income and Population Growth
in domestic and foreign markets



COMPETTIVENESS

Domestic Policies

- Macroeconomic
Agricultural Sector
- Fiscal and Monetary Policy
 - Exchange Rates Policy
 - Trade Policy
 - Price Policies
 - Marketing Policies

by not having to import the commodity. The costs of domestic resources, or non-tradable inputs, are measured in economic terms (opportunity costs), while tradable inputs are priced at international prices. DRC ratios for the soap industry can be calculated according to the formula given below:

$$DRCs = \frac{\sum (wL + Kr + NTOc)}{P_s Q_s - \sum P_i T_i}$$

Where

DRCs	=	Domestic Resource Cost Ratio for soap
L	=	Quantity of labor used in production
w	=	Opportunity cost price of labor
K	=	Quantity of capital used in production
r	=	Social rate of capital investment
NT	=	Quantity of non-tradable inputs
Oc	=	Opportunity cost of non-tradable inputs
P _s	=	World price equivalent of soap
Q _s	=	Total Quantity of soap produced
T _i	=	Quantity of tradable inputs used
P _i	=	World price equivalent of tradable inputs

A country has a comparative advantage in producing a commodity if the DRC ratio is positive but less than one. This ratio implies that the opportunity cost of domestic resources used to produce an incremental unit of the commodity is less than the foreign exchange earned (in the case of exported goods) or saved (in the case of imported goods). A DRC ratio of more than one for soap produced in Uganda would indicate that the economic value of the domestic resources used to produce soap exceeds the value of the foreign exchange used to import soap, and the country could save foreign exchange by importing the commodity rather than producing it. A negative DRC ratio suggests that more foreign exchange is used to produce the commodity than the commodity is worth.

The DRC analysis begins with the development of an enterprise budget for the production of a commodity, in this case soap. This involves determining the cost to a producer using a particular technology for producing soap, and the revenues earned from selling it. The difference between his revenues and costs demonstrates the financial profitability of producing soap. At the individual firm level, beyond straight profit calculations, management is also interested in whether producing that particular good will give a higher return than producing other goods. Other indicators of financial viability include the operating ratio, return on sales, and return on equity. The operating ratio is an indicator of the ability of management to control operating costs including administrative costs. It indicates the proportion of accounts receivable (sales) that an entrepreneur needs to be able to mobilize in short order to ensure operation of the

firm without disruption. The return on sales shows the profit a firm makes for every dollar value it sells. The return on equity measures payment for investment. The firm can compare the rates of return for alternative investments.

Beyond financial profitability is the issue of economic efficiency or comparative advantage of the production system. One advantage of the DRC methodology is that it takes the financial enterprise cost calculations one step farther by attempting to determine the true opportunity cost of the factors of production (land, labor, and capital). The opportunity costs of inputs and outputs in the production process are represented by economic or social prices (also called shadow prices). These prices are intended to reflect what the true economic value of goods and services would be in the absence of government policies such as taxes, subsidies, import tariffs, quotas, and price controls. For example, if the key ingredient in soap manufacturing (tallow) was found to be heavily subsidized in Uganda, it would make sense to the individual firm to produce soap. From the country's point of view, however, the cost of the subsidy would have to be considered before making this determination.

This study uses the PAM to present and interpret research results. PAM allows analysts to incorporate the cost and revenue structure of an activity (enterprise) in a relatively simple framework. In the words of Pearson and Monke, "PAM is a product of two accounting identities--one defining profitability as the difference between revenues and costs, and the other measuring the effects of divergences (distorting policies and market failures) as the difference between observed parameters and parameters that might exist if the divergences were removed..." (Pearson and Monke). Table 3.1 shows an illustrative PAM with definitions of the various measures of comparative advantage and economic and financial viability.

3.2 Data Requirements

DRC analysis begins with data on the cost structure of the production units in the form of enterprise budgets for the production possibilities being compared. Since we are attempting to estimate the value added to tradable inputs and also isolate divergences due to interventions, the enterprise budgets must be fairly disaggregated to permit accurate accounting of all types of inputs and output.

The lack of input/output tables⁵ for Uganda meant all production and cost data had to be collected from primary sources. This task was complicated for a number of reasons. Because of government administrative review of production costs for the leading firm, and income taxes, producers were cautious about reporting profits, tending to inflate cost and underestimate output levels. It was difficult to verify and compare some of the data collected. Two or more interview sessions had to be arranged with each producer so that anomalies in the data could be cross checked and clarified.

⁵ An input/output table describes production coefficients of all goods produced in a country. In the case of soap, it would list the amount of various factors of production used to produce soap.

TABLE 3.1

ILLUSTRATIVE POLICY ANALYSIS MATRIX

Types of Measures	REVENUE	COSTS				Total Costs	PROFIT
	Tradable	Tradable Input Cos	Labor Cost	Capital Cost	Other Dom Costs		
Financial	A	B	C	D	E	F	G
Economic	H	I	J	K	L	M	N
Policy Effects/ Divergences	O	P	Q	R	S	T	U

Notes: F = Total private cost, or (B+C+D+E)
M = Total social cost, or (I+J+K+L)

G = Private profit, or (A-f)
N = Social profit, or (H-M)

O = Transfer through policies affecting output price,
or (A-H), or Nominal Protection Coefficient (A/H)

P = Transfer through policies affecting raw material prices,
or (B-I)

Q = Transfer through policies affecting labor, or (C-J)

R = Transfer through policies affecting capital, or (D-K)

S = Transfer through policies affecting non-tradables, or (E-L)

T = Total transfer through policies affecting inputs, or (F-M)

U = Total transfer resulting from policies affecting the industry,
or (G-N), or Effective Protection Coefficient (G/N)

Value Added (Financial) (A-B)

Value Added (Economic) (H-I)

Profitability Coefficient (G/N)

Subsidy Rate to Producers (G-N)/N

Nominal Protection Coefficients

a. Outputs A/H

b. Inputs B/I

Effective Protection Coefficient (A-B)/(H-I)

Private Cost Ratio (C+D+E)/(A-F)

Domestic Resource Cost Ratio (J+K+L)/H-I

Plant level data were collected from a number of soap manufacturing companies which together account for more than 95 percent of the current soap production and 60 percent of the installed capacity in the country. Representatives from these plants were interviewed to obtain a realistic concept of the proportion of raw materials and other inputs used in soap production. Price information was collected from the producers and compared with information published in trade journals after adjustments for transportation and handling charges were made.

The enterprises where interviews were conducted represent three distinct production technologies or processes for soap manufacturing in Uganda. Firm I, the largest concern, enjoys major economies of scale and commands a major share of the market, in part because it is able to import tallow, its main raw material, in bulk. Located in Kampala, Firm I distributes its product throughout Uganda. Firm II is based 130 miles east of Kampala in Tororo District, its primary area of distribution, although it also distributes in Kampala. Firm II is the only firm that uses the cold process mixing technology. It imports tallow in drums. Firm III, located 180 miles northeast of Kampala in the town of Mbale, uses palm stearin rather than tallow as the soap base. It distributes its soap widely. Also examined in this study is Madhvani Soap Industry, a former leading soap producer which is currently trying to re-enter soap production.

The form used to collect data was described to relevant administrators and financial managers of the firms who were then asked to provide the data. A few days later the completed forms were collected and the officers interviewed to verify the data and fill in any missing information. The data was used to construct budget sheets for the three enterprises. Financial and economic analyses were conducted using these budget data.

3.3 Conversion of Financial Costs and Revenues into Economic Costs and Returns

Section 3.2 describes the process of collecting financial data for the three soap manufacturers. It explains the procedures used to convert the financial costs into economic or opportunity costs, and financial/private profit calculations into economic/social profit measures.

3.3.1 Separating Items into Tradables and Non-tradables

All line items on the budget sheets are categorized as tradable or non-tradable. This distinction is necessary because, as mentioned earlier, domestic resource cost ratios are calculated as the ratio between the total opportunity cost of non-tradables (primary factors of production including land, labor, and capital) and the value added to tradables. Tradables are defined as goods that either are traded internationally or could be so traded. Economic prices are often determined differently for tradable and non-tradable factors. Some non-traded goods are composite goods comprising both tradable and primary factors. For example, hydro-electricity comes from both water power, which is non-tradable, and machinery, which is tradable.

Once costs are broken down into tradables and non-tradables, they are valued to reflect social prices. Social prices are intended to reflect the true economic value of goods and services in the absence of taxes, subsidies, tariffs, price controls, and other government controls.

3.3.2 Pricing of Tradables

Tradables are valued at their world price equivalent in domestic currency after adjustment for inland transport costs and exchange rate anomalies. For imports, domestic transportation and handling costs are added to the C.I.F. price to obtain the social price equivalent of the import parity price. For exports, domestic transportation and handling costs are subtracted from the F.O.B. price to get the social price equivalent of the export parity price.

In calculating social prices for tradables, it is necessary to estimate a shadow exchange rate for converting between domestic currency and international currencies. Distortions in the exchange rate affect the domestic price of tradables. For example, an overvalued exchange rate means imported goods are cheaper in domestic currency terms.

In this analysis, the FOREX Bureau rate is assumed to reflect the shadow exchange rate in Uganda. FOREX Bureaus are private agencies that are licensed to buy and sell foreign currencies on the open market. The premium used to adjust for any commodities imported using currency converted under the official subsidized rate (i.e., under OGL or SIP) is computed as the ratio of the average FOREX rate and the government rate for the FY 1990.

3.3.3 Pricing of Non-tradables

Determining social prices for non-tradables including land, labor, and capital is more complex than pricing tradables. The social prices of primary factors should have values equal to their opportunity costs (i.e., the value of their most socially profitable alternate use). Without any distortion in the economy, the market price would represent the social price. In this study, a number of conversion factors (reflecting the estimated degree of distortion in the economy) were used to adjust market prices. The assumptions underlying the conversion factors used to arrive at social/economic prices of non-tradable inputs are described below:

Conversion Factor for Labor. Labor markets become distorted for a number of reasons. For example, minimum wage legislation can raise the market price of labor above the true marginal value. In Uganda, the distorting factors include a trade union dictated wage in a rapidly increasing population in primary cities, coupled with high unemployment and underemployment in the urban sector. This situation has resulted in market wage rates for unskilled labor that are higher than the true opportunity cost. The conversion factor estimated by the Bank of Uganda in its study entitled, "Comparative Advantage and Competitiveness of Uganda's Agricultural Exports," was used to adjust wages of unskilled and clerical workers in our study. The Manpower Planning Department at the Ministry of Planning and Economic Development estimates that even if there are future shortages of skilled and professional manpower, other labor resources will be in considerable surplus (Manpower and Employment in Uganda: Report of the 1988 National Manpower Survey). The market rate of wages for skilled labor was assumed to reflect the true opportunity cost in the absence of labor market distortions facing skilled workers.

Opportunity Cost of Land. Wherever possible, the rental value of land was used as the opportunity cost of land. The rental value for land in industrial production is low and therefore not very significant.

Opportunity Cost of Capital. In Uganda, the high inflation rate needs to be taken into account in order to estimate the real rate of interest (i.e., the cost of capital). The social rate of return was assumed to be 15 percent.⁶

3.3.4 Adjusting Direct Transfer Payments

Direct transfer payments, including taxes and subsidies, are payments or receipts representing the transfer of claims to resources from one person to another. These transfer payments need to be eliminated from the financial accounts in order to determine economic values. Similarly, all credit transactions should be subtracted.

3.4 Sensitivity Analysis

Sensitivity analysis is used to simulate impacts of changes in policy and factor prices on competitiveness. Assumptions have to be made in order to estimate social prices, and sensitivity analysis entails changing some of the underlying assumptions and observing how these changes affect the competitiveness of the production system. For example, how does a reduction in wages affect the firm's comparative advantage position? Sensitivity analysis was undertaken to test changes in output and input prices, exchange rate, and also changes in capacity utilization. The results are given in Section 4.5.

⁶ In the absence of studies that estimate opportunity cost of capital, we used an estimate of 15 percent, which represents the higher end of the range (12 to 15 percent) of the rate of return for capital believed to be applicable to low-income countries (Gittinger).

4. ANALYSIS AND FINDINGS

The PAM is used to provide a framework for analyzing the effects of policy and institutional distortions on competitiveness, as well as the comparative advantage of competing enterprises or technologies. This chapter compares private and social profitability in order to disclose differences in interests between the individual firms and the nation as a whole. For example, a product can be profitable to a firm (e.g. because of subsidies on inputs), even though production of the product may not represent an efficient use of resources for the country.

4.1 Cost of Production Data Used in Analysis

Because cost of production data are not published for the Ugandan soap industry, production costs and input/output coefficients were collected from the producers themselves. Three firms were chosen for the analysis, based on three factors: 1) they are currently in operation; 2) they all produce virtually the same product; and 3) they use different production processes. Firm I uses bulk tallow as the soap base; Firm II uses drummed tallow; and Firm III uses palm oil and palm stearin.

The production data were collected through personal interviews at the three firms. Prices were verified with traders and published sources wherever possible. Some adjustments were made to certain figures in order to reflect quality differences. After consulting with managers and soap technicians from four firms, the following percentages of ingredients were accepted as a standard to provide a uniform and consistent quality bar soap:

Fatty substances (tallow, palm stearin):	64 - 68 percent
Caustic Soda:	8 - 10 percent
Sodium Silicate:	8 - 10 percent
Moisture:	12 - 20 percent

Reported figures for capital, labor, and intermediate inputs were not adjusted. The cost of fixed assets such as machinery and buildings were represented by the purchase price, adjusted by the ratio of the official exchange rate in the year of purchase to the official exchange rate in the current year (i.e., average of July 1990 to June 1991). This provides an approximate current replacement value for fixed assets. The average exchange rate for the last 12 months was used as the current indicator of the exchange rate because all other prices used in the analysis represent averages for the same period.

Data on prices of raw materials, intermediate inputs, and exchange rates were collected from a number of different sources. Table 4.1 shows prices of raw materials and the final product, soap. Table 4.2 shows the average monthly exchange rate from July 1990 to June 1991. Table 4.3 shows the cost of electricity, a major intermediate input in soap manufacturing.

Detailed cost data were collected from three manufacturers. The data were disaggregated into the following cost categories: fixed assets, labor, intermediate inputs, raw materials, land, and administration. Information was collected regarding taxes on raw materials and the final product, but income taxes were not included in the analysis. This information was used to compute the total cost incurred and revenue earned for each 800-gram bar of soap produced. Table 4.4 presents the financial and economic cost and revenue data for the three producers surveyed. Prices in this table reflect averages from July 1990 to June 1991.

4.2 Financial Analysis/Private Profitability

Financial returns of the firm using bulk tallow were compared to returns of the other two firms. Realistically, Firm I can be expected to continue to dominate the market and determine the output price for some time to come, although increasing competition may force it to produce more efficiently.

The cost of producing a bar of soap at Firm I is US\$ 276 at the average 1990-91 prices (approximately \$0.35 at the August 1991 market rate of exchange), compared with US\$ 300 and US\$ 266 at Firm II and Firm III respectively (see Table 4.4). Raw materials account for the bulk of the cost of producing soap. The purchase of raw materials makes up almost 73 percent of Firm I's total cost. Fatty substances account for approximately 72 percent of the raw material cost, with tallow representing the bulk of this cost category (57 percent). Firm I also uses palm fatty and palm stearin to augment the fat content in its soap. Caustic soda and packing materials together account for 25 percent of the cost of Firm I's raw material, almost all of which is imported. One of the firms produces sodium silicate and packing material from both imported and local materials obtained at a sister plant.

Other soap producers spend more on raw materials (Firm II, US\$ 215, and Firm III, US\$ 221) than Firm I (US\$ 201). However, raw materials consume a smaller portion of Firm II's budget (72 percent). Firm III spends 83 percent of its budget on raw materials. For both Firm II and Firm III, fatty substances comprise about 75 percent of their raw material costs; they import all their raw materials.

Import duties and sales taxes are the second highest expense for all producers, with around 13 percent of the cost of soap production attributed to taxes. Labor and intermediate inputs each account for 2 to 4 percent of total cost for all producers. The cost of land is less than 1 percent of total cost. Neither Firm III nor Firm I spends much on sales, or general administration and financing (between 1 and 2 percent), compared to between 5 percent and 9 percent, respectively, for Firm II. As a relatively new entrant to the market, Firm II has a higher burden of debt and needs to allocate a substantial amount of money to introduce its soap to the market. While the others pay virtually no insurance, almost 5 percent of Firm II's total costs are insurance premiums.

TABLE 4.1

IMPORT PARITY PRICE OF SOAP AND ITS INGREDIENTS
(U.S. Dollars per Metric Ton)

Description	Tallow U.S.Fancy Bleached	Palm Fatty R.B.D.	Palm Stearin R.B.D.	Caustic Soda	Silicate	Packing Material	Bar Laundry Soap
FOB Price	283	290	245	534	177	342	554
Ocean Freight	65	35	35	(CIF)	(Kenya)	(Kenya)	(Kenya)
Clearing & Forwarding (in Mombasa)	6	6	6	6	0	0	0
Port Storage (Mombasa)	12	12	12	12	12	0	0
Drumming & Handling	0	105	105				
Transport to Kampala*	125	137	137	77	77	77	77
Total Bulk (Ex Kampala)	491	585	540	617	254	419	631
Import Tax	49	58	54	62	25	42	63
Sale Tax	54	64	59	68	28	46	69
Drumming & Handling	105	0	0	0	0	0	0
Total Drummed W/O Taxes (Ex Kampala)	596	585	540	617	254	419	631
Total Drummed With Taxes (Ex Kampala)	699	708	653	747	307	507	763

Note: transport cost of tallow and palm oil reflect a 30 percent increase over the present rate due to a proposed change in transport law in Kenya.

Sources: Oil World Annual 1991, April 1991
National Renderers Association Report, July 1991
Local Traders

TABLE 4.2

**AVERAGE MONTHLY EXCHANGE RATES
JULY 1990 TO JUNE 1991
(Ush per US\$)**

	Official	Parallel Forex Bureau	Ratio Govt/Para.
July	440	637.4	0.69
August	442.2	697.2	0.63
September	465	730.9	0.64
October	480	725.3	0.66
November	503.2	750.5	0.67
December	531.4	768.5	0.69
January	563.2	778.2	0.72
February	586.5	787	0.75
March	608	814.7	0.75
April	635.6	847.2	0.75
May	667.3	888.3	0.75
June	689	938	0.73
Average 12 Month	550.95	780.27	0.71

Source: Bank of Uganda

TABLE 4.3
PRICE OF ELECTRICAL POWER
IN THE REGION

	US Cent Per KWH
Botswana	5.9
Cameroon	17.7
Ethiopia	7.3
Ghana	3.8
Kenya	17
Liberia	14
Malawi	14.8
Mali	18.3
Sudan	9.3
Tanzania	10.4
Uganda	2.33
Average	10.98

**Note: Uganda exports power
to Kenya @US\$ 3.18/KWH**

Source: Uganda Electrification Board

TABLE 4.4
COST OF PRODUCTION AND PRICE OF
BAR SOAP IN UGANDA

	FIRM I		FIRM II		FIRM III	
	Using Bulk Tallow		Using Drum Tallow		Using Drum Palm Prod	
	Financial Values(US\$)	Economic Values(US\$)	Financial Values(US\$)	Economic Values(US\$)	Financial Values(US\$)	Economic Values(US\$)
A: Ex Factory Price *	302	394	295	394	304	394
B: Capital Stock:						
Storage Facil	0.0	0.0	0.0	0.0	0.0	0.0
Loading Facil	0.0	0.0	0.0	0.0	0.0	0.0
Machinery	13.4	23.4	5.5	11.8	3.9	6.8
Buildings	7.5	13.8	5.6	11.2	2.1	3.8
Furnishings	0.6	1.0	0.1	0.2	1.3	1.9
Tools	4.3	7.6	0.2	0.4	2.0	3.5
Office Eqp	0.5	0.9	0.0	0.0	0.0	0.0
Total Capital Cost	26.3	46.6	11.4	23.6	9.2	16.0
	9.5%	13.1%	3.8%	7.0%	3.5%	4.8%
C: Labor force:						
Manager/Adm	2.8	2.7	3.7	3.7	1.1	1.1
Supervisors	0.8	0.8	1.3	1.3	0.5	0.5
Skilled lab	4.3	4.2	3.8	3.8	2.4	2.4
Unskilled	3.9	3.4	1.4	1.2	1.6	1.3
Total Labor Cost	11.9	11.2	10.1	9.9	5.7	5.3
	4.3%	3.1%	3.4%	3.0%	2.1%	1.6%
D. Intermediate Inputs:						
Electricity	0.6	1.0	0.3	0.5	0.0	0.0
Gas	0.0	0.0	0.5	0.0	0.0	0.0
Furnace Oil	3.5	5.9	0.0	0.0	1.2	2.0
Water	1.1	1.1	0.0	0.0	0.0	0.0
Spare Parts	2.4	3.8	0.0	0.0	1.3	2.1
Other (Specify)	0.0	0.0	0.0	0.0	1.3	1.3
Tot Cost of Int.Inp.	7.6	11.8	0.8	0.5	3.7	5.4
	2.8%	3.3%	0.3%	0.2%	1.4%	1.6%

* The financial price (ex-factory price) does not include tax on soap.

TABLE 4.4 (cont'd)

**COST OF PRODUCTION AND PRICE OF
BAR SOAP IN UGANDA**

	FIRM I		FIRM II		FIRM III	
	Using Bulk Tallow		Using Drum Tallow		Using Drum Palm Prod	
	Financial Values(US\$)	Economic Values(US\$)	Financial Values(US\$)	Economic Values(US\$)	Financial Values(US\$)	Economic Values(US\$)
E. Raw Materials:						
Tallow	113.6	161.4	160.6	228.1	0.0	0.0
Palm Fatty	24.8	35.2	0.0	0.0	69.8	99.1
Palm Stearin	7.1	10.1	0.0	0.0	95.8	136.1
Coconut Oil	0.0	0.0	13.0	18.4	0.0	0.0
Caustic Acid	39.1	55.5	21.7	30.8	24.9	35.3
Silicate	4.2	5.0	4.6	5.6	12.6	15.2
CMC	0.0	0.0	0.0	0.0	0.0	0.0
Color	0.7	1.0	0.7	1.0	1.4	2.0
Pack. Material	11.0	13.3	13.5	16.3	16.8	20.3
Other (Specify)	0.0	0.0	0.9	0.0	0.0	0.0
Total Raw Mat. Cost	200.6	281.6	215.1	300.3	221.3	308.0
	72.6%	79.3%	71.7%	89.5%	83.1%	91.8%
F. Land:						
Soap factory	0.2	0.3	0.0	0.0	0.0	0.0
	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
G. General & Sell Exp:						
Advertisement	0.5	0.5	1.0	1.0	0.0	0.0
Insurance	0.5	0.0	14.1	0.0	0.0	0.0
Other (specify)	3.2	3.2	0.0	0.0	0.0	0.0
Total G & A Cost	4.2	3.7	15.1	1.0	0.0	0.0
	1.5%	1.0%	5.0%	0.3%	0.0%	0.0%
H. Duties and Taxes:						
Taxes on Raw Materi*	20.3	0.0	21.5	0.0	21.0	0.0
Total Taxes	20.3	0.0	21.5	0.0	21.0	0.0
	7.4%	0.0%	7.2%	0.0%	7.9%	0.0%

- * Taxes on raw materials are included in the total financial cost.
Tax on soap is not included in the financial price (ex-factory price).
It is also not included in the total cost.

TABLE 4.4 (cont'd)

**COST OF PRODUCTION AND PRICE OF
BAR SOAP OF UGANDA**

FIRM I		FIRM II		FIRM III	
Using Bulk Tallow		Using Drum Tallow		Using Drum Palm Prod	
Financial Values(US\$)	Economic Values(US\$)	Financial Values(US\$)	Economic Values(US\$)	Financial Values(US\$)	Economic Values(US\$)

I. Financing Cost:

Long Term Borrow:	0.0	0.0	0.0	0.0	0.0	0.0
Short Term Borrow:	5.0	0.0	26.1	0.0	4.9	0.0
Total Financing Cost	5.0	0.0	26.1	0.0	4.9	0.0
	1.8%	0.0%	8.7%	0.0%	1.8%	0.0%
Total Cost *	276.1	355.2	300.0	335.5	266.2	335.6
Net Profit	25.9	39.0	-5.5	58.4	37.8	58.3

J. Capacity Utilization:

Installed Cap	2,150,000	2,150,000	122,500	122,500	300,000	300,000
Days in Year Oper	319	319	319	319	300	319
Nos of Shifts	3	3	2	2	3	3
Hours in Shift	8	8	8	8	8	8
Avg Cost at Full Capacity	271	346	293	321	262	329

- * Taxes on raw materials are included in the total financial cost.
Tax on soap is not included in the cost

The ex-factory price of soap (i.e., the wholesale price at the factory) ranged from US\$ 295 to US\$ 304 per bar. This compares with US\$ 394 for a bar of comparable quality imported from Kenya.

Financially, both Firm I and Firm III appear sound. In the absence of reliable information on average rates of return for the industry or similar industries, we have analyzed the computed financial ratios on a normative basis wherever possible. The financial ratios estimated for the three firms surveyed are shown in Table 4.5. The operating ratio measures the proportion of operating expenses to total revenue and reflects the effectiveness of pricing of products and of production efficiency. The operating ratio varies between 82 and 88 percent for the three firms. Generally, this would appear high, but in Uganda, the Government monitors the price of soap and keeps it low. The producers are able to sell any amount they produce at this price. Therefore, even though the operating ratio may seem high, the producers ought to reach their target income by producing more. Moreover, a bank overdraft facility and Firm I's and Firm III's involvement with other businesses from the same establishment provide them with greater flexibility with respect to operating expenses. The return on sales—the ratio of net income to total revenue—is 8 percent for Firm I and 12 percent for Firm III. These would be considered moderately high rates for most industries in any country. The Bank of Uganda uses a lower figure (approximately 4 percent) in its pricing formula for the dominant soap producer, Firm I. We can thus assume that anything above that number is reasonable.⁷ Based on the same reasoning, the equity ratios—measuring proportion of net income to equity—of 15 percent for Firm I and 63 percent for Firm III are considered moderate. Firm II shows no profit, and thus has negative returns on sales and equity.

Obviously, Firm II's financial situation is not very sound. Having borrowed heavily at high interest rates, it is having great difficulty covering its costs. Also, because Firm II financed its investment primarily with borrowed funds, it pays a comparatively high insurance premium. Insurance and financing comprise almost 14 percent of total financial costs, compared to around 2 percent for its competitors. If adjustments were made for inflation in its interest calculations, Firm II could show a profit. For example, Uganda anticipates that inflation will reach 33 percent for 1991 and Firm II is expected to pay its interest charges from future earnings on soap sales at a 33 percent higher price. Firm II could also generate a profit if it could operate its plant at full capacity, rather than the current 66 percent capacity.

Despite rising inflation, these Ugandan soap producers have managed to keep costs down, in large part through higher capacity utilization. Producers reported that they could sell even more soap at the prevailing price than they are doing at present. Lack of raw materials and capital constrains them from producing more.

⁷ The Bank's use of 4 percent is conservative. The higher the percentage return on sales, the more firms will have to invest in expanded capacity or improved technology.

TABLE 4.5

**COMPETITIVENESS AND COMPARATIVE ADVANTAGE
OF BAR SOAP IN UGANDA**

	FIRM I		FIRM II		FIRM III	
	Using Bulk Tallow		Using Drum Tallow		Using Drum Palm Prod	
	Financial Values(US\$)	Economic Values(US\$)	Financial Values(US\$)	Economic Values(US\$)	Financial Values(US\$)	Economic Values(US\$)
Revenue	302	394	295	394	304	394
Cost of Tradables	227	291	237	300	244	311
Domestic Res. Cost	49	64	63	35	23	25
Profit	26	39	(6)	59	37	58
Financial Ratios:						
Operating Ratio	0.85	0.90	0.88	0.85	0.82	0.85
Return on Sale	0.08	0.10	-0.02	0.15	0.12	0.15
Return on Equity	0.15	0.16	-0.05	0.38	0.63	0.73
Economic Indicators:						
Profitability Coef.	0.71		-0.09		0.65	
Subsidy Rate Producers	-0.03		-0.16		-0.05	
Nom. Prot. Coef.:						
a. Outputs	0.77		0.75		0.77	
b. Inputs	0.78		0.79		0.78	
Effect. Prot. Coef.	0.73		0.62		0.72	
Private Cost Ratio	0.67		1.10		0.36	
Dom. Res. Cost Ratio	0.65		0.38		0.29	

4.3 International Competitiveness

The lack of published information on international trade in bar soap makes comparisons with production systems in other countries difficult. Before Uganda became self-sufficient in bar soap production, the bulk of the imported bar soap came from Kenya. A quotation therefore was obtained from a Kenyan dealer for the price of a comparable bar soap (Key brand soap) produced in Kenya, to represent the opportunity price of bar soap in our analysis. Arguments in favor of using the import parity price of Key brand soap from Kenya as the reference price for the international price of bar soap include (i) similarity in quality of the products, (ii) the proximity of the two markets, (iii) the high cost of international transportation and handling of soap products imported into Uganda, and (iv) the fact that the Kenyan soap market dominated the soap market in Uganda, prior to Uganda's self-sufficiency in soap production, which suggests that Kenya had some competitive advantage over other countries.

The import parity price⁸ of Key brand soap is computed in Table 4.1. Discounting the middleman margin that may have been included in the FOB price of US \$554 per ton, the cost of Kenyan soap in Nairobi is lower, but when the cost of transporting it to Kampala is taken into account (US \$554 + \$77 = \$631), it is more expensive than Ugandan soap in Kampala. Similarly, even though the price of soap produced in Nairobi may be higher than that of soap produced in Kampala, export parity price⁹ calculations show that Ugandan producers cannot compete in Nairobi (US \$509 per ton in Kampala + \$77 for transportation costs to Nairobi = a cost of \$586 for Ugandan soap in Nairobi). At the border, some trade may take place in either direction due to minimal transportation costs. Assuming free transfer of goods across the border with no tariff and similar unit transport cost in both countries, the direction of trade would favor Uganda in areas equidistant from Kampala and Nairobi.

Several producers suggested that small quantities of soap are being traded across the border to neighboring Zaire, Sudan, and even Tanzania, although these statements could not be confirmed. Markets in Kampala and Jinja were searched for evidence of foreign soap sales. While several brands of toilet soap were spotted, no imported bar soap was found.

4.4 Economic Analysis

4.4.1 Social Profitability

Financial prices collected from the soap manufacturers were adjusted to account for distortions in foreign exchange and factor markets, and transfer payments were removed to estimate the economic (also called social) profitability of each firm. Table 4.6 describes the reason for and the magnitude and direction of the adjustments made to the financial prices in order to derive economic values.

⁸ The import parity price is the wholesale price of an imported commodity where it is being consumed. Technically, it is equal to the CIF price plus clearing costs plus inland transportation costs to the primary distribution center.

⁹ The export parity price of Ugandan soap in Kenya is calculated by adding the cost of transportation to Nairobi to the Kampala ex-factory price.

Table 4.6

Adjustments of Financial Costs and their Effects

COST ITEM	REASON FOR ADJUSTMENT	MAGNITUDE	EFFECT ON FINANCIAL COST
Materials Imported through OGL/SIP	Overvalued Exc. Rate	42 percent	Positive
Cost of Capital	Controlled	66 Percent	Positive
Social Security	Transfer Pay	Varied	Negative
Unskilled Labor	Large Unemployment	10 percent	Negative
Electrical Power	Govt. Subsidy	67 percent	Positive
Petroleum Product	Govt. Duty	20 percent	Negative
Insurance	Transfer Payment	100 percent	Negative
Import Tax	Transfer Payment	100 percent	Negative
Sales Tax	Transfer Payment	100 percent	Negative
Bank Interest	Transfer Payment	100 percent	Negative

Table 4.4 presented the enterprise budgets with the calculation of net social returns to management for each of the three firms. Social profitability rankings provide a preliminary indication of comparative advantage. Social prices reflect the true economic scarcity value of inputs and outputs, so the enterprise with the largest positive net social returns represents the most profitable production alternative in terms of its contribution to national income. Furthermore, because social prices for primary factors are equal to their alternative use values, the social profitability rankings automatically indicate relative efficiency in production and thus provide an accurate measure of comparative advantage.

Although the cost of soap to the economy is almost 28 percent higher than the cost in financial terms, the production of soap provides a significant net social profit across all producers (the reasons for this are explored further in section 4.4.3). Net social profitability is highest for Firm II and Firm III at USh 58 in profit per bar of soap sold. Firm I's net social returns are somewhat lower at USh 39 per bar. Higher social returns to management for Firm II and Firm III are the result of more efficient use of capital and fuel oil. Both Firm II and Firm III use fewer of the scarce capital and intermediate inputs, compared to relatively abundant labor, to produce a unit of soap than Firm I does.

4.4.2 Efficiency of Soap Production

Does soap production represent an efficient use of the nation's resources? A positive domestic resource cost ratio between 0 and 1 indicates that the value of the domestic resources used in production is less than the value of foreign exchange saved; thus, Uganda has a comparative advantage in soap if the DRC ratio is between 0 and 1.

DRC ratios for each firm are found in Table 4.5. The value of domestic resources used in soap production was found to be significantly less than the incremental value of foreign exchange that would have been spent had soap been imported rather than produced domestically (i.e., the DRC ratio was less than 1 for all three firms). This implies soap production is an efficient use of Uganda's resources. Among the three producers, Firm III uses the least amount of domestic resources for a unit of value added (DRC=0.29), followed by Firm II (DRC=0.38), and Firm I (DRC=0.65).

4.4.3 Policy Impacts

The PAM uses the concept of financial versus economic prices to explore distortions caused by policies. As mentioned earlier, financial prices represent what the firms actually pay, while economic prices reflect the cost to the economy. For example, the financial output price of soap in the analysis is the ex-factory price received by the firm for each bar of soap it sells, whereas the economic price was found by taking the price of a similar bar of soap produced in Kenya and adding the economic cost of handling and transporting it from Nairobi to Kampala.¹⁰

As depicted in Table 4.5, the financial prices that people pay differ considerably from the opportunity costs that the economy bears in the soap subsector of Uganda. This section explores in more detail the reasons for these divergences.

Tables 4.7, 4.8, and 4.9 present the PAMs for each of the three firms. The private cost ratio measures the degree of comparative advantage given the current policy distortions. The DRC ratio, since it is measured in economic prices, shows whether the enterprise would have a comparative advantage if all policy distortions were eliminated. Nominal and effective protection coefficients (NPCs and EPCs) are calculated to show whether policies are subsidizing or taxing producers. Nominal protection coefficients are shown separately for outputs and inputs and demonstrate the impact of policies on the output price charged and the price paid for inputs.

¹⁰ In DRC analysis the reference price used is typically a world price of a good evaluated at the nearest port (e.g. for wheat, the c.i.f. price of wheat delivered at Mombasa would be used). However, since international trade in the type of bar soap produced in Uganda does not exist, the best comparison was with the price of a similar soap in Kenya. Unfortunately, it was beyond the scope of the study to examine other possible supply sources.

TABLE 4.7

**POLICY ANALYSIS MATRIX RESULTS:
PLANTS USING BULK TALLOW**

Types of Measures	REVENUE	COSTS				Total Costs	Profit
	Tradable	Tradable Input Cost	Labor Cost	Capital Cost	Other Dom Costs		
Financial	302	227	12	31	7	276	26
Economic	394	291	11	47	9	358	36
Policy Effects/ Divergences	(92)	(65)	1	(15)	(1)	(82)	(10)

Financial Value Added	75
Economic Value Added	103
Profitability Coefficient	0.71
Subsidy Rate to Producers	-0.03
Nominal Protection Coefficients:	
a. Outputs	0.77
b. Inputs	0.78
Effective Protection Coefficient	0.73
Private Cost Ratio	0.67
Domestic Resource Cost Ratio	0.65

Figures are added or subtracted to the nearest whole number.

TABLE 4.8

**POLICY ANALYSIS MATRIX RESULTS:
PLANTS USING DRUMMED TALLOW**

Types of Measures	REVENUE	COSTS				Total Costs	Profit
	Tradable	Tradable Input Cost	Labor Cost	Capital Cost	Other Dom Costs		
Financial	295	237	10	37	16	300	(6)
Economic	394	300	10	24	2	335	58
Policy Effects/ Divergences	(99)	(64)	0	14	14	(35)	(64)

Financial Value Added	58
Economic Value Added	94
Profitability Coefficient	-0.09
Subsidy Rate to Producers	-0.16
Nominal Protection Coefficients:	
a. Outputs	0.75
b. Inputs	0.79
Effective Protection Coefficient	0.62
Private Cost Ratio	1.10
Domestic Resource Cost Ratio	0.38

Figures are added or subtracted to the nearest whole number.

TABLE 4.9

**POLICY ANALYSIS MATRIX RESULTS:
PLANTS USING PALM PRODUCTS**

Types of Measures	REVENUE	COSTS				Total Costs	Profit
	Tradable	Tradable Input Cost	Labor Cost	Capital Cost	Other Dom Costs		
Financial	304	244	6	14	2	266	38
Economic	394	311	5	16	3	336	58
Policy Effects/ Divergences	(90)	(67)	0	(2)	(1)	(69)	(21)

Financial Value Added	60
Economic Value Added	83
Profitability Coefficient	0.65
Subsidy Rate to Producers	-0.05
Nominal Protection Coefficients:	
a. Outputs	0.77
b. Inputs	0.78
Effective Protection Coefficient	0.72
Private Cost Ratio	0.36
Domestic Resource Cost Ratio	0.29

Figures are added or subtracted to the nearest whole number.

An NPC for outputs < 1 (e.g., Firm I's NPC=0.78) implies the firm is receiving a price lower than the world price, which is an implicit tax. Conversely, an NPC < 1 for inputs implies they are paying a price lower than the world price and thus are in effect being subsidized. The effective protection coefficient accounts for the level of distortion on both output and input prices, and an EPC < 1 indicates an overall policy effect that taxes Ugandan manufacturers relative to soap producers elsewhere (in this case, Kenya).

Financial revenues are lower than economic revenues for a firm when output is taxed. In this particular case, each Ugandan manufacturer must pay a 5 percent sales tax. On the input side, subsidies reduce financial prices below the true economic value of the input. As shown in Tables 4.7, 4.8 and 4.9, Ugandan firms are subsidized on the input side due to their ability to import raw materials at the official rather than the more costly market rate of exchange. However, the effective protection rate (which accounts for protection levels for both inputs and outputs) for the industry is less than one, implying that the overall effect of government policy in Uganda is a tax on soap production. This effect is also reflected in a negative subsidy rate for each of the three firms. For example, a subsidy rate of -0.03 for Firm I implies that the firm's revenues were decreased by 3 percent due to government intervention.

In the domestic factor market, the soap industry (possibly like all other industries) enjoys fairly high implicit subsidies. The cost of capital is subsidized due to government policies which set interest rates at levels below the opportunity cost of capital. Also, fixed capital inputs are subsidized since they are purchased at the official (overvalued) exchange rate. The financial cost of labor was slightly higher than the economic cost due to a minimum wage law for the industrial sector. If there were no distortion in the labor market, producers would have established lower wage rates for unskilled labor. If this implicit tax on producers (and subsidy to labor) had been accounted for, the overall effect may have been somewhat smaller. The cost of energy is highly subsidized as well. The Uganda Electricity Board (UEB), which produces and distributes all electrical power in Uganda, recovers only 60 percent of its costs at the current price charged. The opportunity cost of energy may also be higher than the one used in this analysis (the cost of producing energy by the UEB) if a realistic trade price could be established.¹¹ The cost of energy in neighboring countries to which Uganda exports electricity is much higher, but due to long-term export agreements Uganda does not charge a world equivalent price and is in fact subsidizing consumers in Kenya.

Comparison of private and social profitability thus reveals that government policies provide disincentives to Ugandan soap manufacturers, since private profitability is less than social profitability for all three firms. In other words, government policies are taxing away a portion of the social profits. This tax affects Firm II the most (i.e., the size of the divergence between social and economic profits is the greatest), and Firm I the least.

¹¹ Shortly after the completion of this study, electricity rates were increased substantially, thus eliminating this subsidy.

4.5 Sensitivity Analysis

Changes in the value of some of the assumptions made to estimate economic parameters are simulated in this section, and the impact on economic and financial indicators of comparative advantage is explored. The following potential changes were analyzed:

- The international price of soap drops by 10 percent.
- Firm I switches to drummed tallow.
- Firm I uses only palm oil products.
- Firm II invests \$20,000 in a bulk loading facility.

Case 1: Table 4.10 summarizes Firm I's economic and financial condition assuming the world reference price for soap used in the analysis is 10 percent lower. This would have no impact on Firm I's financial condition. Firm I would continue to produce and make a profit because of the positive effective protection provided by policies (i.e., $EPC > 1$). However, the country would incur a net loss (negative social profitability). Uganda would lose its comparative advantage in producing soap (the DRC ratio is greater than one). The country would save foreign exchange by importing soap rather than producing it. This indicates that although the current DRC ratios are below one (i.e., comparative advantage exists), there is not a large margin of error for Ugandan firms in terms of international competitiveness. If Kenyan production efficiency were to improve, or transport costs from Kenya to Uganda were to fall, causing the import parity price of Kenyan soap to decrease by 10 percent, Ugandan firms would not remain competitive.

Case 2: Table 4.11 presents Firm I's economic and financial situation if it were to use drummed tallow rather than bulk tallow. The company would suffer financially because it would have to pay 22 percent more for tallow. It would incur losses unless it reorganized its production system (possibly by selling its bulk handling facilities). Its DRC ratio increases from 0.65 to 1.07, indicating a high cost in efficiency to the economy of using the higher cost input technology (i.e., drummed instead of bulk tallow). The assumptions in this scenario were tested not to explore whether Firm I should consider using drummed tallow, but to reinforce the hypothesis that using bulk tallow is a more feasible option for both large and small producers. Case 2 demonstrates the feasibility of a large producer using bulk tallow, and Case 4 will explore the feasibility of small producers using it.

Case 3: Table 4.12 shows the economic and financial situation of Firm I if it switched to using palm products as the main fatty substance input to soap. If it stopped using bulk tallow, it would be more profitable to use drummed palm product rather than drummed tallow in order for the firm to remain financially viable and for the economy to maintain a strong comparative advantage. However, private profits are negative for the case of drummed palm versus bulk tallow. The social profit using drummed palm oil is positive, suggesting the economy would benefit from this conversion. This scenario raises the issue of whether palm products are in fact just as viable (or more viable) an input into soap manufacturing as tallow is. This, of course, will vary depending on world market conditions and the price of imported palm products versus

tallow. The average price of palm stearin was considerably lower than the prices of tallow and palm fatty which were about equal to each other (see Table 4.1). It is therefore quite obvious that if bulk palm products were available at the international CIF price, Firm I could have enjoyed more financial and social profit by using bulk palm products over bulk tallow. However, at the time of the study, it was reported that due to various market barriers in Kenya, palm products could not be imported into Uganda through Mombasa. This highlights the importance of these soap manufacturers being aware of and carefully monitoring world prices for alternative imported inputs, especially as they represent such a high percentage of total costs.

Case 4: Table 4.13 summarizes the financial and economic condition of Firm II if it were to invest US\$ 11.02 million (\$20,000)¹² in a loading facility to handle bulk tallow. The yearly depreciated value of the incremental investment is reflected in an increase in capital cost. A lower price of bulk tallow would result in a decrease in raw material costs, assuming that the volume of all materials used remains constant. Firm II's financial condition would improve significantly, showing a positive financial profit (an improvement from Ush -6 to Ush 20 per bar of soap). A comparative advantage would be strengthened, with the DRC ratio decreasing from 0.38 to 0.28. This case demonstrates the advantage of using the technology for bulk tallow rather than drummed tallow. The cost difference between the bulk and drummed tallow is large enough to cover the incremental cost of capital improvements for bulk handling capacity.

¹² It was not possible to rigorously determine the cost of building a bulk handling facility for Firm II. The estimate of \$US 20,000 represents around 10 percent of Firm II fixed assets.

TABLE 4.10

**POLICY ANALYSIS MATRIX
PLANTS USING BULK TALLOW**

Sensitivity Analysis: Case 1: Ten percent reduction in price of imported soap.

Types of Measures	REVENUE	COSTS				Total Costs	Profit
	Tradable	Tradable Input Cost	Labor Cost	Capital Cost	Other Dom Costs		
Financial	302	227	12	31	6	276	26
Economic	354	291	11	47	6	355	(1)
Policy Effects/ Divergences	(53)	(65)	1	(15)	(0)	(79)	26

Financial Value Added	75
Economic Value Added	63
Profitability Coefficient	-43.67
Subsidy Rate to Producers	0.07
Nominal Protection Coefficients:	
a. Outputs	0.85
b. Inputs	0.78
Effective Protection Coefficient	1.19
Private Cost Ratio	0.68
Domestic Resource Cost Ratio	1.01

TABLE 4.11

**POLICY ANALYSIS MATRIX
PLANTS USING BULK TALLOW**

Sensitivity Analysis: Case 2: Drummed tallow replaces bulk tallow

Types of Measures	REVENUE	COSTS				Total Costs	Profit
	Tradable	Tradable Input Cost	Labor Cost	Capital Cost	Other Dom Costs		
Financial	302	260	12	31	6	309	(3)
Economic	394	334	11	47	6	398	(4)
Policy Effects/ Divergences	(92)	(74)	1	(15)	(0)	(88)	(4)

Financial Value Added	42
Economic Value Added	60
Profitability Coefficient	1.90
Subsidy Rate to Producers	-0.01
Nominal Protection Coefficients:	
a. Outputs	0.77
b. Inputs	0.78
Effective Protection Coefficient	0.70
Private Cost Ratio	1.18
Domestic Resource Cost Ratio	1.07

TABLE 4.12

**POLICY ANALYSIS MATRIX
PLANTS USING BULK TALLOW**

Sensitivity Analysis: Case 3: Drummed palm oil/steann replaces bulk tallow.

Types of Measures	REVENUE	COSTS				Total Costs	Profit
	Tradable	Tradable Input Cost	Labor Cost	Capital Cost	Other Dom Costs		
Financial	302	254	12	31	6	304	(2)
Economic	394	327	11	47	6	390	3
Policy Effects/ Divergences	(92)	(72)	1	(15)	(0)	(87)	(5)

Financial Value Added	48
Economic Value Added	67
Profitability Coefficient	-0.52
Subsidy Rate to Producers	-0.01
Nominal Protection Coefficients:	
a. Outputs	0.77
b. Inputs	0.78
Effective Protection Coefficient	0.71
Private Cost Ratio	1.04
Domestic Resource Cost Ratio	0.95

TABLE 4.13

**POLICY ANALYSIS MATRIX
PLANTS USING DRUMMED TALLOW**

Sensitivity Analysis: Case 4: Invest \$20,000 in borrowed fund for bulk handling facility and use bulk tallow

Types of Measures	REVENUE	COSTS					Total Costs	Profit
	Tradable	Tradable Input Cost	Labor Cost	Capital Cost	Other Dom Costs			
Financial	295	205	10	43	16	274	20	
Economic	394	260	10	26	2	298	96	
Policy Effects/ Divergences	(99)	(55)	0	17	14	(24)	(76)	

Financial Value Added	89
Economic Value Added	134
Profitability Coefficient	0.21
Subsidy Rate to Producers	-0.19
Nominal Protection Coefficients:	
a. Outputs	0.75
b. Inputs	0.79
Effective Protection Coefficient	0.67
Private Cost Ratio	0.77
Domestic Resource Cost Ratio	0.28

5. CONCLUSION AND RECOMMENDATIONS

Bar soap is a particularly important item in the market basket of items consumed by low- and middle-income households in Uganda. It is also one of the country's better developed industries, employing a major share of the labor force in the manufacturing sector. There has been rapid development in the soap subsector over the last four years. Today, Uganda's private sector produces almost all soap consumed in the country.

The Government retains some control over the industry, however. On the output side, it administers the ex-factory price of soap at Firm I, the dominant producer, while on the input side, it provides producers with cheap foreign exchange (at the official rate) to import raw materials and machinery. Even though an import duty and a sales tax are imposed on raw materials, the producer still enjoys a net positive nominal protection for inputs. When the impact of policies on both inputs and output are considered, however, the soap industry does not enjoy positive, effective protection.

Over the last four years, Firm I has emerged as the dominant force in the soap industry, currently producing almost 90 percent of Uganda's commercially produced soap. Firm I is the only company that uses bulk tallow, importing it for 20 percent less than the cost of the drummed tallow used by most other soap producers. The smaller producers compensate for this difference in raw material expenses by cutting capital and administrative costs.

This study concludes that soap production is viable in Uganda both financially and economically. Financially, producers are able to produce and sell at the current market price, which is lower than the price of a comparable Kenyan soap, and still show moderate profits. The social profitability, which indicates the economic rate of return after all expenses have been paid according to their opportunity costs, is even higher than the financial profitability. Social profitability and the comparative advantage of soap have been estimated using the Domestic Resource Cost (DRC) methodology. The DRC ratios for all the firms studied reveal significant comparative advantage.

In addition, the sensitivity analysis completed for this study reveals that the comparative advantage of Ugandan soap is extremely sensitive to the international parity price of soap. A 10 percent drop in the international price would wipe out almost all of Firm I's comparative advantage under its current production techniques. Other producers might continue to enjoy comparative advantage, especially if they switched to the use of bulk tallow. Drummed palm fatty and palm stearin do not provide a significant cost advantage over bulk tallow. However, if they could be obtained at the bulk rate, and if consumers purchased soap made from palm products at the same rate as they currently purchase soap made from tallow, returns to producers would improve.

A key recommendation of this study is that producers should be encouraged to switch to bulk tallow. Detailed financial analysis needs to be performed at the firm level for prospective investors, however. Imported raw materials comprise a large portion (73 percent) of the cost of making soap. It would be possible to significantly reduce that cost (in foreign exchange) by importing tallow in bulk rather than in drums. Soap production would not be financially viable for Firm I if the company were using drummed tallow instead of bulk tallow. Our findings also suggest that if Firm II, which currently shows no profit, invested about 10 percent more capital in equipment and storage facilities that would enable it to use bulk tallow, its financial condition would improve.

It appears that conversion to the use of bulk tallow is a physically viable option for many plants that are currently using or preparing to use drummed tallow or palm fat. Lack of technical know-how and financial access, however, have kept them from implementing this option. Therefore, technical assistance to construct bulk storage and handling facilities and financial assistance should be provided to viable firms. The results would be greater competition and more efficient production of soap in Uganda.

Finally, market competition should be fostered in Uganda's soap industry. Market competition, rather than the Government, should set the ex-factory price of soap. In fact, the study indicates that the smaller firms may be more efficient producers than Firm I because they use fewer resources in producing a unit of soap than their larger counterpart does. Our study shows that the large firm (Firm I), which has a major share of the soap market in Uganda, does not have a significant cost advantage over other producers. Its advantage possibly lies largely in its access to capital. Therefore, if all firms had equal access to resources and raw materials, and the playing field were leveled, the soap industry would be more competitive and dominance of any individual firm would be reduced.

One means to generate competition in the industry would be for future PL 480 Title III programs to give all soap producers equal access to PL 480 tallow. The PL 480 Title I program has ensured a steady supply of tallow to Firm I for the last three years. A few other firms have been able to obtain some PL 480 tallow, but they have not been assured of a steady supply.

At the time of the first PL 480 Title I tallow program in 1988, no other firm was willing and able to import significant amounts of tallow; Firm I was thus an obvious choice as the implementing agent. With bold initiatives, the firm invested in special handling and transport equipment to take advantage of the program, emerging as the dominant producer. The numerous other firms that have shown interest in the new tallow program should be allowed to participate, possibly with the stipulation that they demonstrate their ability to handle and use bulk tallow.

Another key recommendation is the termination of administrative control over the price of soap. The Government sets the price of soap based on cost information that Firm I provides to the Bank of Uganda. The producer therefore has very little incentive to reduce costs. The mechanism works like a price leadership system under oligopoly.

Our study has illustrated that Firm I enjoys no significant cost advantage over its competition. Thus, if a supply of raw materials is ensured for other producers, many firms, including Madhvani and Mbale, will be able to improve capacity utilization. It is anticipated that competition among the producers will keep prices at a reasonable level, even when government administrative control ceases. Currently, the Government sets prices for Firm I, but it was observed that the ex-factory price for all producers has stayed below that level. In July 1991 the price of soap was set at USh 384, whereas it actually sold for between USh 350 and USh 375.

In addition, the use of bulk palm product, which is considerably cheaper in the international market than bulk tallow, should be explored. The PL 480 tallow program is likely to continue for a few more years. Rather than becoming too dependent on it, however, the industry should think about alternatives to tallow, such as palm fatty and palm stearin. The drummed palm products that some producers use are more expensive than bulk tallow. Use of drummed palm products is therefore not an appropriate substitute for bulk tallow. The administrative, financial, and physical feasibility of importing bulk palm fatty and palm stearin as alternatives to bulk tallow has not been sufficiently studied.

This study has demonstrated that Uganda has a comparative advantage in soap production, based on the current cost structure in the industry and using the price of a brand of Kenyan bar soap that most closely resembles the quality of soap produced in Uganda as an international reference price. However, two limitations must be considered in interpreting the results. The first is inherent in the DRC methodology. DRC is a static measure of comparative advantage at a given moment based on a given technology. The second weakness is our inability to explore fully the cost structure of soap in the countries from which comparable soap could be imported into Uganda. We were not fully aware of the cost structure in Kenya or Tanzania, for example. We do not know if the industries in Kenya and Tanzania are government-controlled and subsidized. This information would greatly help in validating the findings and reinforcing our interpretation. It would also provide valuable insight into policy decisions.

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