

Ethiopian Journal of Economics

Volume X

Number 2

October 2001

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Volume X

Number 2

October 2001

Ethiopian Journal of Economics

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A Publication of
THE ETHIOPIAN ECONOMIC ASSOCIATION
(EEA)

ETHIOPIAN JOURNAL OF ECONOMICS

VOLUME X NUMBER 2 October 2001

Published: April 2006

Micro and Small Enterprises (MSE) Development in Ethiopia: Strategy, Regulatory Changes and Remaining Constraints¹

Gebrehiwot Ageba and Wolday Amha²

Abstract

This paper gives some detailed information on the profile of the MSE operators/MSEs and examines the current business environment for the MSE sector. It is based on primary data collected by the authors through a survey of 974 MSE operators using a structured questionnaire. Although there have been attempts by the government to liberalize and improve the policy, regulatory and institutional support environment for MSEs, which resulted in increase in investment and competition and improvement in the licensing procedures, information from the survey data indicates that there is divergence between stated policies & directives and the outcome on the ground. Capital shortage, inadequate business premise, inadequate/uncertain market and high taxes still remain major constraints to expand MSEs. Moreover, the data revealed that policy predictability is quite low. Much more remains to be done to create an enabling business environment. Concrete and coordinated regulatory and institutional support (infrastructure facilities like business premises, water and power; financial services; extension services; assistance in the transfer of technologies; promotion of marketing facilities; and provision of training on sustainable basis) has yet to be provided by the government and other stakeholders.

¹ The final version of this article was submitted in March 2006.

² We are grateful to the EDRI for allowing us to use the data for this paper. We benefited from discussions with EDRI staff, comments by participants of the Micro and Small Enterprises Survey Report Workshop (January 17, 2004), and the International Conference on Microfinance Development in Ethiopia (January 21-23, 2004). We thank the anonymous referees whose comments led to important improvements. Any remaining errors or weakness are ours.

1. Introduction

In Ethiopia, according to the nationwide urban informal sector survey by the CSA (2003b), there were 799,358 establishments employing 997,380 persons (1.3 persons per establishment), of which 60 percent were female. About 43.3 percent were involved in manufacturing and about 37.8 per cent in trade, hotels & restaurants. The survey also revealed that about 74.7 per cent of the informal sector operators started their operation with initial capital of up to Birr 250. On the other hand, the survey of Small Scale Manufacturing Industries (CSA 2003c) indicated that it engages 97,782 persons, about 91 per cent of which were male. The 2002 nationwide survey of cottage/handicraft manufacturing establishments by the CSA (2002a) identified 974,676 establishments engaging 1,306,865 people (1.34 persons per establishment) compared to the 98,136 industrial workers employed in the Large and Medium Scale enterprises in 2002. Of these, 616,696 (63 per cent) were in urban areas while the remaining 357,979 (36.7 per cent) were located in rural areas. Among the persons engaged, 74 per cent were women; about 94 per cent were active owners, partners or family workers while 4.3 per cent were employees. In terms of start-up capital, more than 87 per cent of the cottage/handicraft manufacturing industries started their operation with a total capital of less than 250 Birr while 12 per cent had initial capital ranging from 251 to 5,000 Birr (CSA 2003a).

The employment figures indicated above contrast with only 98,136 industrial workers employed by large and medium scale enterprises during the same period.

The importance of the micro and small enterprises sector in Ethiopia, particularly for the low-income, poor and women groups, is evident from their relatively large presence, share in employment and small capital requirement. These are sufficient reason for governments and other stakeholders in development to be interested in micro and small enterprises. However, in the context of many developing countries, countries in transition in particular including Ethiopia, MSEs are also seen as an emerging private sector, forming the basis for private-sector-led growth. In Ethiopia, at the level of strategy and policy, these roles of MSEs have received recognition. They are seen as means of providing employment, alleviating poverty, ensuring food security, and private sector development. For example, see ADLI (MoFED 2003), the Poverty Reduction Strategy (MoFED 2002), the Industrial Development Strategy (Ministry of Information 2003, Amharic), the Micro and Small Enterprises Development Strategy (Ministry of Trade and Industry 1997), and the Food Security Strategy (FDRE, 2002). Reflecting this, numerous initiatives and interventions, by

government and donors alike, have been underway. Yet, the sector has not been studied adequately. While the CSA surveys referred to above provide useful information, comprehensive surveys such as these, covering both urban and rural areas, naturally face a limit as to the extent of details they could reasonably be expected to handle. Besides, they cover manufacturing industries only. So, detailed MSE related studies are very scarce to say the least. The result is that the available data is patchy in terms of detail, especially on issues of supplier finance (or trade credit), marketing, institutions & infrastructure, etc. and, in particular, impact of enacted policies and rules/regulations, issues of predictability of rules/regulations, and remaining policy/regulatory constraints. It was to partially fill this information gap that EDRI conducted a comprehensive survey of MSEs in six major towns during May-June 2003.

Sampling method

The official definition of micro and small enterprises (i.e. having 10 workers or less) was adopted, but excluded street vending and "gulits". The sampling method involved the following steps. First, six major cities in Ethiopia with high population density and MSE concentration, namely Addis Ababa, Nazret, Awassa, Baher Dar, Jimma and Mekele, were covered (the number of towns covered being dictated by resource availability). Secondly, the major micro and small enterprise activities were identified on the basis of information from previous surveys, reconnaissance survey conducted by the principal researchers, and a pilot survey (in which the coordinator, supervisors and some of the enumerators were also involved). Then, a sample of 1000 micro and small enterprises was selected which, in the absence of MSE list by town, was distributed non-proportionately across the six cities as follows: 250 from Addis and 150 from each of the other towns. The firms were then selected randomly. Data was obtained from 974 MSEs: 551 micro (with less than 5 workers) and 423 small (having 5-10 workers) enterprises, including 226 women-operated MSEs, in which 3,651 persons (excluding apprentices) are engaged.

Method of data collection

The would-be enumerators and supervisors were trained intensively on each question of the structured questionnaire prepared for the purpose, after which the best were selected. They were then involved in the pilot testing. The questionnaire was refined and finalized based on inputs from the pilot survey, which was then administered to the sample MSEs. Completed questionnaires were checked for errors and

inconsistencies at two levels: first, supervisors in each cite were made to thoroughly check every questionnaire immediately after completion and those with errors returned to the enumerators for correction. The second check involved a data analyst. Unlike previous MSE studies and surveys in Ethiopia (including the CSA surveys cited above), the present study included highly detailed questions related to various aspects of MSEs, thereby generating data that permits in-depth analysis of many MSE related issues so as to under-pin evidence-based policy making. The survey instrument (structured questionnaire) included questions related to background of the owner and history of the enterprise; finance; marketing; business development services (BDS); product improvement/change; rules/regulations; and infrastructure issues; as well as relationships with suppliers and clients.

The rest of this paper is organised as follows. A brief conceptual framework is given in section 2. Section 3 presents summary discussion on past and present MSE policy and strategy in Ethiopia. Section 4 gives profile of MSEs/operators in terms of personal characteristics (gender, age, education, prior business experience, etc.), ownership, legal status, acquisition & financing, reason for engaging in the business, etc. Section 5 looks at the impact of policy changes and the current 'business environment' as MSE operators perceive it: regulations/rules related constraints facing the sector as well as *perceived* predictability of laws & policies, government adherence to its policies and credibility of policies are discussed. Section 6 concludes.

2. Conceptual framework

Traditional approaches to MSE development relied on direct and subsidized provision of financial and non-financial services. The disappointing outcome necessitated a search for more effective ways. The new approach, takes individuals' "creativity, drive and commitment", rather than government actions, as the key in setting up, operating and developing businesses. It also recognises that the wider social, economic and institutional context, over which government has control affect the conditions that enable and/or constrain entrepreneurship. It emphasises three areas: business environment, financial services, and business development services (BDS). Some aspects of the required environment are common for all firms, small and large alike. These include: stable macro-economy, openness in trade and investment, competitive financial sector, developed physical (transport, warehousing, port facility,

communication) and social (education and health) infrastructure" (Hallberg 1999). Others aspects are specific to MSEs". These may include: entry barriers and non-competitive behaviour in MSE markets; expensive and cumbersome regulatory requirements (including registration, licensing and land/premise allocation procedures); levies; tax structures that are discriminatory and distort incentives; laws related to business protection and intellectual property (discouraging innovation); government procurement procedures that discourage MSE participation; and rigidities in the labor market that not only make hiring & firing difficult & costly but also limit labor flexibility and mobility (ibid).

The approach gives emphasis to the creation of an enabling environment for MSE competitiveness and developing markets for MSE-relevant services (rather than substitute them). There is a move away from subsidy and public provision of services, instead directing government action toward completing markets to correct their failures and eliminating policy biases. In order to widen the coverage and impact of government programs, it (i) uses the private sector to deliver services, and (ii) focuses allocation of public resources on "facilitating market transactions and investing in public goods...that open market access and build enterprise competitiveness" (e.g. infrastructure, education, technology) (Hallberg, 1999).

3. MSE policy and strategy in Ethiopia

Designing and implementing appropriate economic policies, strategies, and legal and regulatory framework are *prerequisites* for creating an enabling environment to promote MSEs. In Ethiopia it could be argued that deliberate effort to promote MSEs is relatively recent. In line with its ideology, policies and regulations of the Derg regime aimed at curtailing (if not eliminating) the private sector. Restrictive policies such as fixing a ceiling on industrial capital, introducing one man–one license rule, favouring state/parastatal organizations in availing foreign exchange and bank loans, limits on single borrower loans³, restrictions on license and investments, absolute priority given to the public sector in access to trained qualified manpower, etc. were in place. In general, the legal requirements to obtain licenses during the Derg were bureaucratic which discouraged the participation of micro and small enterprise operators. The tight foreign exchange control and heavy import restrictions (both

³ These were set at maximum of birr 500,00 in case of AIDB (now DBE), and birr 1 million in case of CBE.

inputs and other commodities) had created scarcity of imported commodities and corrupt and rent seeking business community (see Gebrehiwot 1997 for more discussion on this).

Following the regime change in 1992, drastic measures, intended to transform the command economy to a market-led one, many of which are bound to affect MSEs, were taken. The main macro economic reforms and restructuring that, directly or indirectly, affect the development of MSEs include: adoption of market economic policy; deregulation of domestic prices; devaluation of the local currency; privatisation of public enterprises; decentralization and devolution of power and the formation of regional states; formulation of a new labour law; financial sector reforms including the opening of private banks, insurance companies and microfinance institutions. The reforms also included the monetary management and liberalization of interest rates and foreign exchange market; fiscal policy reform including tax reform, budgetary restructuring and reduction of government deficits; introduction of investment laws to encourage private (both domestic and foreign) investment; liberalization and promotion of foreign trade; and promotion of favourable economic environment and bilateral, regional and multilateral international relations. There are also MSE-focussed measures including the issuance of the National Micro and Small Enterprises Strategy (1997⁴) and establishment of the Federal Micro and Small Enterprises Development Agency.

The strategy stresses that “various policy, structural and institutional related problems and bottlenecks” have constrained the role of the MSE sector in and contribution to the national economy. It thus primarily aims at creating enabling legal, institutional and other supportive environments for the development of MSEs. The specific objectives of the strategy include: facilitating economic growth and bring about equitable development; creating long-term jobs; strengthening cooperation between MSEs; providing the basis for medium and large scale enterprises; promoting exports; and balancing preferential treatment between MSE and bigger enterprises. The intended MSE support include creating legal framework; improving access to finance; introducing different incentive schemes; encouraging partnerships; providing training in entrepreneurship, skills, and management; improving access to appropriate technology, information, advice and markets; and developing infrastructure. The strategy also states its intention to strengthen private sector

⁴ Based on the national strategy, regional governments have developed their own regional MSE development strategies.

associations and chambers. A number of institutions are expected to be involved in providing support to the MSEs⁵.

The strategy is based on the new approach to MSE development. As stated in the strategy, the fundamental principles guiding interventions by stakeholders (government, private sector, NGOs, Associations, Chambers and others) include: that support to the MSE operators will be based on private sector development; that all support to the MSE sector should be designed to be all-round; that support services should, as much as possible, be based on fees; that addressing marketing problems of MSE operators will be given due consideration; that emphasis will be given to the advancement of women; that supporting institutions should provide solid services to the MSE operators using adequately skilled and trained staff; that the private sector will be involved in the supply of commercial BDS to MSE operators; and that cooperative ventures should be facilitated.

The industrial development strategy, issued in 2003⁶, recognises the promotion of MSEs as an important instrument to create productive private sector and entrepreneurship, hence accords it due emphasis and priority. It promises to make every effort to support this sector through provision of infrastructure (working premises and land), financial facilities, supply of raw materials, training, etc. Federal and regional governments are expected to coordinate the support services.

Taken at face value, it would appear that these measures would go a long way in promoting MSEs in the country. However, a study by the ECA (2001) concluded that countries such as Cameroon, Ethiopia, Gabon, Nigeria, Senegal and Uganda have shown that the policy environment in which MSEs operate proves to be a major handicap for their expansion and growth. The same study reveals that the complexity of the customs system and the many forms and declarations required have had a negative impact on the general business climate, diverting entrepreneurs' efforts from more productive tasks. The tax levied on imported *raw materials* is often higher than that on imported *finished products* that use the same raw materials. The result is a substantial increase in the production cost of MSE operators that require highly taxed

⁵ These include government and other public sector agencies at both national and local levels (such as various ministries, Federal and regional MSE agencies, banks, etc), NGOs, donors, and private business associations.

⁶ Currently, there are attempts to revise the current National Micro and Small Enterprises Strategy of Ethiopia issued in 1997.

imported inputs, thereby limiting their competitiveness. In Ethiopia, the infrastructure was also evaluated as particularly disabling.

As argued in Asmelash (2002), among the measures needed to support MSE development are:

- (a) Undertake a thorough review of the policy and regulatory environment with the aim of determining their weaknesses and learning from best practices within and outside Africa and revamp their laws, regulations and procedures in a manner that will stimulate the growth of MSEs;
- (b) Regularly review policies to determine their effectiveness; and
- (c) Continued effort to harmonize laws, regulations and procedures at national and regional levels;

Considering that it has been years since the MSE strategy was adopted and the time lapsed is sufficient for the policies & measures to be implemented and the intended support be delivered through the system, it is time to take stock. In light of the importance the strategy gave to improving and simplifying the business environment, having a close look at whether and the extent to which the promised improvements have materialised, regulatory constraints relaxed and intended institutional supports delivered is in order. This was one of the motivations for the 2003 MSE survey. While the survey generated a large data set with detailed information on various aspects of MSEs, in what follows, we analyse the data on ownership, nature of acquisition & financing; policy/regulatory changes and their impact on development of the MSE sector as well as remaining regulatory constraints as perceived by MSE operators.

4. Profile of sample MSEs/MSE operators

The survey results indicate that sole proprietorship is the single dominant form of ownership among the sample firms, accounting for 94 per cent. It is usually argued that *micro* and *small* enterprises are different in that the former tend to operate on informal basis or as sole proprietorship, thereby making separation between finances of the owner's household and that of the enterprise difficult. In our case, however, disaggregating the data by *size* indicates that this cannot be taken as a distinguishing characteristic since the proportions of sole proprietorships are comparable: 91 per cent for small enterprises compared to 96 per cent for micro. Legal status, strictly speaking, refers to legally established formal enterprises while we were also

interested to know to what extent capital *pooling* (i.e. joint ownership) is practiced among MSE operators. Accordingly, we asked about the number of owners involved. About 93 per cent have single-owners, indicating that the practice of pooling of capital by a group of individuals as way to over come the problem of start-up capital has yet to develop in Ethiopia.

In terms of gender, male-owned MSEs dominate: 74 per cent of the sample firms are male-only enterprises compared to 23 per cent for female; the rest have mixed ownership (i.e. male-female partnerships). The situation does not change when we split the sample into micro and small categories: that is, male-operators dominate in both, accounting for 74 per cent. These contrasts with the situation in other countries: for example, in Liedholm and Mead (1999), which is based on survey data from 12 countries⁷, it is reported that “the majority of MSEs in most countries are owned and operated by women”. About 80 per cent are registered (72 per cent of the micro compared to 90 per cent of small) while about 75 per cent have operating license (66 per cent of the micro compared to 88 per cent of small enterprises).

Most MSEs are young, the median⁸ age being 5 years. It appears that a significant proportion of the MSEs are firms that emerged taking advantage of opportunities created by the reform: 79 per cent of the sample MSEs were established in 1993 or after (and 45 per cent established in 1999 or after), compared to only 15.5 per cent during the entire Derg period. Disaggregating by size, the survey data reveals that 48 per cent of the micro enterprises were established before 1999 (i.e. are older than 5 years) while 21 per cent were established before 1993 (meaning they have been in business for more than 10 years). The latter is striking since it shows that so many of them remained micro (i.e. did not grow) for such a long time.

They are also owned/run by relatively young operators, the mean age being 36 years (but have a relatively large household size, averaging 5.8 persons). Although most operators were born outside the town in which they are operating, they have long-residence (17 years on the average). In terms of the micro vs small category, *micro* operators tend to be younger (mean age being 34 years compared to 40 for small

⁷ These were surveys undertaken as part of the USAID-funded GEMINI project in Botswana, Kenya, Malawi, Swaziland, Zimbabwe, Dominican Republic, Guinea, Jamaica, Lesotho, Niger, Nigeria, and South Africa covering more than 65,000 MSEs.

⁸ Throughout the report, we use the median instead of the arithmetic mean whenever the distribution of a variable is skewed.

enterprise operators) and have smaller household size (5.2 compared to 6.7 persons).

A good proportion (about 42 per cent) of the operators had at least some high school education (grade 9-12) while close to 12 per cent had education above grade 12 (including university degree) when starting their business (see Table 4.1). However, their education status does not seem to have changed much over the years since then as the proportions of those with these levels of education at the time of the survey are 44.6 per cent and 14.3 per cent, respectively. Most (87 per cent) did not have vocational or technical training. Nor did they receive such education after wards.

Table 4.1: Distribution of MSE owners by level of education at time of business start

Level of education	%
None	8.8
Grade 1- 4	19.2
Grade 5-8	24.2
Grade 9-12*	41.6
Above high school 12**	12.0

Source: EDRI, Micro and Small Enterprises Survey (2003), Addis Ababa

* This category includes those who reached grades 9 – 12, 10+1 and technical school diploma; ** includes those who attended (but not necessarily complete) 12+1, 12+2, 12+3, college diploma, and university degree programs.

There are two approaches to the emergence and expansion of MSEs and the increase in the number of people engaged in such activities. One approach perceives this as an outcome of *improved opportunities* for people (including the poor and disadvantaged) to participate in “ways that empower and nourish” them. According to the second approach, on the other hand, it is an indication of *failure* of an economy to provide productive jobs; forcing people to “take refuge in activities that provide only minimal subsistence support” (see Liedholm and Mead, 1999). While it may not be easy to sort this out (and there is probably some truth in both), in this survey, we attempted to get some information that may throw some light on the issue in the Ethiopian context. Accordingly, we asked respondents as to why they got into their respective specific business activities (summarised in Table 4.2).

The four most frequent responses obtained are: (i) “I thought it would be profitable” (44 per cent); (ii) “I am skilled in this activity” (38 per cent); (iii) “this is the only thing I was able to do, I had no alternative” (32 per cent); and (iv) “parents/relatives are/were

in this business” (17 per cent)⁹. We can see from the responses that the situation is more complex than could be explained by one or the other of the above approaches. Reasons (i) and (ii) suggest that many MSEs were picked by operators with options that exercised *choice* in picking their respective businesses based on consideration of expected *profitability* or comparative advantage in *skill*. On the other hand, from the third reason, a good number of MSEs were taken as *activities of last resort* by individuals searching for ways to sustain themselves. This is in congruence with the fact that 14 per cent of the MSE operators were retrenched/laid-off from a public sector job (i.e. retrenched/laid-off former civil servants, employees of State Owned Enterprises (SOEs), and demobilised soldiers/fighters). That many operators regard MSEs as activities of last resort seems to suggest, among other things, the need for measures to cultivate positive attitude, especially among the educated urban youth, such that they regard MSEs as respectable business activities worth being engaged in.

Table 4.2: Reasons for getting into the specific business (%)

Reasons	micro	small	Male-owned	Female-owned	Total
Skilled in this activity	35.2	42.6	41.3	29.6	38.4
Parents/relatives in this business	16.2	17.0	15.2	19.0	16.5
Thought would be profitable	39.9	48.5	46.8	32.7	43.6
Capital requirement matched what I had	15.2	17.0	16.5	15.5	16.0
Little/no regulatory restrictions	6.0	5.4	4.6	9.3	5.7
I had no alternative	38.3	24.6	30.9	38.1	32.3

Source: EDRI, Micro and Small Enterprises Survey (2003), Addis Ababa

Looking at the same issue by size, about 38 per cent of the micro enterprises cited lack of alternative as the reason for getting into their respective specific business activity compared to 25 per cent for small enterprises while profitability and skill factors were cited as the reasons by about 49 per cent and 43 per cent of the small enterprises (compared to 40 and 35 per cent for micro enterprises).

In terms of gender, the proportions reporting to have been attracted by expected profit and skill considerations are higher for male-owned than female-owned enterprises. A higher proportion of the female-owned enterprises cited lack of other alternative as the reason for getting into the business under consideration, indicating that resort to MSEs as a *sustenance mechanism* is more common among female operators. It is not clear what explains this, though.

⁹ Note that percent figures do not add up to 100% since respondents were allowed to give multiple responses.

Most MSE operators had some prior business experience: 42 per cent did apprenticeship in similar business (for more than a year on the average) while 76 per cent also reported having several years of experience in business in general. Respondents were also asked what they were doing immediately before starting their business and whether their experience (if any) was useful to the current business. More than 57 per cent were working in businesses (of same or different type as their current business) either as owners, employees or apprentices while 6 per cent were working in the public sector (19 per cent were in school and 7 per cent had never been employed). This seems to be consistent with the hypothesis that 'workers, having developed their skills at a work place and gaining exposure to market conditions, abandon their employment and start their own businesses'. About 79 per cent reported that they found their previous business experience to be very helpful in their current business.

More than 87 per cent of the MSEs started their current operations from scratch with relatively small start-up capital (median of Birr 2,077). They were mainly financed out of the owner's personal savings (accounting for 58 per cent on the average) followed by grant money from relatives/friends¹⁰ (17 per cent), savings from other own business (10 per cent), and borrowing from relatives/friends (5 per cent)¹¹. The importance of Iqub/Iddir as source of start-up capital is not as high as usually believed: only 22 and 9 firms respectively (partially or fully) financed their start-up capital using cash from Iqub/Iddir and borrowing from Iqub/Iddir. An early study (Fasika and Daniel, 1997) had found the sources of start-up capital for MSEs to be (a) personal savings; (b) borrowing from friends and relatives; (c) inheritance; and (d) bank and suppliers loans. They indicate that 68 per cent of the enterprises reported that personal savings were the main sources of finance to start new business, followed by borrowings from friends and relatives (18 per cent) and inheritance (7 per cent). Bank loans accounted for an insignificant proportion (2 per cent).

Of those who started their business from scratch, 58 per cent did so because they prefer to work for themselves while expectation of better income from engagement in small business activity and inability to find wage employment, respectively, were the reasons for 15 per cent and 13 per cent. The other two ways through which MSE operators acquired their business were inheritance and purchase, accounting for 9 per cent and 4 per cent,

¹⁰ MSE operators may receive loans from their relatives/friends who charge them interest. For our purposes such lenders are considered as moneylenders.

¹¹The rest being covered by cash from liquidation of other business (2%), support from NGO/government institutions (1.6%), bank loans (1.5%), cash from Iqub/Iddir (1.5%), etc.

respectively. Contrary to expectations, acquisition through inheritance is relatively rare. One plausible explanation is that the small size of the private sector itself (due to the nationalisation and subsequent suppression of the private sector by the Derg) meant that many of those reaching old age did not own enterprises that they could transfer to their off springs through inheritance. That most of the MSEs and their owners are recently established young firms seems consistent with this.

Regarding business premises, a significant proportion (71 per cent) started in rented premises, paying median monthly rent of Birr 200 (which reached Birr 273 at the time of the survey - a 37 per cent increase), 13 per cent were using own premises while 4 per cent bought it¹². For those who had to purchase a premise, the median price amounted to Birr 40,000 (*4 times* their average start-up capital). Most (about 84 per cent) of the MSEs are still operating in the very premises where they started: only about 16 per cent relocated, mainly due to better location, lower rent or acquisition of own house (57 per cent); expulsion by the landlord (20 per cent) or need for larger space resulting from expansion of the business (16 per cent). The proportion of MSEs operating from home (i.e. using their residences which also *double* as business premises) is 16 per cent.

Only about 17 per cent of the sample MSEs are one-person enterprises operated by their proprietors. So, self-employment does not appear to be a central characteristic of these enterprises. The average number of workers (excluding apprentices), at the time of the survey, is 3.7 implying that, on the average, each enterprise provides employment to 2.7 persons (other than the owner).

Contrary to the common belief that MSE operators do not use delegation system, a big proportion (85 per cent) of the sample MSE operators normally delegate someone to run the business in their absence. However, most (68.9 per cent) seem to use 'kinship' (which may be a measure of trust) rather than *competence* as selection criteria for delegation. For those that do not delegate, the main reasons are that they work alone, hence have no one to delegate (37 per cent), lack of reliable person (29 per cent), no need to delegate since they are always present (13 per cent), and lack of skilled labour (12 per cent).

In terms of composition, family labour (composed of working owners plus unpaid family members with active involvement in the enterprise) constitutes a significant

¹² The rest either used building/premises acquired through inheritance or lease, or operated on a road-side.

proportion of the MSE labour force: the mean ratio of family labour to total workers (working owners plus paid and unpaid workers plus trainees/apprentices) is 59 per cent. The share of hired labour, which comprises 39 per cent on the average, is high while the share of trainees/apprentices is negligible (averaging 1.7 per cent): this contrasts with the situation in West Africa as reported in Liedholm and Mead (1999¹³). It is interesting that the number of child workers (aged 14 or below) working in MSEs is small, contrary to expectations: out of the total 3,259 workforce, there were only 39 children engaged as paid or unpaid workers or apprentices at the time of the survey.

5. MSE business environment: the evidence

5.1 Policy changes and impact

International donor communities such as ILO, GTZ, etc provided very limited financial and technical support to the MSE sector. According to Zewdie and Associates (2002), the Regional Trade, Industry, and Tourism Bureaus, in addition to their regulatory role, are involved in the provision of business development services: they provided limited training on business, based on the ILO training packages, and delivered some marketing services by organising trade fair and providing market price information. The Ministries of Education and Labour and Social Affairs, which have regional structures throughout the country, are also involved in delivering short-term skill training and long-term vocational and technical training to potential MSE operators.

However, data from the present survey shows that *availability* of such services is far from satisfactory. Since 1991, there has been recognition of the role of the MSE sector in employment creation and economic growth (as opposed to being viewed as marginal and unproductive, tax evader, and with limited contribution to economic growth). Yet, more than 95 per cent of the MSE operators surveyed indicated that they did not receive any support, whatsoever, to promote their activities (Table 5.1). In spite of the attempts to liberalise and improve the policy and regulatory environment, the survey data indicates that there is divergence between policies and directives issued and the *actual practice* on the ground. Concrete and coordinated

¹³ Based on survey data, Liedholm and Mead (1999) found that 'only in a few countries do hired workers comprise as much as 20% of the MSE labor force. Botswana and the Dominican Republic stand out in this regard: in those countries, over a third of the labor force is made up of hired workers. Trainees and apprentices add a significant share of workers in some locations, particularly in West Africa; in Southern Africa, as in other parts of the Third World, the survey results indicate that apprentices comprise less than 10% of the MSE labor force' (Liedholm and Mead 1999, p. 4).

institutional support such as infrastructure facilities like business premises, water and power; financial services; extension services; assistance in the transfer of technologies; promotion of marketing facilities; and provision of training on sustainable basis have yet to be provided. The establishment of the MSE Development Council (composed of the federal government, local governments, private sector representatives, and MSE operators) at the Prime Minister Office and Regional Government Administration levels may be one option to surmount the coordination difficulties in the MSE sector. The Council's mandate and modus operandi should promote an effective consultative and participative process in policy formulation and implementation.

Table 5.1: Per cent of MSEs receiving institutional support

Did you receive support from:	Yes		No	
	No.	%	No.	%
Donors	1	0.2	972	99.8
International NGOs	7	0.7	967	99.3
Local NGOs	4	0.4	970	99.6
Governments projects/institutions	24	2.5	950	97.5
Training providers	7	0.7	967	99.3
Banks	45	4.6	929	95.4
Microfinance institutions	27	2.8	947	97.2
Cooperatives	3	0.3	971	99.7
Business associations	20	2.1	954	97.9
Other institutions	28	2.9	946	97.1

Source: EDRI, Micro and Small Enterprises Survey (2003), Addis Ababa.

Generally, policy reform and liberalization are expected to have a positive impact on competition, production and productivity of MSEs. However, putting an enabling policy environment in place by itself may not be sufficient to ensure optimal results. The response to the new opportunities opened-up by the reform is likely to depend on, among other things, the degree to which MSE operators can access resources such as skill, technologies, finance, infrastructure, markets, etc. In the present survey, we investigated whether or not the policy environment, as perceived by the MSEs in our sample that existed before¹⁴ 1993, has improved following the 1993 policy reform and looked at MSEs' ratings, on 5-points scale (1 = 'increased a lot'; 5 = 'no change'), of changes in investment, competition, infrastructure availability, access to finance,

¹⁴ Limiting it to this group of MSEs is appropriate because they operated under both the pre-reform and post-reform policy environments, hence are in a better position to compare the two.

tax, market and prices. We also investigated whether there has been an improvement in the licensing procedure over the past decade. The results are summarised in Tables 5.2 to 5.6. The results show that a lot remains to be done to create an enabling policy environment for the MSE sector.

We observe from Table 5.2 that about 56 per cent of the MSE operators that were in existence before 1993 reported that the policy environment has not improved for the MSE sector after the reform: only about 33 per cent reported an improvement in the environment. Disaggregated by size, the proportion is higher for small enterprises: It appears that the change in policy had relatively higher positive impact on small enterprise operators compared to micro. As Table 5.3 reveals, the licensing procedure in the MSE sector has improved over the past decade: about 73 per cent of the small and 63 per cent of the micro enterprise operators reported so. However, a good number of MSEs (about 11 per cent) failed to notice any improvement suggesting the need for more work in this respect.

Table 5.2: The post-reform policy environment as perceived by MSE operators

Improved after 1993?	Micro enterprises		Small enterprises		Total	
	No.	%	No.	%	No.	%
Yes	43	28.7	58	37.7	101	33.2
No	86	57.3	84	54.5	170	55.9
Do not know	21	14.0	12	7.8	33	10.9
Total	150	100	154	100	304	100

Source: EDRI, Micro and Small Enterprises Survey (2003), Addis Ababa

Table 5.3: Improvement in the licensing procedure in the last ten years

Responses	Micro enterprises		Small enterprises		Total	
	No.	%	No.	%	No.	%
Yes	285	63.33	265	73.2	550	67.7
No	50	11.1	40	11.0	90	11.1
Do not know	115	25.6	57	15.7	172	21.2
Total	450	100	362	100	812	100

Source: EDRI, Micro and Small Enterprises Survey (2003), Addis Ababa

The reform process is expected to increase private investment and competition in the economy. Potentially, MSEs in Ethiopia face competition from three main sources: (a) imports; (b) large-scale enterprises; and (c) other MSEs. Market liberalization, trade liberalization in particular, enables importers to bring in goods that undercut the market for local MSE products; that is, MSEs face stiff competition from imported

goods which may be of relatively higher *quality* and lower *prices*. Although this may encourage healthy competition and improve quality of MSE products, it could also constrain development of the MSE sector.

Taken together, the data summarised in Tables 5.2, 5.3 and 5.4 indicate that investment and competition have increased after the market liberalization process. About 76 per cent of the MSE operators reported increase in investment (Table 5.2). The reform appears to have helped the market for MSE products to expand: about 59 per cent reported increases in the size of the market after the reform. So has competition: Competition from other MSEs and from imports were reported to have increased by about 91 per cent and 51 per cent, respectively. Regarding infrastructure and delivery of financial services, about 79 per cent and 47 per cent of the MSE operators, respectively, indicated an increase after the reform.

Rises in tax rates and tax administration/enforcement after the reform have been reported by about 68 per cent and 54 per cent of the MSE operators, respectively. Both prices of inputs and products of MSEs have also increased after liberalization. What is not clear however is what explains the simultaneous increase in competition and output prices. The reported rise in taxes and/or better tax enforcement over former evaders may be at least part of the explanation.

Disaggregated by size, the data (Tables 5.3 and 5.4) shows similar pattern for both micro and small enterprises. Both reported that investment, competition among MSEs and with imported goods, infrastructure, access to finance, tax rate, tax administration, size of output market, as well as product and input prices have increased after the reform. The percentage increases were relatively higher for small enterprises compared to micro.

About 28 per cent (25 per cent of the micro and 32 per cent of small enterprise operators) reported increased government support to the MSE sector. However, almost as many (about 25 per cent – 45 per cent of the micro and 14 per cent of the small) MSEs indicated that there was no change. Even more worrying is that a good percentage (about 20 per cent) reported *deterioration* in government support after liberalization.

A good number of MSEs reported that access to non-labour physical inputs has either become more difficult (16 per cent) or not changed much (31.3 per cent). The basic conclusion from Tables 5.2, 5.3 and 5.4 is that although market liberalization appears to encourage MSE operators, there is a long way to go by way of improving support to the sector.

Table 5.4: Changes observed in the micro and small enterprise sector after the reform

Changes	Increased a lot		Increased slightly		Decreased a lot		Decreased slightly		No change		Do not know		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Investment	169	24.4	356	51.3	20	2.9	27	3.9	62	8.9	60	8.6	694	100
Competition (imports)	107	22.2	139	28.8	15	3.1	8	1.7	79	16.4	135	28.0	483	100
Competition (domestic)	330	47.6	301	43.4	17	2.4	9	1.3	17	2.4	20	2.9	694	100
Infrastructure	158	22.8	390	56.3	45	6.5	15	2.2	60	8.7	25	3.6	693	100
Support of government	40	6.0	149	22.2	96	14.3	40	6.0	290	43.2	57	8.5	672	100
Access to finance	80	11.9	239	35.7	45	6.7	16	2.4	183	27.3	107	16.0	670	100
Tax rate	255	38.7	194	29.4	22	3.3	38	5.8	42	6.4	108	16.4	659	100
Tax administration	151	22.9	204	30.9	76	11.5	65	9.8	49	7.4	115	17.4	66	100
Size of the market	173	24.9	240	34.5	83	11.9	155	22.3	31	4.5	14	2.0	696	100
Price of your product	126	18.3	326	47.7	39	5.7	77	11.2	105	15.2	14	2.0	690	100
Price of input	175	25.6	334	48.8	38	5.6	63	9.2	58	8.5	16	2.3	684	100

Source: EDRI, Micro and Small Enterprises Survey (2003), Addis Ababa

5.2. Current policy/regulatory constraints

A host of rules/regulations related questions (ranging from *entry* barriers to taxes, environment protection, consumer protection and quality control, workers' welfare, finance, enforcement mechanisms, and competition) were included in the survey instrument to capture respondents' assessment of them as they impinge on their businesses. For instance, respondents were given a long list of factors and asked to rank, on a four-point scale (0 = 'not a problem' to 4 = 'very sever problem'), the severity of each as a constraint to their business. They were also given lists of (a) 'rules/regulations' related and (b) 'market-related'¹⁵ obstacles and, in each case, asked to identify, in order of importance, what the three most important hindrances *were* to the growth/expansion of their business in the *past*. Elsewhere, they were also asked to identify, in order of importance, what the three most important obstacles *will be* (be they rule/regulation-related or market-related) if they were to expand their

¹⁵ We would like to note, however, that this classification involves some degree of arbitrariness since some factors do not neatly fall into one or the other category.

business *now*. In this case, we deliberately refrained from providing a list of possible factors/obstacles, letting respondents to identify them instead, partly in order to check the consistency in respondents' identification and rating of problems/obstacles and partly to see if the factors have changed over time. We also asked about their perceptions and expectations related to changes in policy/rules/regulations and implementation. The results are summarised below.

Of the factors rated as very severe problem, the top five are high taxes, inefficient/arbitrary tax administration, high collateral requirement, lack of/inadequate business premise and lack of business support services in that order. Considering factors that are rated as major problem or higher, we have high taxes (51 per cent), high collateral requirement (47 per cent), inefficient/arbitrary tax administration (44 per cent), lack of/inadequate business premise (42 per cent), lack of business support services (41 per cent), and lack of/inadequate access to credit (39 per cent) figure out prominently. Other factors rated as major or very severe problem by a good number of MSEs include: bureaucratic requirements (red tape and paper work) (23 per cent); penalties (including kickbacks to officials) for operating without license, if and when detected (20 per cent); weak legal enforcement (19 per cent); crime and theft (19 per cent); competition (16 per cent); entry regulation (15 per cent); and inability to use the institutional enforcement mechanism (legal & judicial system and police) (15 per cent). This contrasts clearly with the situation in Kenya, where issues of tax, business premise, and bureaucratic requirements/regulation/harassment do not appear as major problems (See GEMINI 1995).

It is possible that the complaint about taxes being too high may partly reflect stricter enforcement of tax collection now compared to the past: for those who were not paying taxes before (due to evasion or otherwise) even a modest tax may be regarded as too high. But, could it also be that MSEs, not fully aware of the taxes they are required to pay, end up paying more as it happened in Tanzania¹⁶? There could be yet another explanation once we recognize that, in the absence of book accounts, small businesses pay taxes as assessed by tax officers: tax officers may deliberately *overestimate* MSEs' tax obligations (taxable income) in order to force them to give kickbacks in return for underestimating their taxable income. Results of the Ethiopia Firm Survey (EDRI/World Bank (2003) also indicate that high taxes are among the major problems facing medium and large enterprises in Ethiopia.

¹⁶ Bagachwa (1993) reported that in Tanzania, although sales tax was imposed on final products only, inputs to be used in processing being exempted, small firms, lacking proper information were unaware of this and ended up paying sales taxes on inputs and outputs.

Considering the wide spread complaints (by MSEs as well as medium and large firms alike) about taxes being too high (despite the fact that the marginal business tax is 30 per cent) and the alternative explanations, it may be worthwhile to do a case study that would help us understand what exactly the problem is. It is also striking that about 14 per cent of the MSEs reported being robbed in the past 2 years, which is on the high side considering that the firms surveyed are in major urban towns.

A vast majority of respondents did not regard rules/regulations related to the welfare of workers (i.e. rules on free hiring and firing, minimum wages and fringe benefits, protection to unions and union pressure) and skill inadequacy as problems. The former may be either because they are not subject to the labor law or manage to evade it with relative ease. Interestingly, regulations related to environment protection, consumer protection and quality control did not rank high either, probably reflecting that such regulations either do not exist or can be evaded. We looked at the issue by splitting the data into the licensed and unlicensed MSE sub-samples to see whether being licensed or not make difference. No noticeable difference exists: licensed and unlicensed MSEs alike do not consider these factors as posing serious problems.

We also examined the issue by disaggregating the data by size and gender (see Figures 2 and 3). High tax rates (59 per cent), inefficient/discretionary tax administration (55 per cent) and high collateral requirement (46 per cent) are the three main constrains for small enterprises, which are somewhat reversed for micro enterprises (as high collateral requirement (48 per cent), high tax rates (44 per cent), and lack of/inadequate business premise (44 per cent)). A much higher proportion of small enterprises rated high tax rates, inefficient/discretionary tax administration and bureaucratic burden as major or very severe problems compared to micro enterprises. Could this difference be due to the higher possibility for tax evasion among micro enterprises, partly because they are outside the regulatory system due to their informal nature¹⁷ and/or many micro enterprises not being required to pay tax. In terms of gender, it is interesting to note that there is a noticeable difference between

¹⁷ In fact, according to one approach, mainly advocated by Hernando de Soto, being informal is the result of a *rational* decision by economic units that decide to “stay totally or partially outside the legal system by weighing the *costs* of being legal against its *benefits* and by considering the firm’s individual restrictions, such as financial capital availability” in a situation where *regulations* are *excessive* and the system of *monitoring* [and enforcing] compliance is *inefficient and/or corrupt* (Braun, and Loayza, 1994). The *effective* burden of regulation on business (and the potential for corruption, hence the incentive to become informal and remain informal) depends not only on *the rules* but also on the *extent of discretion* of officials in interpreting and implementing them (see Johnson, Kaufmann and Zoido-Lobaton, 1998).

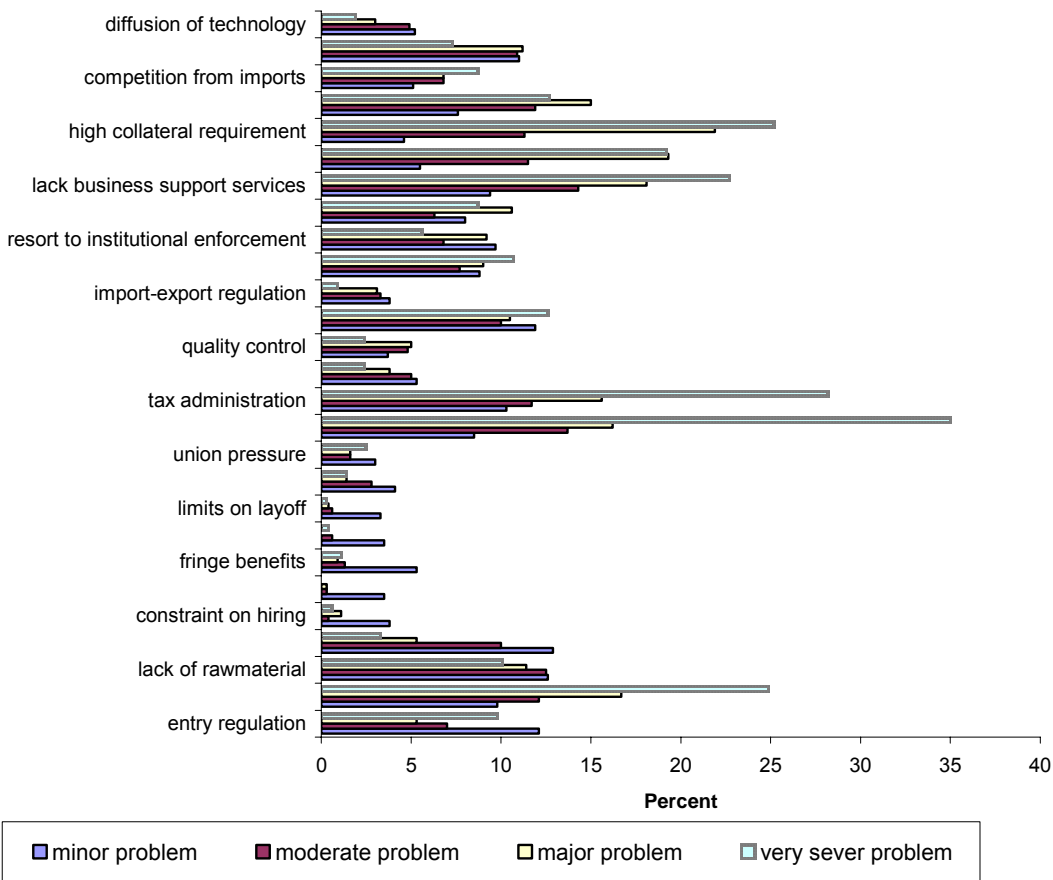
the proportion of male- and female-owned enterprises that rated high tax rates and inefficient/discretionary tax administration as major or very severe constraints in that it is higher for the former (for which we have no obvious explanation) while the proportion that gave similar rating to credit-access constraint are about the same.

One of the principles of good regulation is *consistency*¹⁸ in the sense of being "predictable so that people know where they stand". *Perceived* predictability of laws and policies and credibility constitute an important part of the business environment, hence are crucial for business decisions. Perceptions and expectations influence business decision: It is not whether they are *right* or *wrong* that matters, but *how strongly* they are held by economic agents. In order to assess these, we included in the survey questions designed to capture respondents' *perceptions* of the predictability of changes in laws/rules and policies relevant to their respective businesses; their expectations of government's *adherence* to its *announced* policies and laws and *effectiveness* in implementing them; as well as *perceptions* regarding the extent of *participation* of the business sector in the process of designing new rules and regulations. The results are summarised in figures 4 and 5. In this respect, a high proportion of MSE operators reported that they have to cope, on regular basis, with "unexpected changes in rules, laws or policies which materially affect their enterprise": about 36 per cent for the whole sample, 42 per cent for small and 32 per cent for micro enterprises. Disaggregated by gender of owner, the figures are 38 per cent for male-owned as opposed to 29 per cent for female-owned enterprises.

The perceived policy predictability is quite low among the sample MSEs: only about 34 per cent feel some degree of predictability (ranging from completely predictable to fairly predictable) of changes in laws, rules and policies. The figures are very similar for the micro- and small-samples: about 33 per cent for the former and 36 per cent for the latter. Moreover, there appears to be a wide spread *credibility* problem: as high as 40 per cent (41 per cent for micro and 39 per cent for small) do not believe that the government adheres to its announced policies and rules. Taken at their face value, the figures suggest that the prevailing perceptions and expectations (regardless of whether they are right or wrong) are not likely to encourage MSE operators to expand their businesses.

¹⁸ the others being transparency, accountability, proportionate to risk, and targeted or focused on the problem with minimal side effects (see Good Regulation Task Force, www.nao.gov.uk/publications/nao_reports/index.html#2001-2002).

Figure 1 Main constraints of MSE operators



Both *accessing* the formal sector (i.e. becoming formal) and *staying* formal are costly to the operator. Cost of access includes registration/license fees, required registration time (due to bureaucratic rules and inefficient public service) while the costs of staying formal are of three broad types: taxes, regulations (e.g. related to welfare of workers, environment protection, consumer protection and quality standard, etc.), and bureaucratic requirements. Studies in other countries show that the costs of entry into the formal sector and staying formal could be significant (see Braun and Loayza, 1994). Note that these are costs that can be avoided/evaded by being informal. So, in the survey, we asked enterprises a series of questions related to their registration and license status and reasons for not registering or being licensed, etc.

Figure 2: Factors and percent of respondents rating them as major or very sever constraint to business

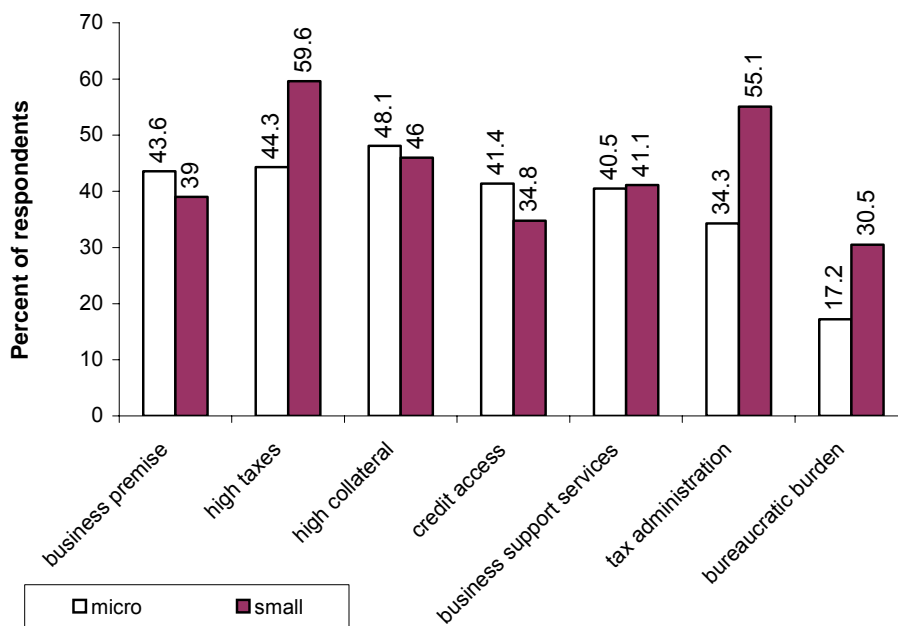


Figure 3: Factors and percent of respondents rating them as major or very sever constraints

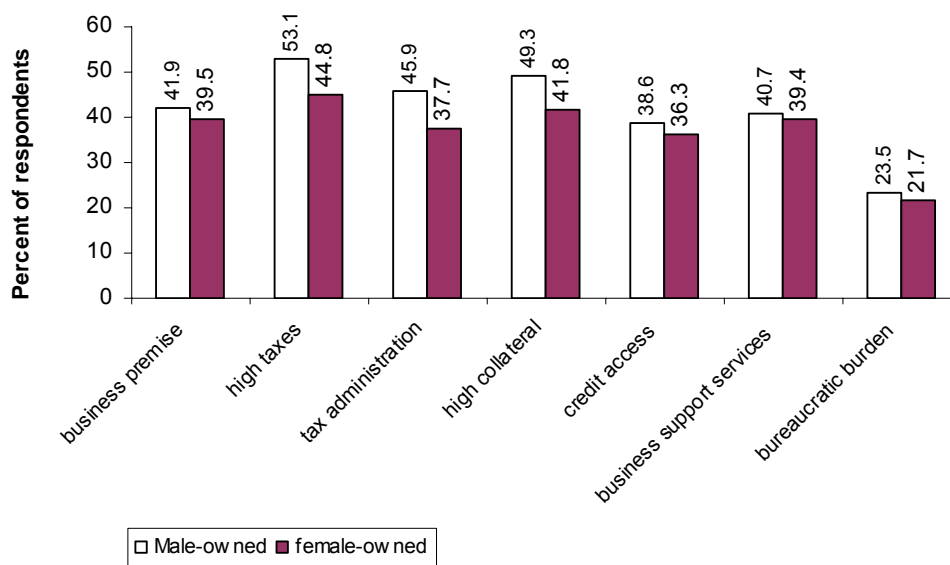


Figure 4: Perceived degree of predictability of changes in laws, rules & policies

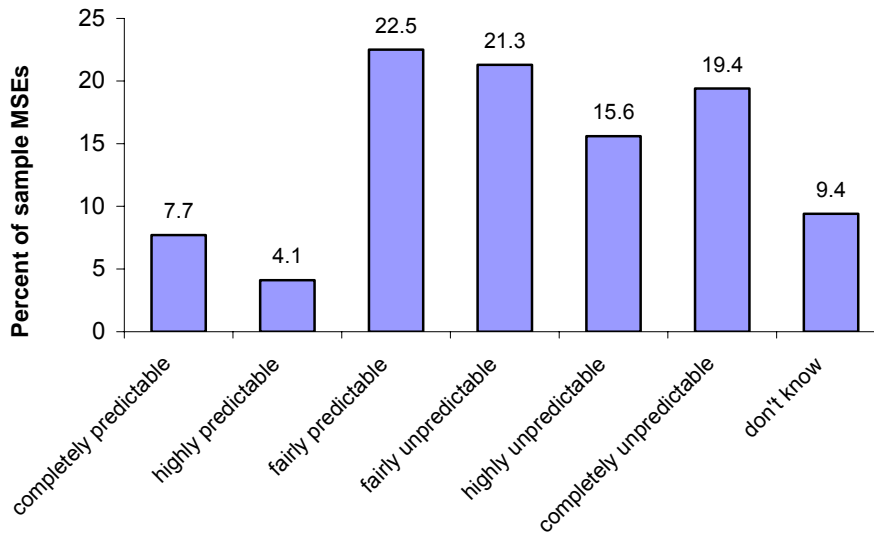
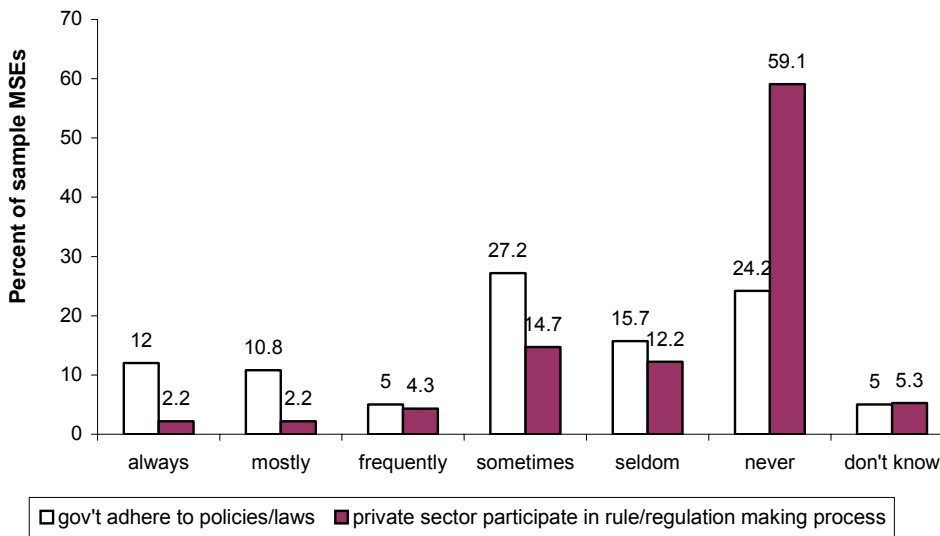


Figure 5: Expected government adherence to & implementation of policies/laws and degree of business sector participation in designing rules/regulations



The data shows that 80 per cent of the sample MSEs are registered while about 3/4th have license (work permit). In terms of size category, only 72 per cent of the micro enterprises are registered compared to 90 per cent for small enterprises. Sample MSEs that are not registered or licensed were asked about the reason(s) for not doing so. For those not registered, the most common reasons are: that 'business is too small to need license' (51 per cent); 'no benefits to registering' (20 per cent); and 'taxes too high' (13 per cent). Similarly, of those that have no license, 73 per cent cited 'business too small' as the reason. Other reasons cited include: "I do not need a license, I can do without one" (9 per cent); "cumbersome licensing procedure" (6 per cent); and "licensing costs (initial and renewal) too expensive"(5 per cent).

However, being informal is not without cost either: it involves costs in the form of penalties (or bribes to escape penalty) upon detection and forgone benefits of not being able to "take full advantage of government-provided goods" (Braun and Loayza, 1994). Accordingly, we asked MSEs about the *perceived* benefits (if any) of registering and having a license (without any attempt to quantify): while 36 per cent and 24 per cent, respectively, do not see any benefits in registering and being licensed, most of the remaining identified various kinds of benefits. Among the benefits cited are that: "I would not have to hide from/give bribe to government officials" (47 per cent); "I will be able to apply for credit" (17 per cent); "I can apply for land/business premise" (10 per cent¹⁹); "increased customers" (9 per cent); and "I can buy raw materials in bulk" (7 per cent).

It is also interesting to note that none of the sample MSEs resorted to the court system to resolve disputes (with suppliers as well as customers). This is despite the fact that 80% are registered, that more than 75 per cent are licensed, and that many cases of contractual breach and robbery are reported: for example, failure on the part of suppliers to make timely delivery and to meet quality/standard were rated as major or very severe problems by 9 and 12 per cent respectively. While that MSEs do not use the court system may not necessarily be bad, it is not clear whether it is due to their *preference* for out-of-court settlement or because they are *discouraged* by (perceived or otherwise) *inefficiency* and *corruption* in the legal and judicial system.

We asked MSE operators whether the growth/expansion of the business under consideration has been their important objective and, if so, to cite, separately, the three main (a) regulations-related, and (b) market-related constraints/obstacles. The

¹⁹ Note that percent figures do not add up to 100 since multiple answers were allowed.

first question was motivated by our anticipation that some may take up MSE activity only as *temporary*²⁰ engagement (until a 'better' alternative comes along) in which case growth/expansion may not be their overriding objective, rendering the issue of obstacles to growth less relevant for them. Results are summarised in Table 5.5. While, as one might expect, a significant proportion (85 per cent) had growth as a primary objective, this was not the case for as many as 15 per cent of the sample MSEs. While the reason for the latter is not clear, one possible explanation could be a 'survivalist' attitude among operators (i.e. operators being concerned primarily about the survival of their business) causing reluctance to undertake potentially risky expansion.

Some argue that male and female entrepreneurs have different goals regarding firm growth/expansion in that the latter are concerned about "income stability and economic security", hence "may be more prone to avoid taking the risks involved with firm expansion and hence may be more likely to diversify" rather than expand an existing enterprise (Downing, 2001). Female operators' "dual domestic and productive responsibilities may also hamper growth" and may also mean that business profits are more likely to be used to maintain household consumption (Berger 1989 as cited in Liedholm and Mead, 1999) rather than expansion. This does not, however, seem to be born out by our data. The proportion of male and female entrepreneurs that reported having growth/expansion of their business as a major goal are not very different: 86 per cent for male entrepreneurs compared to 81 per cent for female. However, there appears to be a noticeable difference between micro and small operators: 81 per cent of the former reported having growth/expansion as an important objective relative to 90 per cent for the latter. This is not consistent with our expectation: we expect intention/desire to grow to be more common among micro enterprises, partly because growth is likely to be easier for such enterprises: the higher one is on the size ladder, the more difficult growth becomes.

As for the rules/regulations related obstacles to growth/expansion, high taxes (57 per cent), lack of/inadequate business premise (49 per cent), power interruption (38 per cent) and tax administration (37 per cent) were cited among the top three (see Table 5.5a). To probe the issue a bit further, we looked at the factors singled out as primary. As Table 5.6 shows, lack of/inadequate business premise, high taxes, and power interruption come on top: being identified as primary by 32, 26, and 9 per cent respectively.

²⁰ which was *confirmed* by the data since, as discussed in section 3, about 32% of the MSE operators reported *lack of any other alternative* as the reason for getting into their respective current businesses.

On the other hand, the market-related constraints/obstacles identified to be among the top

Table 5.5: Rule/regulation related obstacles and percent of MSEs reporting them among the top three impediments to business

(a) Rule/regulation related obstacles and percent of MSEs reporting them among the top three

Obstacle	Micro	Small	Male-owned	Female-owned	Total
High tax rate	51.7	63.1	58.4	49.9	56.8
Lack of/inadequate business premise	53.9	42.7	50.7	44.4	48.6
Power interruption	31.1	45.2	37.5	38.2	38.0
Inefficient/discretionary tax administration	32.1	42.5	38.3	33.0	37.0

(b) Market-related obstacles and percent of MSEs reporting them among the top three

Obstacle	Micro	Small	Male-owned	Female-owned	Total
Shortage of capital	90.3	83.3	86.5	90.5	87.3
Inadequate/uncertain market	55.7	58.9	59.2	51.6	57.1
Credit access	51.9	40.8	46.7	45.5	46.9
Inadequate business services	39.3	44.4	37.7	52.9	41.5

(c) Factors and percent of MSEs reporting them among the top three constraints to growth at present

Obstacle	Micro	Small	Male-owned	Female-owned	Total
Shortage of capital	87.1	79.3	84.1	83.8	83.9
Inadequate/uncertain market	38.1	38.1	38.2	36.5	35.1
Inadequate business premise	46.4	43.2	46.4	44.2	44.9
High tax	22.8	32.1	27.7	25.4	26.9

Source: EDRI, Micro and Small Enterprises Survey (2003), Addis Ababa

three are shortage of capital (87 per cent), inadequate/uncertain market (57 per cent), constrained access to credit (47 per cent) and inadequate business support services (41 per cent) in that order (see Table 5.5). More specifically, 74 per cent singled out shortage of capital as the primary obstacle while 15 per cent identified inadequate/uncertain market.

It will be in order to see whether the constraints and problems enterprises face differ across enterprises and if so how. Such an understanding is crucial, partly to identify the particular policy support needs of each group and design appropriate

interventions accordingly. Therefore, we tried to examine whether the (rules/regulation-related and market-related) obstacles to growth/expansion identified and the ratings are different for micro vs small and male vs female-owned enterprises. As can be observed from Table 5.5b, the market-related factors identified as the three main obstacles and the order of importance basically remain unchanged when we disaggregate the data by enterprise size and by gender, although the percentage of firms identifying them differ. That is, micro and small enterprises as well as male and female entrepreneurs alike put *capital shortage*, *inadequate/uncertain market*, and *credit* access constraint, in that order, on top of the list. With respect to market-related factors singled out as primary constraints, again, as Table 5.5b indicates, capital shortage is the most critical for most MSEs in aggregate as well as for micro & small enterprises and male & female operators.

Table 5.6: Obstacles and percent of MSEs reporting them as *primary* constraints to growth/expansion

(a) Rule/regulation related obstacles and percent of MSEs reporting them as <i>primary</i>					
Obstacle	Micro	Small	Male-owned	Female-owned	Total
Lack of/inadequate business premise	34	28.9	32.4	31.5	31.8
High tax rate	21.8	32.3	26.1	25.9	26.4
Power interruption	7.1	12	8.9	10.2	9.3
Inefficient/discretionary tax administration	2.3	3.1	2.4	3.7	2.6
(b) Market-related obstacles and percent of MSEs reporting them as <i>primary</i> constraint in the <i>past</i>					
Obstacle	Micro	Small	Male-owned	Female-owned	Total
Shortage of capital	77.4	69.2	74	74.3	73.9
Inadequate/uncertain market	14.3	16.1	14.9	15.8	15.1
Inadequate business services	1.7	2.9	2.4	1.4	2.2
(c) Factors and percent of MSEs reporting them as the <i>current primary</i> constraints					
Obstacle	Micro	Small	Male-owned	Female-owned	Total
Shortage of capital	59.9	45.2	52.6	54.9	53.5
Inadequate/uncertain market	10.5	11.6	10.9	11.5	11.0
Inadequate business premise	8.2	12.1	10.4	8.8	9.9
High tax	4.0	8.7	5.8	7.5	6.1

Source: EDRI, Micro and Small Enterprises Survey (2003), Addis Ababa

It is also interesting to note that the market-related obstacles to business expansion have remained the same over time. Asked about the three main factors that pose hindrance if they were to expand their business now, MSE operators identified capital shortage (84 per cent), inadequate business premise (45 per cent), inadequate/uncertain market (35 per cent) and high taxes (27 per cent) in that order (Table 5.5c). In particular, shortage of capital was singled out as the primary constraint by 54 per cent while inadequate/uncertain market is the primary factor for the other 11 per cent (Table 5.6c), which were also reported (by 74 and 15 per cent respectively) to have been the primary obstacles in the past. These results of the survey data suggest, among other things, that interventions designed to provide credit services that are appropriate in terms of type, magnitude, maturity, etc. for such enterprises in urban areas may go a long way in promoting growth of MSEs.

6. Conclusion

The survey results indicate that investment, competition among MSEs and with imported goods, infrastructure, access to finance, tax rate, tax administration, size of output markets, product and input prices have increased after the reform process. About 76 per cent of the MSE operators reported increase in investment after the market liberalization. Increased competition after the reform among MSEs was reported by about 91 per cent while about 51 per cent stated that competition with imported goods has increased. About 79 per cent and 47 per cent of the MSE operators, respectively, indicated that infrastructure and delivery of financial services have increased after the reform. Although about 28 per cent of the respondents reported increased government support after the reform, almost as many (about 25 per cent) indicated that there was no change in government support to the MSE sector. Actually, a good percentage (about 20 per cent) revealed that government support has declined after the market liberalization, which is contrary to the common rhetoric of high and wide ranging support.

The major regulatory constraints of the MSE sector include high taxes, inefficient/arbitrary tax administration, high collateral requirement, lack of/inadequate business premise and lack of business support services in that order. Considering factors that are rated as major problem or higher, we have high taxes, high collateral requirement, inefficient/arbitrary tax administration, lack of/inadequate business premise, lack of business support services, and lack of/inadequate access to credit figure out prominently. Other factors rated as major or very severe problem by a good

number of MSEs include: bureaucratic requirements (red tape and paper work); penalties (including kickbacks to officials), if and when detected, for operating without license; weak legal enforcement; crime and theft; competition; entry regulation; and inability to use the institutional enforcement mechanism (legal and judicial system and police). Perceived policy predictability is a serious problem: only about 34 per cent feel some degree of predictability (ranging from completely predictable to fairly predictable) of changes in laws, rules and policies.

The problems of policy unpredictability in the form of “unexpected changes in rules, laws or policies that materially affect” MSEs and failure to adhere to policies as identified by respondents hardly indicate presence of enabling business environment, with implication on MSE development. The findings clearly imply a need to revisit the legal, regulatory and institutional framework in the country within which MSEs operate. National and regional legal & regulatory policies that balance legitimate controls and protection with the need for simplicity, impartiality and legal redress are required. These include avoiding frequent changes of policies, rules & regulations; adherence to adopted rules/regulations; protecting property rights to enforce contracts and the setting and upholding of core labour standards.

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The Ethiopian Manufacturing Sector: Competitiveness and the Way Ahead*¹

Getnet Alemu² and Admit Zerihun³

Abstract

Considering the structure of Ethiopian economy and the level of poverty, it would be interesting to examine to what extent Ethiopia's industrialisation effort has succeeded or failed in establishing internal and external competitiveness. Competitiveness is the way to face the challenges and to grasp the opportunities provided by globalisation. Thus, the need is not simply manufacturing expansion, but also to identify firms in which there is competitive advantage for selective intervention. Based on the analytical framework outlined in section 2 and considering the local context, this paper estimated domestic and international competitiveness of the Ethiopian manufacturing industry. We further developed a composite index criteria taking into account contribution to the economy, factor and raw material base, resource use efficiency, and competitive advantage in order to inform manufacturing policy for selective priority interventions.

It was found that Ethiopian experience in industrialisation and competitiveness is poor. In fact the existing competitiveness capacity of the sector is not good. What is most surprising is that the findings do not fully support what the government propagates with regard to manufacturing sector where the focus is based on resource-based theory. All the four-digit manufacturing activities in the textiles and leather sub-sectors prove to be uncompetitive even in the domestic market. The lesson drawn from this paper is that non-resource based firms can also be competitive through improved productivity and high learning rate.

* The final version of this article was submitted in July 2005.

¹ We would like to thank Worku Gebeyehu, participants of the Second International Conference on the Ethiopian Economy (June 3-5, 2004) and the two Anonymous referees of this journal for their comments on an earlier version of this paper.

² Institute of Development Research and Economics Department, Addis Ababa University.

³ Italian Embassy, Development Co-operation Office.

1. Introduction

The history of Ethiopian manufacturing industry is more or less related to the post Ethiopia-Italy war.⁴ In the second half of 1940s, there was very few manufacturing industry, which accounted for only 1% of the national income. Industrialisation really begun in the 1950s and was consolidated in the following three successive five-year developments plans.

With regard to the policy environment, following the Mutual Aid Agreement of 9 August 1943 with the United States of America (USA), the Ethiopian Government requested for a USA technical mission to be sent to Ethiopia to investigate the country's resources and its economic problems and to draw up an aid package for its development. The mission arrived in May 1944 and with their help, the Ethiopian Government initiated a ten-year programme of industrial development (1945-55). This was followed by the three successive Five-Year Development Plans (1958-1962, 1963-67 and 1969-74). Import substitution was recommended as the industrial strategy.

The Government placed much hope on the contribution of foreign capital. This was evident from its first measures in the area of economic policy, which gave emphasis to foreign direct investment. The issuance of 'Notice for the Encouragements of Foreign Capital Investment', in 1950, revealed little concern for indigenous investment. This policy gave a lot of incentives for foreign investors, which were not extended to existing or potential local investors until the issuance of the Investment Decree of 1963 and the 1966 Investment Proclamation. Despite the first five-year plan and the investment proclamation emphasis on the role of local investors, the 1966 Investment Proclamation provided a lot of incentives for those investments not less than \$200,000, which was beyond the reach of most local investors. As a result of this, most manufacturing firms were owned and operated by foreigners.⁵

After the collapse of the Imperial regime, the Derg nationalised enterprises involved in major economic activities and the private sector was allowed only to participate in small-scale industries and handicraft activities.⁶ With regard to industrialisation, there were not any economic plans for the first four years (1975-1978), with all sectors of the economy becoming run down as the period was characterised by intense political confrontation, fierce power struggles within the *Derg* itself and the Ethio-Somali war.

⁴ It should be noted, however, that during the Italian occupation/aggression, there were small-scale manufacturing producing consumer goods such as soap and textiles (Eshetu, 1995:194-195 and 201).

⁵ About 67 percent of the establishments were fully and partially owned by foreigners (See Getnet 2003).

⁶ Government ownership in the manufacturing sector was more than 90 percent.

At the end of 1978, the Central Planning Supreme Council was set up as an instrument to control and allocate resources. Following its establishment, Six Annual Development Campaign Plans were successively launched, between 1979 and 1984 with the aim of rehabilitating the war-ravaged economy of the country. It should be noted, however, that these were annual programmes, short-term in nature, intended to meet the immediate challenges of food shortages, low capacity utilisation in industry and the like, and could by no means be construed as comprehensive development plans.

In September 1984, the regime issued a comprehensive and long-term development plan, which came to be known as the Ten-Year Perspective Plan, covering the period from 1985 to 1994. The development strategy was the same, import substitution industrialisation. The major difference was that during the socialist regime, the strategy was state-led.

The current Government is pursuing an agricultural development led industrialisation as opposed to the previous regimes. It is believed that priority to agriculture in the short and medium term will create a big domestic market for industry and supply food and raw material to industry and this is anticipated to strengthen the inter-sectoral linkages between agriculture and industry and will lead the economy to the development of industry. The problem, however, is that the urban sector of the economy is somehow ignored and the focus on agriculture has not even emancipated peasants from the havoc of periodic famine.

There have been long years of adverse policies and economic management in which the private sector remained inactive and where the state sector lacked the dynamism required to foster industrial growth. It would therefore be interesting, as an objective of this paper, to establish whether the resource use and learning of the Ethiopian manufacturing industry has made any headway and establish to what extent Ethiopia's industrialisation effort has succeeded or failed in establishing internal and external competitiveness.

The rest of the paper is outlined as follows. The next section deals with conceptualisation of competitiveness. Section 3 discusses the estimation of competitiveness while section 4 attempts to pinpoint what sorts of manufacturing activities Ethiopia should promote, at what pace and what measures to consider. Finally, concluding remarks are set out in section 5.

2. Conceptualising competitiveness: concepts and method of measurement

2.1. Conceptual framework

There is little consensus about the precise meaning of competitiveness, though economists, politicians, and business leaders frequently use it. There is even less consensus about the method of measuring competitiveness. Some authors use the term to describe resource use by different entities such as the firm, industry, state or country. Sustained international competitiveness requires a productivity level and rates of growth equal to or exceeding those of competing countries. Levels and rates of growth of productivity are of paramount importance for an assessment of the manufacturing sector's current and potential competitiveness. Comparison of average productivity levels of different firms within an industry and similar industries in different countries provides relative efficiency levels and, at the end, relative competitiveness. Inefficient firms can hardly compete in international markets even if they have enabling external environment. Hence, productivity measures are the direct venue for measuring competitiveness. However, such an approach cannot reveal information on the cost of productivity improvement. Productivity can be improved through costly incentive measures that could offset the gain obtained through the latter, which could leave unit cost and competitiveness unchanged. Combining production inputs efficiently in the production process is not synonymous to selling products efficiently and increasing market shares (see Salinger, 2001 and Cockburn et al., 1998).

Other authors define competitiveness as a nation's ability to produce and market a product in international trade while earning a level of return to the resources used in production. This level of return to resources is comparable to what these resources could earn in alternative activities (i.e., opportunity cost). This is similar to the domestic resource cost (DRC) concept. The DRC is estimated as the ratio of the economic value of domestic resources (i.e., factors of production) used in production relative to the economic value-added (economic value of outputs minus the economic value of tradable inputs) generated by the production process. The DRC, thus, represents the value of domestic resources spent in order to gain or save a unit of foreign exchange. But as Salinger (2001:10) points out, such a calculation is based on outdated notions: that there are no economies of scale, that technologies everywhere are identical, that products are undifferentiated, that the pool of national factor is fixed, and that skilled or high quality factors are not tradable.

Most authors use the term competitiveness to refer to an advantage of firms or industries vis-à-vis their competitors in the domestic or international markets. For such authors, competitiveness is simply the capacity to sell one's product profitably. To be competitive, a firm must be able to undercut the prices or offer products of better quality than its competitors. At the enterprise or industry level, producers are deemed to be competitive if their unit cost of production is inferior or equal to those of their competitors both in the domestic as well as in the international markets. This is the firm or industry level (microeconomic) use of the term. In this case, the indicator of competitiveness used is the unit cost ratio, defined as total cost divided by the value of output, which in turn equals to output quantity times the ex-factory price. For domestic sales, the ex-factory price is the domestic market price, which is typically higher than the international price of a similar imported product by a margin equal to the nominal rate of protection. For export sales, the ex-factory price is equal to the international price. However, competitiveness estimations at a minimum must be careful to compare comparable goods, as manufacturing diversifies into increasingly differentiated products, which are sold to end consumers via sophisticated marketing campaigns. As well, it requires care to include overhead expenditures (research and development, travel, advertising, customer relations, professional association networking). The shortcoming of such an approach is that it does not take into consideration the selling capability of a firm. A firm may be cost competitive while it does not have the necessary know-how to successfully market and deliver its product. Non-cost determinants of competitiveness are excluded (see Siggel, Ikara, and Nganda, 2000).

Some researchers have extended the meaning of competitiveness to the entire economies. The economy wide competitiveness is measured by the exchange rate, which some call it a dangerous obsession. In aggregate, a country cannot be competitive in all activities as this would lead to currency appreciation until some activities become internationally non-competitive. Exchange rate over-valuation or under-valuation can temporarily affect the competitiveness of all activities, but it will tend to correct itself automatically through a balance of payments mechanism.

Researchers such as Balassa measure competitiveness through outcomes. The outcome of competitiveness is profitable trade. Profitable trade leads to maintaining an increasing market share. Market share is used as a measure of competitiveness. These measures are ex-post measures based on past performance. The best-known market share indicator of competitiveness is the 'revealed comparative advantage' developed by Balassa, which can be put as follows:

$$RCA = \frac{X_k^A / X_k^w}{X_T^A / X_T^w} \quad (1)$$

where RCA = revealed comparative advantage and where A stands for a particular country, k for exported product, T represents total export, w represents world export and X represents the magnitude of export by country A and the world for product k and all goods. RCA greater than one implies a comparative advantage or specialisation of trade in that commodity by that country. By allowing intra-industry trade through the inclusion of imports, the above expression can be transformed to:

$$RC = RCA - \frac{M_k^A / M_k^w}{M_T^A / M_T^w} \quad (2)$$

where RC = revealed competitive advantage and M represents imports from country A or the world of commodity k or all commodities. The revealed competitiveness advantage index as a measure of competitiveness shows how well a country's particular economic sector or industry competes abroad and at home. A positive RC measure demonstrates that country A has a competitive edge in producing and trading commodity k. However, the market share is the result, not the cause of competitiveness. Such an approach leads to no specific policy implication since it does not deal with causes (see Salinger, 2001)

The World Economic Forum (2000) approached competitiveness, through its World Competitiveness Report and African Competitiveness Report, in terms of economy wide business environment. Here, competitiveness is measured through a weighted index that includes different items, namely political and economic stability, openness to trade and investment, legal and institutional enabling environment, financial infrastructure and institutions, human resource development and technology, and economic and social infrastructure. Such a measure, however, does not allow for evaluating single industry or firm since it does not capture industry or firm specific capability differences and since it heavily depends upon subjective judgements.

2.2. Methods of measurement

Though diverse are the measures of competitiveness, unit cost indicator is employed in this paper to determine the competitiveness of the Ethiopian manufacturing

industries. The main reason being, as described above, the theoretical soundness that unit cost is decisive to competitiveness.

Productivity and competitiveness are linked to realising many of the management concepts that affect the human capital necessary for improving productivity. To the extent that one firm manages its materials inventory and flow-through, the organisation of its labour force, technology acquisition, and the supply chain to final consumers more efficiently than another, it will be able to increase its sales per unit factor input compared to other firms. This is increased total factor productivity. If a firm does not make a productive use of its factors and other inputs, it is unlikely that it will reduce costs or generate value-added to such an extent that it will have competitive advantage in production. Though productivity improvement could be the necessary condition to be cost competitive, factor costs and the knowledge to master costs are the relevant elements. Hence, analysing unit cost indicators, the main focus of this section, is of paramount importance in formulating an industrial policy that builds up internationally competitive manufacturing industries.

The unit cost indicator used in this section follows that of Cockburn et-al (1998), Siggel and Ssemogerere (1999) and Siggel, Ikara, and Nganda (2000). Their approach rests upon comparing the cost structure of local firms with those of their competitors to determine their competitiveness. This is in line with the neo-classical firm theory. Firms always drive to maximise profits subject to technological and resource constraints. As long as profitable opportunities exist, firms will increase their production and sales. Making profits and expanding sales require firms to bring the unit cost below market prices (or marginal cost below marginal revenue). Costs are, thus, the fundamental determinants of competitiveness. Competitiveness of local firms is, therefore, defined by a cost advantage over foreign competitors, namely unit cost of local firms should at least be equal to that of their foreign competitors. Symbolically, this can be put as:

$$UC \leq UC_F \quad (3)$$

where F represents the foreign competitor and UC = unit cost, which is total production cost (TC) per physical unit of production. This leads us to:

$$UC = \frac{TC}{Q} \quad (4)$$

where Q = quantity produced. Since firms produce products of different quality, such physical unit comparisons among firms might be unreasonable. As long as consumers value quality through price, equation (2.4) can be transformed into:

$$UC = \frac{TC}{pQ} \quad (5)$$

where p represents market price. Now, unit cost takes a monetary form that allows comparison across firms. Hence, the indicator of competitiveness – the unit cost ratio – is defined as total cost divided by the value of output.

Such a comparison will require information on the cost structure and output of both local firms and their international competitors, which is highly data demanding. One way out from such a difficulty would be to impose the assumption of long-run behaviour of firms. Firm's theory asserts that in the long run, through free entry and exit of firms and the free interplay of market forces, firms are supposed to operate at or near zero profit in order to survive. Employing the same principle, a typical international best practice competitor is assumed to sell at cost, implying that $TC = pQ$. Therefore,

$$UC_F = \frac{TC}{pQ} = 1 \quad (6)$$

Thus, the unit cost of this typical best practice international producer corresponds to the international price. As a result, the indicator of competitiveness will reduce to:

$$UC \leq 1 \quad (7)$$

Such a formulation of the competitiveness indicator will have two advantages. First, the usual difficulty of making inter-firm comparison due to product mix and quality differences will be eliminated. Second, such an indicator will become free of actual comparison with foreign firms, which otherwise would require looking for data on an international competitor.

If $UC < 1$, the firm in question produces at a lower cost than its competitors and is thus more competitive. A unit cost inferior to one indicates that the firm is making profit. Since total cost includes the opportunity cost of capital, a firm may earn a

positive rate of return and still show up as uncompetitive if its rate of return is lower than the lending rate. Competitiveness in this sense, therefore, means that the price covers all costs including the full opportunity cost of capital, and is a long-run analysis.

There are different types of indicators to measure competitiveness. These are indicator of domestic competitiveness, indicator of international competitiveness, and indicator of comparative advantage. Their basic difference mainly rests upon the valuation. While domestic competitiveness denotes the situation of cost advantage under protection, international competitiveness reflects the situation at free trade prices while that of comparative advantage relates to shadow price conditions (competitiveness measured in the absence of price distortions). Competitiveness, domestic and international, is measured in terms of market prices while comparative advantage is measured in terms of shadow prices (economic opportunity costs) net of all price distortions. Domestic competitiveness reflects financial profitability at domestic, protected, distorted prices. International competitiveness is the financial profitability at international output prices. Comparative advantage is economic profitability at shadow prices. In order to measure comparative advantage, one has to replace all prices, output as well as all inputs, by shadow prices.

Symbolically, hence, an indicator of domestic competitiveness can be expressed as:

$$UC_D = \frac{TC}{p_D Q} \leq 1 \quad (8)$$

where D represents domestic competitiveness and p_D represents domestic (protected) prices, which usually refers to ex-factory prices for domestic sales and border prices for exports. The domestic price of output is assumed to depend on border prices of equivalent imports, implicit nominal rate of protection, and monopoly power. In the absence of quantitative restrictions and monopoly power, the domestic output price is affected only by the nominal rate of protection. And, in the absence of the above, nominal rate of protection is normally equal to the tariff levied. When contraband, under-invoicing, and dumping are significant, however, this setting will be jeopardised. In this setting, domestic prices could be less than border prices, local industries no more enjoying the tariff protection.

In the same way, indicator of international competitiveness (or indicator of export advantage) will be:

$$UC_X = \frac{TC}{p_W Q} \leq 1 \quad (9)$$

where X represents indicator of export advantage and p_W is the international price. The comparative advantage criterion is similar:

$$UC_S = \frac{TC_S}{p_S Q} \leq 1 \quad (10)$$

where TC_S is total cost in shadow prices and p_S is the shadow price of output, which is usually equal to the international price adjusted for any distortions in the exchange rate. Total cost at shadow prices is the sum of all cost components adjusted for all price distortions and subsidies. Since competitiveness of firms is determined by its cost at market price, as these are prices that consumers and producers face, rather than shadow prices, and since the estimation of shadow prices is quite a cumbersome exercise, only domestic and international competitiveness indicators are used for our purposes.

We estimate using a four-digit International Standard Industrial Classification (ISIC) manufacturing using Central Statistical Authority (CSA) data. We assume the following for this particular analysis:

- a) Total cost is the difference between gross value of production (GVP) and operating surplus (P), as defined by CSA. Symbolically: $TC = GVP - P$.
- b) In the short-run, fixed costs are assumed to be sunk costs; what matter in the decision making process would be variable costs. It is difficult in the short-run to dispose or expand fixed assets. This assumption implies that the opportunity cost of capital (fixed assets) will be zero, and the cost of capital will only be the sum of the accounting depreciation, rental expenses and interest paid (for working capital or otherwise). This will leave total cost as that of above: $TC = GVP - P$.
- c) In the long run, fixed costs are not sunk costs. Fixed assets are variable. They can be disposed off or can be put in another field of operation in which they can generate better profit. They can be expanded to reach a level that maximises

economies of scale. Hence, fixed assets have an opportunity cost and this cost has to be included in the total cost.

- d) Among the different alternatives of estimating the opportunity cost of capital (rate of return forgone, the current lending rate, the current saving rate, the official discount rate), the official discount rate (r) currently in force, which is 10 percent, will be used.
- e) The fixed assets of a firm or an industry are measured by their net fixed asset value (K), as defined by CSA. This makes the total cost differ from the above by the amount of the opportunity cost of capital or fixed assets. Symbolically, $TC = GVP - P + rK$.

Using these basic assumptions, the indicator of domestic competitiveness for the two scenarios will be the following: -

- a) Short-run Scenario:

$$UC_D = \frac{TC}{p_D Q} = 1 - \frac{P}{GVP} \leq 1 \quad (11)$$

- b) Long-run Scenario:

$$UC_D = \frac{TC}{p_D Q} = 1 + \frac{rK}{GVP} - \frac{P}{GVP} \leq 1 \quad (12)$$

In order to compute international competitiveness, we impose the following additional assumption in addition to the above: -

The cause for the difference between domestic prices and border prices (international prices) is the customs tariff imposed. Hence, the subtraction of the customs tariff (t) in GVP at domestic prices (GVP_d) will give GVP at border prices (GVP_b). Symbolically: $GVP_b = (1-t) GVP_d$.

With this additional assumption, the indicator of international competitiveness for the two scenarios will take the following form:

- a) Short-run Scenario:

$$UC_X = \frac{TC}{p_S Q} = \frac{GVP}{GVP(1-t)} - \frac{P}{GVP} \leq 1 \quad (13)$$

b) Long-run Scenario:

$$UC_x = \frac{TC}{p_s Q} = \frac{GVP - P + rK}{GVP(1-t)} \leq 1 \quad (14)$$

3. Estimating the competitiveness of Ethiopian manufacturing

Indicators of the competitiveness of the Ethiopian manufacturing industry have been computed using the above formulation. The recent three years (1998/99, 1999/00 and 2000/01) survey from CSA have been considered for the estimation. Based on a four-digit ISIC grouping, about 45 manufacturing activities have been identified for the analysis. For each of the manufacturing activities identified, an indicator of domestic competitiveness has been computed using three cases: without the cost of capital, (namely depreciation and the opportunity cost); without the opportunity cost of capital; and with all costs of capital. The first two cases are short-run scenarios in which fixed assets could possibly be considered as sunk costs. In the short-run, it could be managerially admissible to allow production to continue, even if all the costs of capital are not recovered. The third case is the long-run scenario in which it is not advisable to continue production, if all costs are not to be recovered. In this case, shifting to other activities could be considered. The result is summarised in Table 3.1.

Table 3.1: Indicators of domestic competitiveness

INDUSTRIAL GROUP	1998/99			1999/00			2000/01		
	Wocc	Woocc	Wac	Wocc	Woocc	Wac	Wocc	Woocc	Wac
1 Processing and preserving of meat, fruits and vegetables	0.726	0.782	0.839	0.725	0.780	0.834	0.764	0.838	0.917
2 Manufacture of vegetables & animal oils & fats	0.953	1.050	1.182	0.954	1.086	1.293	0.913	1.096	1.313
3 Manufacture of dairy products	0.800	0.969	1.257	0.720	0.856	1.206	0.732	0.821	0.944
4 Manufacture of grain mill products	0.950	0.977	1.014	0.926	0.958	1.005	0.961	1.002	1.057
5 Manufacture of prepared animal feeds	0.877	0.896	0.921	0.919	0.931	0.947	0.916	0.929	0.944
6 Manufacture of bakery products	0.824	0.856	0.891	0.832	0.869	0.919	0.837	0.888	0.946
7 Manufacture of sugar & sugar confectionery	0.479	0.521	0.564	0.545	0.599	0.668	0.450	0.510	0.587
8 Manufacture of macaroni & spaghetti	0.824	0.845	0.869	0.778	0.802	0.832	0.836	0.857	0.882
9 Manufacture of food products n.e.c	0.753	0.817	0.904	0.764	0.812	0.900	0.669	0.835	1.030
10 Distilling, rectifying & blending of spirits	0.699	0.717	0.736	0.813	0.829	0.847	0.784	0.806	0.823
11 Manufacture of wines	0.859	0.871	0.878	0.880	0.974	1.099	0.887	0.952	1.028
12 Manufacture of malt liquors & malt	0.914	0.952	0.997	0.755	0.812	0.886	0.691	0.772	0.864
13 Soft drinks & production of mineral waters	0.886	0.942	0.993	0.922	0.995	1.069	0.918	0.972	1.025
14 Manufacture of tobacco products	0.504	0.516	0.527	0.636	0.646	0.655	0.785	0.804	0.831
15 Spinning, weaving & finishing of textiles	0.984	1.103	1.245	0.977	1.111	1.292	0.960	1.067	1.197
16 Manufacture of cordage, rope, twine & netting	0.829	0.867	0.919	0.846	0.879	0.938	0.981	1.024	1.077
17 Knitting mills	0.814	0.915	1.041	0.846	1.121	1.490	0.992	1.155	1.361
18 Manufacture of wearing apparel except fur apparel	1.040	1.116	1.221	1.005	1.079	1.204	1.051	1.116	1.208
19 Tanning & dressing of leather, luggage & handbags	0.833	0.868	0.909	0.927	0.988	1.075	0.954	0.992	1.039
20 Manufacture of footwear	0.865	0.922	0.986	0.891	0.964	1.055	0.890	1.010	1.138
21 Wood and cork, except furniture	0.822	0.838	0.855	0.832	0.851	0.864	0.757	0.769	0.780
22 Manufacture of paper & paper products	0.876	0.921	0.975	0.815	0.847	0.896	0.832	0.865	0.903
23 Publishing and printing services	0.717	0.756	0.797	0.700	0.737	0.777	0.716	0.750	0.789
24 Basic chemicals	1.112	1.489	1.951	0.796	1.216	1.865	0.773	0.955	1.182
25 Manufacture of paints, varnishes and mastics	0.793	0.825	0.861	0.800	0.824	0.868	0.814	0.834	0.857
26 Pharmaceuticals	0.861	1.001	1.160	0.739	0.892	1.085	0.880	1.021	1.181
27 Soap, detergents, perfumes and toilet preparations	0.913	0.951	1.004	0.855	0.879	0.922	0.854	0.881	0.912
28 Manufacture of chemical products n.e.c.	0.794	0.837	0.891	0.809	0.884	0.995	0.921	0.967	1.026
29 Manufacture of rubber products	0.770	0.855	0.953	0.754	0.819	0.911	0.714	0.774	0.845
30 Manufacture of plastic products	0.793	0.853	0.924	0.835	0.900	0.992	0.797	0.856	0.925
31 Manufacture of glass and glass products	0.624	0.691	0.765	0.754	0.931	1.048	0.686	0.770	0.865
32 Manufacture of cement, lime and plaster	0.749	0.789	0.832	0.701	0.730	0.796	0.721	0.748	0.783
33 Manufacture of articles of concrete, cement & plaster	0.799	0.882	0.932	0.809	0.860	0.910	0.848	0.881	0.914
34 Manufacture of non-metallic mineral products n.e.c.	0.879	1.120	1.391	0.856	1.070	1.342	0.936	1.172	1.437
35 Manufacture of basic iron and steel	0.885	0.903	0.922	0.844	0.867	0.894	0.916	0.941	0.973
36 Structural metal products, tanks and containers	0.907	1.014	1.139	0.890	0.983	1.114	0.887	0.951	1.037
37 Manufacture of cutlery, hand tools and hardware	0.920	0.966	1.022	0.962	1.009	1.075	0.922	0.968	1.028
38 Manufacture of other fabricated metal products	-	-	-	0.817	0.983	1.217	0.864	0.990	1.147
39 Manufacture of ovens, furnaces and furnace burners	0.887	0.910	0.934	0.831	0.861	0.879	0.900	0.904	0.909
40 Manufacture of other general purpose machinery	0.918	-	-	0.839	0.0	0.851	-	-	-
41 Machinery for food & beverage processing	0.844	0.928	1.036	0.851	1.063	1.395	0.741	0.846	0.982
42 Accumulators, primary cells & batteries	1.513	1.544	1.594	0.914	0.0	0.974	0.914	0.940	0.967
43 Manufacture of bodies for motor vehicles	0.903	0.911	0.920	0.806	0.816	0.828	0.848	0.863	0.881
44 Parts and accessories for motor vehicles	0.262	0.396	0.519	0.341	0.478	0.601	0.757	0.918	1.077
45 Manufacture of furniture; manufacturing n.e.c	0.859	0.925	1.008	0.854	0.909	0.997	0.866	0.929	1.013

Source: own computation from CSA survey

Note: Wocc: competitiveness without considering all costs of capital.

Woocc: competitiveness without taking into consideration the opportunity cost of capital.

Wac: competitiveness considering all costs of capital, i.e. depreciation and opportunity cost of capital, about ten percent of the net fixed asset.

In the analysis, a value greater than one indicates that these particular sectors are financially unprofitable, implying that they sell their products below their unit costs of production. As shown in Table 3.1, there are sectors, which are not financially profitable even with the current tariff barriers Ethiopia imposes on imported products. As per the computations made, about half of the four-digit manufacturing activities were unable to cover all costs of production in 2000/01, including the cost of capital. This implies that about half of the Ethiopian manufacturing sector is not competitive even in the current protected and distorted domestic market. Surprisingly, the majority of these belong to sub-sectors in which one would expect Ethiopia to have a clear competitive advantage in the global market, namely food, beverages, textiles and leather sub-sectors. Interestingly, all the four-digit manufacturing activities under the textiles and leather sub-sectors prove to be uncompetitive in the domestic market. All except the manufacture of wearing apparels become domestically competitive if we ignore the cost of capital. The manufacture of wearing apparels is not competitive even excluding the cost of capital for the whole period under investigation. It is interesting to note, here, that the number of four-digit manufacturing activities that are domestically uncompetitive even without considering the cost of capital has dropped from three in 1998/99 to only one in 2000/01. The significance of contraband, dumping, and under-invoicing could be the reason behind such a situation, for this would nullify any advantage the protection of these sub-sectors would otherwise provide.

Indicators of international competitiveness have been also computed using the above three cases. The result is summarised in Table 3.2. Here, too, a figure below one indicates that the particular sector in question will have a cost advantage under free trade prices, making it competitive in the international market. Based on calculations made, sub-sectors with such a cost advantage at free trade prices were only four in 2000/01, namely the manufactures of sugar, wood and cork, publishing and printing services, and plastics. In 1999/00, the number of manufacturing activities with cost advantage at border prices were eight, double that of 2000/01. These manufacturing activities, as shown in Table 3.2, were sugar, tobacco products, publishing and printing services, other chemical products, plastic, glass, basic iron and steel and parts, and accessories of motor vehicles.

Three clear facts stand out from Table 3.2. First, local-resource-based manufacturing activities did not reveal any tendency of being internationally competitive, with the exception of the manufacture of sugar. Interestingly, import-based manufacturing activities like the manufacture of plastics revealed consistent cost advantage at border prices. Second, the number of the four-digit manufacturing activities that had demonstrated a sign of being internationally competitive were dwindling since 1998/99 – from eight in 1998/99 to five in 1999/00 and four in 2000/01. Third, the likelihood that Ethiopian manufactured products would be internationally competitive, even considering the cost of capital as sunk, is limited. The cost of capital did not significantly influence the competitiveness of manufacturing activities, though it is an important factor in the production process.

Table 3.2: Indicators of international competitiveness

INDUSTRIAL GROUP	1998/99			1999/00			2000/01		
	wocc	woocc	Wac	wocc	woocc	wac	Wocc	woocc	Wac
1 Processing and preserving of meat, fruits and vegetables	0.976	1.032	1.049	0.975	1.030	1.043	1.014	1.088	1.146
2 Manufacture of vegetables & animal oils & fats	1.620	1.716	1.971	1.620	1.753	2.155	1.580	1.763	2.188
3 Manufacture of dairy products	1.050	1.219	1.571	0.970	1.106	1.508	0.982	1.071	1.180
4 Manufacture of grain mill products	1.061	1.089	1.127	1.037	1.069	1.116	1.072	1.113	1.174
5 Manufacture of prepared animal feeds	1.127	1.146	1.151	1.169	1.181	1.184	1.166	1.179	1.180
6 Manufacture of bakery products	1.491	1.522	1.486	1.499	1.536	1.531	1.504	1.554	1.577
7 Manufacture of sugar & sugar confectionery	0.531	0.574	0.593	0.597	0.652	0.703	0.502	0.562	0.618
8 Manufacture of macaroni & spaghetti	1.491	1.511	1.449	1.445	1.468	1.386	1.502	1.524	1.469
9 Manufacture of food products n.e.c	1.420	1.484	1.506	1.431	1.479	1.500	1.335	1.502	1.716
10 Distilling, rectifying & blending of spirits	1.366	1.384	1.227	1.480	1.496	1.412	1.451	1.473	1.372
11 Manufacture of wines	1.526	1.537	1.464	1.547	1.641	1.831	1.554	1.618	1.713
12 Manufacture of malt liquors & malt	1.580	1.619	1.662	1.422	1.479	1.477	1.358	1.438	1.440
13 Soft drinks & production of mineral waters	1.552	1.608	1.655	1.589	1.662	1.781	1.585	1.639	1.708
14 Manufacture of tobacco products	0.933	0.945	0.753	1.065	1.075	0.936	1.213	1.232	1.187
15 Spinning, weaving & finishing of textiles	1.095	1.214	1.383	1.088	1.222	1.436	1.071	1.179	1.330
16 Manufacture of cordage, rope, twine & netting	1.079	1.117	1.149	1.096	1.129	1.172	1.231	1.274	1.346
17 Knitting mills	1.480	1.582	1.735	1.513	1.787	2.483	1.659	1.821	2.268
18 Manufacture of wearing apparel except fur apparel	1.707	1.783	2.036	1.671	1.746	2.006	1.718	1.783	2.013
19 Tanning & dressing of leather, luggage & handbags	1.261	1.297	1.298	1.356	1.416	1.536	1.382	1.420	1.485
20 Manufacture of footwear	1.531	1.589	1.643	1.557	1.630	1.759	1.557	1.677	1.896
21 Wood and cork, except furniture	0.998	1.015	1.005	1.008	1.027	1.017	0.934	0.946	0.918
22 Manufacture of paper & paper products	1.052	1.098	1.148	0.991	1.023	1.054	1.008	1.042	1.062
23 Publishing and printing services	0.770	0.809	0.839	0.753	0.790	0.818	0.769	0.803	0.830
24 Basic chemicals	1.223	1.600	2.168	0.907	1.327	2.072	0.885	1.066	1.313
25 Manufacture of paints, varnishes and mastics	1.222	1.253	1.230	1.229	1.252	1.240	1.243	1.262	1.225
26 Pharmaceuticals	0.913	1.054	1.221	0.792	0.944	1.142	0.933	1.073	1.243
27 Soap, detergents, perfumes and toilet preparations	1.341	1.380	1.435	1.283	1.308	1.317	1.283	1.309	1.303
28 Manufacture of chemical products n.e.c.	0.905	0.948	0.990	0.920	0.995	1.105	1.032	1.078	1.141
29 Manufacture of rubber products	1.199	1.283	1.361	1.183	1.248	1.301	1.143	1.203	1.207
30 Manufacture of plastic products	0.846	0.906	0.972	0.888	0.953	1.045	0.850	0.909	0.974
31 Manufacture of glass and glass products	0.874	0.941	0.957	1.004	1.181	1.311	0.936	1.020	1.081
32 Manufacture of cement, lime and plaster	1.416	1.456	1.386	1.368	1.397	1.326	1.387	1.414	1.304
33 Manufacture of articles of concrete, cement & plaster	1.466	1.549	1.553	1.476	1.526	1.516	1.514	1.548	1.523
34 Manufacture of non-metallic mineral products n.e.c.	1.545	1.786	2.319	1.523	1.737	2.237	1.602	1.839	2.394
35 Manufacture of basic iron and steel	0.938	0.956	0.971	0.897	0.919	0.941	0.968	0.994	1.024
36 Structural metal products, tanks and containers	1.019	1.125	1.265	1.001	1.095	1.238	0.998	1.062	1.153
37 Manufacture of cutlery, hand tools and hardware	1.348	1.395	1.460	1.390	1.438	1.535	1.350	1.397	1.469
38 Manufacture of other fabricated metal products	-	-	-	1.067	1.233	1.521	1.114	1.240	1.434
39 Manufacture of ovens, furnaces and burners	1.137	1.160	1.167	1.081	1.111	1.099	1.150	1.154	1.136
40 Manufacture of other general purpose machinery	0.971	-	-	0.892	-	0.896	-	-	-
41 Machinery for food & beverage processing	0.897	0.981	1.090	0.903	1.116	1.468	0.794	0.899	1.034
42 Accumulators, primary cells & batteries	1.763	1.794	1.992	1.164	-	1.218	1.164	1.190	1.209
43 Manufacture of bodies for motor vehicles	1.332	1.339	1.314	1.235	1.245	1.183	1.277	1.292	1.258
44 Parts and accessories for motor vehicles	0.512	0.646	0.648	0.591	0.728	0.751	1.007	1.168	1.346
45 Manufacture of furniture; manufacturing n.e.c	1.288	1.353	1.440	1.283	1.337	1.424	1.294	1.358	1.447

Source: own computation from CSA survey

4. The way ahead for competitive industrialisation

Industrialisation is imperative given the fluctuating and persistently deteriorating prices of primary products vis-à-vis industrial products on world markets and the fixed nature of land and its low productivity with population pressure. In nearly all economies, the manufacturing industry has been the critical agent of the structural transformation that marks the transition from a primitive low productivity, low-income state to one that is dynamic, sustained, and diversified. The history and experience of developed countries and some emerging economies in Asia show clearly that the process of change from a low income, low-productivity economy based on traditional agriculture to one utilizing highly productive modern technologies nearly always requires a sustained period of manufacturing industrial expansion.

Competitiveness is the way to face the challenges and to grasp the opportunities provided by globalisation. Given the Ethiopian and the current globalisation context, the need is not simply for manufacturing industrial expansion but also the creation of an enabling environment where the sector can move by its own dynamics in the long run and an immediate intervention by the government to promote competitive enterprises in the short run. Identifying firms which have competitive advantage is, therefore, crucial for manufacturing policy, which facilitates selective intervention along with setting up the basic enabling environment. Thus, we envisaged two ways of Government intervention: selective (immediate) and neutral (long term).

4.1. Selective (immediate) intervention

In the context of resource limitation and other constraints where the Government cannot intervene in all manufacturing activities, there is a need for selective intervention in order to bring about significant change in the structure of the industrial sector and increase its role in the economy. This does not mean direct intervention in terms of public investment in the manufacturing activities. It rather means adopting a preferential policy that supports manufacturing activities that have high level competitiveness capacity.

In order to be selective, it is prudent to seriously consider such factors as contribution to the economy, factor and raw material base, resource use efficiency, and competitive

advantage. In this study an attempt is made to develop composite index criteria for selecting such industrial activities for Ethiopia as a priority to commit its limited resources and effort. The index considers the following important elements for the selection:

i. Contribution to GDP, employment and exports: The Government's effort in bringing about industrialisation is believed to ultimately boost the contribution of the sector for the gross domestic product, employment, and exports of the country. And, in essence, economic integration should benefit the manufacturing sector by helping promote its performance. Therefore, when selecting manufacturing activities for strong intervention, contribution of the particular activity for industrial GDP, employment creation, and exports has to be seriously considered. If the contribution of a particular manufacturing activity is insignificant, the growth of this particular manufacturing activity does not influence the performance of the sector as a whole. Support to such activities or sub-sectors thus will lead the economy nowhere.

ii. Factor intensity (resource base intensity): The relative abundance of factor resources is quite a relevant guide for selection. Competitiveness is an issue of cost advantage and the latter highly depends on factor prices. Price is a reflection of scarcity and abundance. Capital is costly since it is a scarce factor of production and labour is cheap, being an abundant factor of production in countries like Ethiopia. Factor intensity, measured by capital-labour ratio, will, hence, be a relevant guide for selection. If a particular manufacturing activity happens to be more capital intensive, it is away from the resource base of the country and its chance of enjoying cost advantage will be low. The implication is that the chance of such a manufacturing activity to be internationally competitive will be minimal. Hence, Government efforts and resources should not be directed to such manufacturing activities at least in the short run.

iii. Import-intensity: The source of raw material, whether it is locally based or imported, influences the cost of raw material, which in turn determines the price of the product. If the raw material of a particular manufacturing activity is locally based, transport and handling costs will be lower than otherwise, the cost of stock management will be less, supply will not be constrained by the availability of foreign exchange and ex-ante inspection will be possible. All these could reduce the cost of raw material of a particular industry, while further reducing the price of the new product, leading to cost advantage or increase in profit. The contrary will hold true if raw material is imported. Hence, the extent of import intensity, defined by the ratio of imported raw material to the total raw material consumed, could influence the

competitiveness of enterprises and, as such, becomes a relevant guiding principle for selecting manufacturing activities in which Government should intervene.

iv. Productivity: As already stated, factor intensity and import intensity in relation to resource base would affect the success of a particular manufacturing activity only in as long as productivity gains could not compensate the loss this could entail. Hence, the extent of productivity gains could count more to competitiveness than factor or import intensities. Inefficient firms can hardly compete in international markets even if they have an enabling external environment. Productivity, measured by total factor productivity has, thus, to be considered as one of the basic guiding principles in selecting sectors in which Government has to commit its effort and resources to bring rapid changes in the performance of the manufacturing sector.

v. Domestic competitiveness: Productivity can be improved through costly incentive measures that could offset the gains obtained through the latter, leaving unit cost and competitiveness unchanged. Combining production inputs efficiently in the production process is not synonymous to selling products efficiently and increasing market share. To be competitive, a firm must be able to undercut the prices or offer products of better quality than its competitors. The extent of domestic competitiveness could be and might serve as a sign of good performance of a particular manufacturing activity, at least at the protected and distorted domestic market. This could indicate that, with some experience and learning by doing, the chance for that particular manufacturing activity to be internationally competitive is not far away. Hence, domestic competitiveness could be one of the yardsticks for selecting manufacturing activities for strong intervention by the Government.

vi. International competitiveness: More important for the Government to select sectors or sub-sectors for intervention would be cost advantage at border prices. A manufacturing activity that reveals cost advantage at border prices is, at the same time, capable of penetrating international markets with a minimum extra effort. Such a manufacturing activity has the basic ingredient to be competitive in the international market. Cost advantage, hence, international competitiveness, as defined above, is considered as a good yardstick for the Government to select manufacturing activities

in which it will devote much of its effort and resources. These six factors and two others have been used as the basis for the score.⁷

Each factor is assumed to have equal weight. The score is based on the number of the four-digit manufacturing activities treated in this section. About 43 four-digit manufacturing activities, for which information is available consistently for all factors, have been considered for selection of intervention. A particular manufacturing activity that ranks first for a particular factor will score 43 for the same and the one that ranks last will score one. The sum of these scores (and the average score) is the decision point for the selection of intervention.

Information for these factors are collected is for (1998/99, 1999/00 and 2000/01) for which we found recent data). The average result of these three years is used for comparison among the four-digit manufacturing activities, not to be unnecessarily influenced by outliers (mild or extreme) of a particular year for reasons, which could be irregular. The data source is the "Report on Large and Medium Scale Manufacturing and Electricity Industries Survey" of CSA.

Based on available resources to provide special extension services to the manufacturing sector, Government may choose the manufacturing activities with the highest average scores for intervention. The manufacturing activities with the highest average scores, by implication, are relatively more resource based, efficient in resource use, and more competitive than others. The score for each factor and the average score for the 43 four-digit manufacturing activities are reported in Table 4.1.

⁷ Namely: (i) Contribution to industrial GDP, measured by the share of the value of the particular manufacturing activity in total industrial GDP; (ii) Contribution to employment, measured by the share of the particular manufacturing activity in total industrial employment; (iii) Contribution to export, measured by the share of the particular manufacturing activity in total industrial exports; (iv) Factor intensity, measured by the ratio of net fixed assets to wages and salaries of the particular manufacturing activity; (v) Import intensity, measured by the ratio of imported raw materials consumed in the total raw materials consumed by a particular manufacturing activity; (vi) Total factor productivity, measured by the ratio of value-added at factor cost at the national accounts concept to the combined factor inputs, each weighted by their respective income share in the particular manufacturing activity; (vii) indicator of domestic competitiveness (IDC), measured by the ratio of total costs of the particular manufacturing activity to gross value of production of the same at domestic prices; and (viii) international competitiveness indicator (ICI), measured by the ratio of total costs of the particular manufacturing activity to gross value of production of the same at border prices.

Table 4.1: Factor scores and average scores for four-digit manufacturing activities

Manufacturing Activity	Contr. GDP	Contr. employ.	Contr. export	Factor Intensity	Import intensity	TFP	IDC	ICI	Average Score
Production and preserving of meat, fruits and vegetables	35	33	36	20	36	24	34	35	32
Manufacture of vegetables & animal oils & fats	15	26	33	2	43	2	4	3	16
Manufacture of dairy products	10	8	25	1	38	4	10	18	14
Manufacture of grain mill products	29	34	28	14	32	8	15	31	24
Manufacture of prepared animal feeds	4	6	25	41	40	38	24	30	26
Manufacture of bakery products	32	36	25	24	27	23	27	10	26
Manufacture of sugar & sugar confectionery	43	42	42	12	34	35	43	43	37
Manufacture of macaroni & spaghetti	21	9	25	22	42	32	36	17	26
Manufacture of food products n.e.c	19	16	40	6	39	9	23	9	20
Distilling, rectifying & blending of spirits	20	15	25	39	30	41	39	22	29
Manufacture of wines	11	13	32	34	29	36	18	8	23
Manufacture of malt liquors & malt	42	32	35	10	19	13	29	12	24
Soft drinks & production of mineral waters	34	39	37	26	22	17	14	7	25
Manufacture of tobacco products	37	17	25	33	10	43	42	40	31
Spinning, weaving & finishing of textiles	39	43	41	18	28	18	5	19	26
Manufacture of cordage, rope, twine & netting	17	31	25	38	13	34	19	26	25
Knitting mills	2	4	25	7	12	7	3	2	8
Manufacture of wearing apparel except fur apparel	14	38	38	32	35	1	6	4	21
Tanning & dressing of leather, luggage & handbags	36	37	43	27	33	19	16	15	28
Manufacture of footwear	30	35	34	16	23	10	12	6	21
Wood and cork, except furniture	16	21	25	43	17	42	37	38	30
Manufacture of paper & paper products	25	25	25	30	9	26	26	34	25
Publishing and printing services	38	41	27	37	20	37	40	42	35
Basic chemicals	12	20	25	4	24	6	1	5	12
Manufacture of paints, varnishes and mastics	23	12	25	15	15	28	35	25	22
Pharmaceuticals, medicinal & botanical products	24	19	26	3	8	5	8	28	15
Soap, detergents, perfumes and toilet preparations	26	24	25	17	11	20	22	20	21
Manufacture of chemical product n.e.c.	7	5	25	13	6	13	20	36	16
Manufacture of rubber products	33	18	25	9	2	15	31	23	20
Manufacture of plastic products	31	29	25	11	4	11	21	37	21
Manufacture of glass and glass products	13	11	25	23	31	22	32	33	24
Manufacture of cement, lime and plaster	41	28	25	21	26	31	38	21	29
Manufacture of articles of concrete, cement & plaster	22	30	30	36	41	33	28	11	29
Manufacture of non-metallic mineral product n.e.c.	18	27	29	5	37	3	2	1	15
Manufacture of basic iron and steel	28	22	25	29	3	29	25	39	25
Structural metal products, tanks, and containers	9	14	25	25	16	16	11	27	18
Manufacture of cutlery, hand tools and hardware	8	10	25	35	7	27	13	13	17
Manufacture of ovens, furnaces and furnace burners	2	3	25	42	14	40	30	32	24
Machinery for food & beverage processing	5	7	31	19	21	12	9	29	17
Accumulators, primary cells & batteries	1	1	25	40	1	30	7	14	15
Manufacture of bodies for motor vehicles	40	23	39	28	5	39	33	24	29
Parts and accessories for motor vehicles and their engines	6	2	25	8	18	21	41	41	20
Manufacture of furniture; manufacturing n.e.c	27	40	25	31	25	25	17	16	26

Source: own computation from CSA survey

As clearly exhibited in the table, a little more than half (25 four digit ISIC manufacturing activities) scored more than the average. The highest scoring manufacturing activities, however, are very few. This shows that the existing actual competitiveness capacity of the sector is not that much dependable. If we take firms whose score are greater or equal to 30, we have only five manufacturing activities, namely: production, processing, and preserving of meat, fruits and vegetables; manufacture of sugar and sugar confectionery; manufacture of tobacco products; manufacture of wood and products of wood, except furniture; and publishing and printing services. This implies that these sectors are relatively more significant contributors to the Ethiopian manufacturing sector given the existing situation.

This is not, of course, in line with what the Government propagates with regard to manufacturing sector where the focus is mainly on resource-based theory. Although our result does not refute the focus on resource based manufacturing activities, it suggests that all resource based activities may not necessarily be competitive. Non-resource based firms can also be competitive through improved productivity and high learning rate. Thus, the Government has to consider this composite index for its immediate intervention in the sector.

It should be noted, however, that this does not mean Government shall neglect other sectors whose actual competitiveness capacity is limited. If the Government provides all the necessary supports and engages the private sector in real partnership, the ground will be levelled for different manufacturing activities to be mushrooming. The Government should, therefore, remove the constraints that the manufacturing sector faces in order to create the enabling environment, which could bring sustained and competitive manufacturing sector, a point to which we shall turn now.

4.2. Neutral (long term) intervention

As we have seen in the preceding sections, the capacity of the manufacturing industry to be competitive at the global market is very limited. The few industries with this capacity are not even those one would expect Ethiopia have a clear competitive advantage (resource base). Most activities, which are labour intensive and resource based, are found to be not competitive. This may not be surprising given the Ethiopian context. As mentioned in the introductory note, about 67 percent of the establishments were fully and partially owned by foreigners and there was not much engagement by local people in the manufacturing industry. Local investors were largely involved in trade and housing. This was further worsened by the military regime where

private investment was simply crowded out by policy prescription. As a result, the Ethiopian manufacturing industries do not have much local investor who had accumulated experiences in many aspects. The ground is not still levelled for local investors in the manufacturing sector to be up to the expectation. We have still a large private sector participated in trade and distributive sector.

As noted earlier, in nearly all economies, the manufacturing industry has been the critical agent of structural transformation that marks the transition from a primitive low productivity, low-income state to one that is dynamic, sustained, and diversified. This sector has been, however, engulfed in diverse and immense constraints for extended periods. Constraints affecting the manufacturing sector may be broadly grouped into infrastructure, technology, finance, Government policy, inefficient bureaucracy and poor private-public dialogue.

Thus, the Government has to do a lot in terms of creating an enabling environment in order to promote investment in manufacturing and to strengthen the competitiveness capacity of the sector. If we consider the criteria used by the International Institute for Management Development (IMD) in its World Competitiveness Yearbook 2003 to select the competitive economy in the world, the central focus was the Government. The four criteria that are used in 2003 were measures of economic performance, Government efficiency, business efficiency and infrastructure. Among the four, two (Government efficiency and infrastructure) are directly related with the Government and the other two are not also independent of the Government. The Government has, therefore, a central role in making the manufacturing sector competitive and has to involve itself in alleviating and removing all the constraints and engage itself with structured dialogue with private sector to promote investment.

4.2.1. The role of the government

The main focus with regard to the role of the Government in enhancing competitive manufacturing sector lies on providing the legislative framework, efficient infrastructure, skilled manpower, and stable environment for business.

Providing legislative framework

The Government should provide a clear and predictable legal framework for businesses. Regulations should be administered in an open and transparent system, and applied fairly to all parties. The Government has to make it clear to businesses

that it deals with them solely on the merits of their case. There is no favoured treatment for private companies or for Government/political party-linked companies for that matter. Policies should be guided by the principle that it should support the private sector as the engine of growth and ensures that the macro-environment is stable. A lot remains to be done to provide a legislative framework like this one.

Investing in infrastructure and manpower

The Government has to invest in infrastructure and manpower, aware of the fact that these are the areas in which the private sector is likely to under-invest. Public investment in hard and soft infrastructure facilitates the private sector to come in. It has a strong crowding in effect.

As it has been evidenced by the East Asian economies, the role of Government investment in human capital is the kernel of competitiveness. In order to build a successful competitive economy, there is a need to develop a workforce with capabilities in business, technology, innovation, production and services, and international market development. The Government has to ensure that the education and training system is geared towards the needs of the economy, tailored to what is required, with a strong emphasis on providing technical and professional manpower. The Government has also commit itself in establishing perhaps sector-specific training institute to provide tailored training for competitive manufacturing activities and establish a development centre that provides entrepreneurship and business management skill at federal and regional level. These human resource strategies call for a special policy for manpower development and perhaps a special agency to accomplish.

Similarly, an efficient infrastructure lowers business costs and makes it attractive for investors. Efficient infrastructure significantly lowers the transaction cost and improves the competitiveness of the manufacturing sector. Despite the Government efforts to improve the country's road network, Ethiopia's road transport infrastructure is still weak. The percentage of paved roads for the year 1996 is only 15 percent and it is by far below from other African countries. The normalised road index for the same year was 55, which is considerably far away from the average.²⁸

²⁸ The normalised road index is the total length of roads in a country compared with the expected length of roads, where the expectation is conditioned on population, population density, per capita income, etc. A value of 100 is normal; less is below average. This is based on the World Bank, World Development Indicators, 1998, table 5.9.

Telecommunication services, the other major infrastructure, is wholly operated and owned by the Government. This might be one of the reasons that makes the country one of the lowest telephone densities in the world. Telephone mainlines per 1000 people is only 3.²⁹

Facilitating business

Government is always expected to play through providing a pro-business environment for the private sector. This includes having sound macro-economic policies, good soft and hard infrastructure, and a developmental mindset. The Government has to exercise also greater flexibility in the administration of rules and regulations. It should facilitate conditions to do businesses, including foreign investors wishing to come to Ethiopia, through various promotional agencies. We need to have agencies entrusted with this responsibility in each important and strategic sector. One of the secrets of the success of the East Asian countries is the role of the Government through promotional agencies.

Further more, the Government has to develop a specific export/manufacturing zone with special package of fiscal incentives, technology and other like preferential rating on public utility services, particularly electricity and direct provision, such as land, buildings, and finance.

4.2.2. Addressing market difficulties

As the 1995/96 CSA survey on manufacturing industries underlines, absence of market is the most serious problem facing manufacturing industries, both small scale and large and medium industries, to operate at full capacity. Out of 2731 small-scale industries surveyed, 1471 (54 percent) identified absence of market as the major constraint for not being operational at full capacity. Out of 630 large and medium industries surveyed, 269 (43 percent) identified absence of market as the major constraint for not being operational at full capacity. The average capacity utilisation for manufacturing industries was only 49 percent in 2000/01.³⁰ The main reason for market difficulties could be, among others, lack of effective domestic demand and dumping.

²⁹ This is 48 for Botswana, 50 for Egypt, 45 for Morocco, 15 for Zimbabwe and 162 for Mauritius (See World Bank, World Development Indicators 1998, table 5.10).

³⁰ See BACTECT, 2003:100

Creating effective domestic demand

Effective domestic demand is a crucial element in boosting competitiveness. Specifically, the nature and quality of demand is much more important than the size. Particular quality demands for manufacturing output are believed to pressurise producers to give more attention to the quality of the product and after sales services. In this process, manufacturing industries will be challenged to be innovative, improve their productivity and increase their learning rate and hence gain competitive advantage. For this, we need effective local markets, which are strong enough to put pressure on producers to innovate, improve production, to invest more, and to be more efficient.

The main issue here is how we are going to build this kind of local market in our economy. The population of Ethiopia is approximately 70 million, growing at a rate of 2.7% per annum (1961-2003), and real gross domestic product at factor cost grew at 2.6% per annum for the same period, which led to a negative per capita income growth (-0.1%).³¹ About 85 percent of the population lives in rural areas and are employed in agriculture, of which nearly half produce below subsistence level of output.³² This shows a very limited actual market which has very limited role in supporting the competitiveness of the manufacturing sector. The question is how to create an effective domestic demand/market.

From the preceding paragraph, we can observe that the potential market is in the rural area. Given the context in the preceding paragraph and high level of poverty in the rural area, the success of building effective local demand critically depends on the treatment of agriculture and the rural sector. In fact, development processes, hence building an effective local market, may be characterised by trying to reduce relative importance of rural and agricultural sector in GDP and employment, and moving workers and families into non-agricultural (industrial) sectors and urban areas. Development, both from theoretical and empirical evidence, is conceived as a social transformation (from rural to urban) and economic transformation (from agriculture to non-agriculture, i.e., manufacturing and then service). The transformation inherent in the development process is agricultural transformation, which, in turn, implies a decline in its share in total output and employment with a simultaneous rise in the share of non-agricultural sector. Focusing/investing in agriculture must, therefore, be

³¹ Annual growth rates were estimated by regressing the natural logarithmic values of the variable against time. Source for the data: EEA/EEPRI Statistical Data Base, 2003.

³² MoFED, 2002.

in the context of reducing its significance in the economy and simultaneous rise in the importance of non-agriculture. Building the local market involves improving and diversifying the livelihoods of the rural population in the context of transforming the sector. In light of this, the current overall development strategy and agricultural policy need to be revisited.³³

Preventing dumping

Most imported items originate, nowadays, from those countries that undertake extensive export promotion measures, namely Asian countries (such as China, Korea, Singapore, Indonesia, and Taiwan) and the Middle East. In these countries, many exported items, mainly finished products, are produced in export processing and/or industrial zones where most of the infrastructure, utilities, and work premises are covered or provided by the Government at concessionary prices; bureaucratic hassle and transaction costs are minimal; the financial environment is friendly; there is extensive technical support in terms of technology selection and dissemination, quality standards, skill upgrading, and market information; duties and taxes are either minimal or absent altogether; and many leverages are given to those firms aiming at the export market. There is also cost subsidy to promote export. It is not surprising, therefore, if, with all these concessions and privileges, an imported item is cheaper in Addis Ababa. To look at how cheap and excessively abundant food items such as tea, edible oil, wearing apparels, footwear, and electronics are in the streets of Addis Ababa requires little effort. Domestic industries producing these and other similar items including food products (tea, edible oil), detergents, and wheat flour are operating below capacity. The scale of dumping seems to be increasing making the condition worse for domestic manufacturers at the same pace. The situation does not seem to have captured the attention of the Federal Government as well as the City Governments in that the level of response to take remedial measures to mitigate the scale of dumping is yet to match the gravity of the problem.

4.2.3. Public-private partnership

Government may lack proper understanding, technical know-how and management capability to deeply know the problems of manufacturing industries at sectoral and sub sectors level. Thus, it always has difficulty in addressing factors that drive the competitiveness of manufacturing. The recognition of the private sector as a key actor

³³ For detail discussion see Getnet 2005a and 2005b.

in the country's economic development and hence, institutionalise the participation of the private sector in the policy formulation process at different levels and collaboration in different investment venture, allows the country to join the two key actors together to have consensus on policy issues, shared vision and pool resources.

The importance of instituting public-private partnership in which the private sector can present its concerns, views, and problems to public authorities is well recognized. Ensuring that the views of the private sector are, always and as a rule, heard at every stage of policy formulation and implementation on a regularly basis is considered vital in realizing growth objectives. This is so because consultative mechanisms, among other things, help:

- a) Enhance the flow of information amongst Government, business, and civil society.
- b) Engender a sense of common ownership over reform strategies among stakeholders.
- c) Conserve resources through pooling technical expertise and the sharing of costs.
- d) Generate trust and social capital, which in turn lower the transaction costs of doing business and economic governance.
- e) Facilitate the ease of the free movement of labour and capital between and among regions.

Although there is a good signal of Government's intention to engage with the private sector in the spirit of real partnership, a formal private-public dialogue mechanism of the nature outlined above is absent in Ethiopia. The usual experience is that when there is a conference organised by the private sector, the participation of Government representatives is on invitation. By the same token, when the Government organised conferences the participation of private sector is on invitation. This kind of process may lead the Government to perceive conferences organised by the private sector as a private-sector affairs and private sector may also think conferences organised by the Government as a political affairs. The tone of both kinds of conferences, as observed in the past few years, is not one of partnership. In fact, there was a tendency for the private sector to present lists of complaints to the Government, and for Government, in response, to defend its positions.

A hard fact, which both actors have to accept, is the manufacturing sector of Ethiopia is not in a position to afford an adversarial relationship between the Government and private sector. Experiences of newly industrialised countries and some successful

countries in Africa explicitly showed that public-private partnership is the most important factor to boost the development of the economy.

5. Conclusion

As observed above, the Ethiopian manufacturing sector is not performing well in all aspect of its operations. Its contributions to GDP, exports, employment, growth in output have been very limited. Domestic and international competitiveness and import intensity of the sector are also quite disappointing and deteriorating.

The Ethiopian experience shows no encouraging signs in industrialization and competitiveness despite a relative early entry as compared to other African countries. Changing the disappointing state of the Ethiopian manufacturing industry requires profound measures that would improve conditions for growth and expansion. These include, *inter alia*, sound public policies and support services capable of attracting both domestic and foreign investment to enhance the development and optimum use of available natural and human resources.

To avoid a widening gap and marginalisation from the rest of the world, the industrial sector must be competitive and responsive to the requirements of the global interaction. This would require, in addition to technical know-how and market intelligence, the creation of an enabling environment for private entrepreneurs with minimal control through regulation and investment in complementary services essential to boost a competitive and innovative response to opportunities. An efficient and well-adapted industrial structure for competitiveness will further require the building of entrepreneurial, managerial, and technical capabilities through education, research, training on-the-job, and experience.

Thus, there is a need for a competitive industrial policy, which includes the provision of a package of market information, assistance in the acquisition of technology, subsidised credit, tax holidays, and incentives to new investments. Supporting services and institutions are also required to enhance the competitiveness of the sector.

The competitiveness and efficiency of enterprises often depends on the availability of infrastructure and clusters of mutually supporting services and institutions of the markets in which they operate. These include, among other things, institutions for

industrial standards, testing and quality assurance, design, training, technology acquisition, dissemination and adoption, information, research and extension services.

With regard to market difficulties, one of the main obstacles are the absence of effective local demand that can boost the competitiveness of manufacturing industries. Among the main reasons for local market difficulties is, of course, high level of poverty in the country and its subsequent on the purchasing power of the people. This boils down to the failure of the development strategy we have been pursuing so far. All the development strategies to date have failed to produce a wealthy and market oriented peasantry and wealthy urban population. We need to transform the economy and create an effective demand. We have to transform agriculture from livelihood engagement to commercial engagement and increase land-labour ratio by transforming agricultural employment into non-agricultural employment. For this to come, non-agricultural sectors particularly manufacturing has to grow supported by a multifaceted macro and sectoral policies. The current development strategy, ADLI, badly needs some thought in line with this. The success of ADLI should be measured not in terms smallholder agricultural output growth but in terms of reducing labour-cultivated land ratio, increasing volume of marketed surplus and mobility of agricultural labour force towards other sectors of the economy where there is more productive engagement.

Government partnership with the private sector should not be considered as an optional affair. The motto of the Government should be: recognise opportunities, utilise synergies, and work together. As it stands now, private sector involvement in policy-making is minimal. Institutionalised processes of public-private dialogue are virtually absent. Thus, the Government has to enact legislation that facilitate instituting public-private partnership which allow structural dialogue at different levels with clear mandate and constituency.

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The Social Construction of Technology: Media's Role in "Disturbing" the Stabilization of Finchaa's Ethanol-Kerosene Blend ('K-50')¹

By Setargew Kenaw²

Abstract

This paper aims to show how the design, production and stabilization of a given artifact could be socially constructed. Grounded in Science and Technology Studies (STS), the perspective dubbed as "social construction of technology" (SCOT) provides us with analytical tools such as "relevant social groups," "stabilization," "interpretive flexibility of meaning" and "disturbance." On the basis of these analytical tools, this study tries to show the condition in which Finchaa Sugar Factory's ethanol-kerosene blend ('K-50') was to reach the stage of stabilization. More particularly, the study focuses on the "disturbance" – this is a technical word in SCOT – that the media staged and, as a result, nearly knocked K-50 out of market. The principal value of this study lies in bringing together engineering knowledge and the social sciences in the Ethiopian context. The study could somehow be taken as experimental in that it helps us to see the interface between the two areas – an interface which is given little or no consideration among either social scientists or technologists in many 'developing' countries.

¹ The final version of this article is submitted in March 2006.

² Lecturer, Department of Philosophy, Addis Ababa University. Email: setargewk@yahoo.com

1. Introduction

1.1. The development and production of K-50: background story

This paper deals with the development of ethanol as alternative fuel in Ethiopia. The theoretical framework used here is known as the “social construction of knowledge” (SCOT), a framework developed by scholars working in a field which has become to be known as Science and Technology Studies (STS).

Now, coming back to the project under study: The project belongs to Finchaa Sugar Factory (hereafter simply referred as ‘Finchaa’). Finchaa, which is one of the sugar factories in Ethiopia, produces ethanol from molasses. First initiated because of environmental concerns, Finchaa begun producing ethanol almost as soon as it started producing sugar. This was around the end of the 1990s. Initially, the factory started supplying its ethanol to pharmaceuticals and factories engaged in producing alcohol beverages.

At about the beginning of 1999, Finchaa had around 2 million litres of ethanol stock. Then, the factory management started to consider producing fuel for cooking stoves by way of getting a wider market. Chemical engineers started working and they came up with K-50. The product became to be known as K-50 because the product is a blend of 50 percent kerosene and 50 percent ethanol. The factory opted for the qualifying term “K” (acronym for kerosene) instead of “ethanol” because kerosene is popularly known as a fuel for cooking stoves in Addis Ababa and a few towns.

The designing and testing process of K-50 took around four years. The factory did some promotions. I myself had the chance of visiting a trade show in which K-50 was one of the products. This was in 2002. At this time, Finchaa had finalized the construction of ethanol-kerosene blending station in Addis Ababa. Soon after the exhibition and certain additional promotional activities, Finchaa made a business deal with private companies for the distribution of the fuel.

Once the distribution of the fuel started around July 2002, complaints started to surface. Newspapers reported incidents, that stoves using K-50 exploding in some houses, causing injuries to some people. These newspapers reported that some of the casualties that suffered serious burns needed to be hospitalised for some time. Finchaa administration and the engineers responsible for the design responded that K-50 could never be the problem by itself. They said that the main reason for the explosions was the improper use of the stoves.

1.2. Analytic tool and source of information

This research project focuses on the link between the design process and the social factors that shape the product. I will more specifically try to analyse the role of the different social groups that attribute differing meanings to the technological artifact under discussion. The model or tool that my analysis will employ is the social construction of technology (SCOT). Unlike many other tools, I have found SCOT very appropriate for analysing the various variables involved in the story of K-50. (I used the term story here because the artifact doesn't still seem to be, in the language of SCOT, "stabilized.")

Interviews and unpublished materials were my main sources of primary data from Finchaa Sugar Factory. Other sources I used include newspaper articles and my own personal observations. Last but not least, I consulted secondary sources, including books and articles on SCOT.

2. Theoretical framework

In the field which has increasingly been identified as "Science and Technology Studies (STS)," social scientists and technologists have been able to develop various conceptual frameworks in order to describe or define as to what determines the design, production and marketability of technological products. Among these frameworks, actor-network theory (ANT) and social construction of technology (SCOT) have been widely used. According to ANT, a given technological artifact or scientific theory is a product of a network of actors. Bruno Latour, a French sociologist of science and one of the key figures to develop ANT, preferred to use the term 'actant' instead of 'actor' because he believed that the network also includes non-human actors. Since the term actor has the obvious implication that we are referring to a human agent, Latour coined the word 'actant' so that it could also be used to describe non-humans. In order to illustrate how Latour describes actants, Peter-Paul Verbeek writes: "A pile of matter that we call an 'automobile' can only exist as such in a context that includes also gasoline, gas stations, pumps, refineries, highways, auto mechanics, automobile manufacturing plants, and so forth. What exists 'in itself' is only metal and synthetic material" (Verbeek 2005: 149). Gas stations and manufacturing plants are equally actants as the mechanical engineer that designs the automobile or the user that drives it.

Those who subscribe to the perspective known as the social construction of technology (SCOT), on the other hand, emphasize the social context in which artifacts are designed, produced and used. According to the SCOT approach, a technological artifact would get certain traction when meaning is conferred on it by social forces such as the designers, market forces, users' needs and demands, etc. Put concisely, a technological artefact is a social construction.

Trevor J. Pinch and Wiebe E. Bijker are known to have developed SCOT. Following the tradition of sociology of scientific knowledge, Pinch and Bijker have been able to establish SCOT as one of the powerful tools that researchers in science and technology studies could employ. In this regard they have also supplied us with key concepts such as "relevant social groups," "interpretive flexibility of meanings," "closure," "disturbance," etc. As already noted from the outset, it is this theoretical framework that is used instead of ANT or any other framework. "Why SCOT?" one may ask here. The conceptual tools that SCOT employs are very appropriate for analyzing a new products' entrance to the market. More importantly, the concept of "disturbance" is very appropriate to discuss the kind of resistance that a product like K-50 encounters. However, in order to fill the gap that SCOT leaves out I will briefly look into some other useful approaches in the concluding section of the paper.

Now, I will be defining some of the key terms that stem from the perspective under discussion. By social relevant groups, Pinch and Bijker are referring to the main agents – institutions as well as individual persons – that affect the status of the artifact right from its production to the stage when it will be in the hand of users. Referring to the expression in question, they write:

The term is used to denote institutions and organizations (such as the military or some specific industrial company), as well as organized or unorganized groups of individuals. The key requirement is that all members of a certain social group share the same set of meanings, attached to a specific artifact. In deciding which social group are relevant, the first question is whether the artefact has any meaning at all for the members of a social group under investigation. (Pinch and Bijker 1984: 414).

Drawing on the SCOT approach, I have also categorized 'interested' groups into relevant social groups and described their respective role (see section III, subsection 3.1 below). The term "interpretive flexibility of meanings" denotes the variety of perspectives through which different social groups look at the artifact. In the case of K-50, for example, those who developed it see it as "smoke-free," "environmental-friendly," etc. whereas the end-users may see it as a product which is "dangerous" or as an

“explosive” material. Thus, the way a given technological product is perceived depends on the position that individuals or social groups hold vis-à-vis the product.

“Stabilization” refers to the phase when a technological artifact reaches some kind of closure whereby it attains reputation as a product in the market. At this stage the product in question may not need any more improvement unless the producers would like to provide additional application for potential customers. When a new product is introduced into the market, it is a usual practice that it would go back to the designers in order to correct the defects or imperfections that end-users have encountered. It would therefore take a number of tos and fros before an artifact reaches a stabilization or relative “serenity.”

The term “disturbance” depicts the resistance that a new product encounters. In current economic setting the media plays a very important role in promoting or discouraging the marketability of products. As has already been pointed out, the concept of “disturbance” is a useful analytical tool for depicting the resistance that K-50 met in its attempt to establish itself as a marketable product. The focus of the paper is all the more on the phenomenon of disturbance because K-50’s life-span was short and this was only limited to the first few months of its childhood. In other words, out of the various phases that a product should pass through, in the case of K-50 it was the resistance phase that came out remarkably well.

3. Findings and interpretation

3.1 Relevant social groups and the interpretive flexibility of meanings

The development and introduction of K-50 as alternative fuel has involved many groups of people as well as organizations and associations. Obviously, I had to identify the agents (in the form of individuals, companies, professional associations, or media) before classifying them into “social relevant groups.” As already noted above, the major agent responsible for developing K-50 was Finchaa Sugar Factory. Behind Finchaa, there are funding agents such as the Ethiopian government as principal owner of the factory, and African Development Bank (ADB) as the financier of construction of the factory. ADB was also responsible for enforcing the construction of an ethanol plant as additional complex so that the factory could also make use of the by-product molasses instead of disposing it into the Finchaa River. Environmental protection was therefore high on the agenda of the bank – environmental protection

was seriously considered because Finchaa was tributary of Blue Nile, which supplies 80% of the water to the Nile.

Other agents include:

	Organization/people	Role
1	Ethiopian Science & Technology Commission (ESTC)	Funding research project
2	Addis Ababa University, chemical engineering	Laboratory test of the product
3	National Alcohol and Liquor Factory	Laboratory test
4	Oil Companies, viz. Shell, Mobil, Total, Agip	Stakeholders
5	Environment protection agencies	
6	Distributors of K-50	
7	People using cooking stoves	
8	Media (radio, television, newspapers)	Promotion or resistance
9	Professional associations	Promotion or resistance
10	Stove providers/manufacturers	

Now the next step is to classify these agents into “relevant social groups.” According to Pinch and Bijker (1987: 30), a “relevant social group” is a group whose members “share the *same* [emphasis mine] set of meanings, attached to a specific artifact.” Here then comes the challenge: How are we able to find socially relevant groups who share the same meanings? Well aware of this difficulty, Pinch and Bijker themselves have questioned whether a group is homogenous (ibid: 32-34), and, as a result, have shown how an apparently homogenous social group (for example, cycle users) could further give rise to a separate relevant social group (women cyclists). As Pinch and Biker underlined in the course of their discussion³, it is not still impossible to classify the agents I mentioned above into relevant social groups for the purpose at hand here. In other words, when I identify a certain relevant social group it does not mean that all the members I put together share exactly the same meaning; rather they may share a very general meaning.

³ “We want to stress that our model is not used as a mold into which the empirical data have to be forced.... The model has been developed from a series of case studies and not from purely philosophical or theoretical analysis. Its function is primarily heuristic....” p.38

I have accordingly classified the agents I mentioned above (which are about 12) into three relevant social groups. The first group I call “artifact developers.” This category consists of Finchaa Sugar Factory (including the administration as well as the engineers who developed K-50), the Ethiopian government, African Development Bank, Ethiopian Science and Technology Commission (ESTC), Addis Ababa University, National Alcohol and Liquor Factory, oil companies, professional associations, and environmental protection agencies. Members of this group seem to share the meaning that K-50 is an environmental friendly product that could serve as alternative fuel for people using cooking stoves. (As I shall show soon, some of the members of this first group will also be mentioned under the group I will call “artifact resisters.” To pin down an example here from the outset, I would take ESTC because, though it is the principal financier of the development of the artifact, it has finally proven that its voice is rather divided. There is no absolute homogeneity of interest in the other agents either.)

The second relevant social group I would call “resisters.” I am using the term “resister” here not in the negative sense of functionalist explanations use it. Rather, I use it, following Ronald Kline, in the sense that it is a “means of negotiation.”⁴ Thus, when an artifact is resisted by users, it doesn’t mean that these users are creating trouble for the company producing the product. In fact, in most cases resistance is an effective way of assisting the company to improve on its artifact. It would therefore contribute positively to the perfection of the product in question. For resistance would ultimately direct the designers to the flaws or inconveniences that were overlooked or simply neglected for one reason or the other. To put it differently, resistance means returning the artifact to its designers so that they could do something to it.

When it comes to the group I call resisters in this study, the media would come to the forefront. I would like to further qualify the media as “confronting resister” because it was this force that has all along actively objected to the use of K-50. (I will shortly discuss this.) But in this group again I include some of the agents I already mentioned in the first group, namely a segment of the factory’s administration, ESTC, Ethiopian Society of Chemical Engineers, and oil companies. As the engineer who had been responsible for the development of K-50 related, some members of the administration of the factory were totally against the very project itself.

⁴ After reviewing various interpretations of what resistance means in the context of the introduction of technological artifacts, Kline maintains: “In my view, resistance is a common means of negotiation among producers, mediators, and users that helps to create socio-technical change.” (Kline 2003: 52)

The position of the oil companies has been obscure from the very start. Although their role as resisters is not visible, the engineers I interviewed implicate them as the possible voices behind the media. I describe the position of the oil companies and that of the administration of the factory that opposed the artifact from the start as “obscure resisters” because their part is not explicit enough.

The next two members I included for the second time are very interesting agents for my analysis. These are the Ethiopian Science and Technology Commission and the Ethiopia Society of Chimerical Engineers. I say they are interesting because these same two organizations were at first unambiguous in giving their support, the first financially and the second morally because it had almost awarded the engineer principally responsible for the design before it announced that it had retracted its decision. I describe this agent “faltering resister” because it is after the media outcry that they started to withdraw their support. When it comes to the Commission (which again I dub as “faltering resister”), it did not only withdraw its support but it didn’t take it much time to publicly declare its opposition; in fact, by doing so, it joins in the media’s chorus of disapproval.

The third relevant social group is the group I call the “end users.” These are people who used K-50 as fuel for their cooking stoves. I describe them as end users because, as I shall show soon, the media made their protests in the name of the users. Hence, I have found it very convenient to dub people who actually use the fuel as end users for the sake of clarity.

Furthermore, the meaning that these (end-) users give to the artifact in question is also somehow divided. First, they see in it, after the advertisement of the producers, as soot- and smoke-free material. Later on, after reported explosions (and obviously some of them have suffered the hurt first-hand), they started to conceive it as “dangerous material.”

3.2 Re-focusing: “disturbance” and the respective responses

This subsection is of course the most important part of the paper. Its focal point is the resistance that K-50 has encountered and the accompanying responses. Before I go to the actual analysis, I would like to answer one crucial methodological question: What is the need to focus on the difficulties that the artifact encountered? Bijker (1990) points out that when we are dealing with social relevant groups surrounding a

given technological artifact, our analysis must “focus on problems and solutions.” According to Bijker (*ibid*: 58), it is around this relation of problems and solutions that the interpretive flexibility of meanings is formed. He contends that, whether we are studying the atom or a social system, “not much would be learned by looking at it in a steady state.”⁵ (*ibid*) Focusing on the “disturbances” surrounding an artifact would give us a better look at the meanings that different social groups attribute to an artifact. Besides, as I already noted when I was introducing the term “disturbance,” K-50’s public life was so short lived that it doesn’t have an extended ‘biography’. We do not have therefore much to talk about the other phases of its lifetime.

When it comes to my analysis, I will take up the media’s reactions and subsequent responses from different parties. After about a couple of months that K-50 became available for sale on the market – the beginning of the sales was around July 2002 – the government owned radio and television came up with news that stoves using K-50 had exploded and caused minor and serious injuries on few individuals. Then, a private newspaper by the name *Addis Admas* – a popular weekly Amharic⁶ newspaper – came out with a creepy article⁷. A closer scrutiny reveals that the article is actually sloppy. However, its power lies elsewhere – it employed highly appealing and powerful imageries.

The article’s title is in the form of a catchy rhetorical question: “What has K-50 to do with ‘*findata*?’” Literally speaking the Amharic word ‘*Findata*’ means explosion. However, the term was rather used in a way to represent something cryptic and negatively powerful imagery. The word was used as a disparaging nickname for “restless” teenagers. A young man risks or, in some cases, would like⁸ to be called ‘*findata*’ if he is taking part in in-group skirmishes, or if he is harassing young girls in school, or if he is a persistent problem to his own family, etc. In this regard, the term *findata*, over and above its literal meaning (i.e. explosion), was uploaded with powerful imagery. Then, the writer of the newspaper article relates that it had become a fashion to use the word ‘K-50’ instead of *findata* in order to describe those allegedly troublesome teenagers. Here is where the major part of the attack started.

⁵ Following his rigorous review of the history of the bicycle, Bijker comments: “So, in describing the artifacts I tried to avoid the uninformative states of equilibrium and stability. Instead, the focus was on the problems as seen by the various social groups.” (1990: 58).

⁶ Amharic is the national language of Ethiopia.

⁷ *Addis Admas*, August 18, 2002.

⁸ Some young men were proud of being called ‘*findata*’ – they feel that it lends them the image of a rebel-hero. But, for other segments of the society (I mean for those who effectively use it), the term triggers the image of troublemaker.

Then, it resumed thus:

Soon after the eulogies that we listened by radio and television, that it is “odourless,” “smokeless,” or what have you, K-50 has become ominously dangerous.... As I have learnt from legal experts, the Finchaa Sugar Factory must be brought to justice. No sooner than it [K-50] was on the market, it spreads its fire all over Addis Ababa. Amazing! Addis Ababans have become highly concerned and frightened. In two weeks time alone, about fifty people have been blazed by fire. When you see the victims, their faces burned and roasted, oh, how terrifying and alarming it is! One of the explosions has even taken the life of one young and beautiful girl. Do our young people whom we call *findata* commit such an atrocity beyond doing some minor troublesome things? By no means! The only problem is their immaturity. When it comes to K-50, we have got an entirely different story. K-50 would rival ‘Satan’s’ works. [translation mine]

The article doesn’t stop its assault at this. It goes on and on in this fashion. Let me add one more striking statement which the writer has made around the end of the article. After sneering at the factory for its pretentious, or, to use the newspaper’s own expression, “green-peace-like” environmental concerns, the writer finally slips down the slippery slope and appeals for justice presuming that (1) what he lists all along is true, and (2) that all are instances of criminal acts.

When new technological artifacts enter into the market, especially when they are homegrown, various studies have made it clear that they would be easy preys to such ominous objections. Having a brief visit into Bijker’s highly illuminating illustrations would be sufficient to show how such objections are strikingly similar even if they are from totally different contexts. Referring to the obstacles that cycle users had been encountering around the end of the 19th century, Bijker quotes mocking cheers (e.g. “Monkey on a gridiron” (1990: 47)) that pedestrians and cart drivers directed against cyclists. An excerpt from an account that dramatizes the cyclist/pedestrian encounter is read as follows:

Pedestrians backed almost into the hedges when they met one of them [cyclists], for was there not [sic] almost every week in the Sunday newspaper the story of some one being knocked down and killed by a bicycle, and letters from readers saying cyclists ought not to be allowed to use the roads, which, as everybody knew, were provided for people to walk on or to drive on behind horses. “Bicyclists ought to have roads to

themselves, like railway trains” was the general opinion. (F. Thompson quoted in Bijker 1990: 48)

An attack against women cyclists were much worse. An excerpt taken from 1900 *Münchener Zeitung* reads:

Unashamed, proud like an Amazone, the graceful lady displayed herself to men’s eyes. We ask: Is this the newest form of bicycle sport? Is it possible that in this manner common decency is being hit in the face without punishment? Finally: is this the newest form of advertising for certain female persons? Where is the police? (quoted in Bijker 1990: 49)

It does sound like the Ethiopian writer who literally cries “Where is justice!” when he writes against the ethanol-kerosene blend. In fact, the newspaper article I have been discussing so far has, interestingly enough, been trying to caricature (I do not know whether this was deliberate on the part of the writer) the writing style of a period when Emperor Menelik II introduced telephone, railway, vehicles, etc. to Ethiopia.⁹

Now, I will pass to the reactions of the other relevant social groups. First, I will look at the responses of what I called “faltering resisters.” (Recall that I called the foregoing parties as “faltering resisters” because they switched from support to objection after the reported explosions.) From this category again, I will only discuss the response of the Ethiopian Science and Technology Commission (ESTC)¹⁰. Again here *Addis Admas* (25 August 2002) was instrumental. This time the newspaper invited readers on the issue of K-50 under a title: “**K-50 Fuel: Untimely Born Foetus?**” In his interview with *Addis Admas*, the person representing ESTC pointed out that designing an appropriate stove for using the new fuel was part and parcel of the project. Thus, he accused the factory for not doing its assignment. When asked as to what ESTC did on its part (as one of the principal stakeholders of the project), he said that his office had been expecting a project report from factory. And yet, so he

⁹ Emperor Menelik, who ruled Ethiopia from 1889 until his death in 1913, was known (among other things) for his highly enthusiastic “modernization” endeavours. When telephone was for example introduced for the first time – this was around the end of the 19th century, it provoked a serious objection from priests. Clerics representing the Ethiopian Orthodox Church appealed to the emperor that he should not use it since it was the “the work of Satan himself.” Similar objections were expressed when the emperor took subsequent measures in order to introduce other new technological devices. (Paulos 1992)

¹⁰ The other agent that came up with a second-thought about K-50 was the Ethiopian Society of Chemical Engineering. Like ESTC, it withdrew its support after the uproar. It expressed this by literally withdrawing its intention to award the inventor.

contended, his office had learnt, like anyone, from the news that the factory had started selling the fuel for consumers.

The issue of “appropriate” stove has therefore come out as a result of this conflict. In relation to this, the newspaper had also interviewed the manager of a workshop producing cooking stoves. The stove producer argued that the main problem of K-50 lies in that the wick stove (the stove most people use for kerosene) was absolutely unsuitable for k-50. He added that the factory had approached him once so that his workshop could produce the “suitable” stove for K-50 but this didn’t come to fruition because “the factory was not ready to fund the research component of the production.”

The factory then made a formal reply to all these and other accusations (*Addis Admas*, September 7, 2005). It insisted that the factory had made all the routine tests and proved that the wick stove is appropriate given “it is used carefully.”

When I asked Mr. Mesfin Abate (the person who designed K-50) about the preliminary tests, he answered that they had made all the necessary tests including “customer tests.” He conceded that two incidents of fire discharge had occurred during customer tests and these were due to “malfunctioning of the stove.” When I asked him of his personal opinion on what he thinks is the principal reason for the reported accidents, he related:

...people [who use the wick stove] are accustomed to add kerosene while the stove is functioning; besides, they do not clean the surface of the stove. K-50, by its very nature, catches fire easily; thus, it needs serious safety precaution. We had tried to create awareness regarding its use by distributing leaflets on which we wrote all the necessary precautions that users must follow. (Taken from reply to my interview questions.)

For Mr. Mesfin, the wick stove is a suitable stove for using K-50. The problem lies in the way people use it. That is what he stresses repeatedly. However, be this as it may, this reply presupposes that the stove users are well informed or, at the very least, can read and write. Besides, it must be noted that even before the introduction of K-50, reports show that one of the sources of fire accidents in the capital is the misuse of the wick stove when people use it to cook with kerosene. While this fact is not hidden to many people, including the Finchaa Sugar Factory, the expectation that people would prevent dangers by reading a manual is implausible. An inquiry into the

identity of the actual users of the stoves would have sufficed to foresee that people do not read manuals because they do not read at all. Secondly, even if they have some education, it may not be adequate enough to form the habit of reading manuals.

The problem here is that, as Bijker (1997: 77) points out, we have only the comments of the “vocal” agents. As one can see from the analysis, the end users are conspicuous by their absence. We do not hear their voices. That is why I tried to fill the gap by commenting on the situation of the end users. In fact, I do not need any systematic generation of data at the moment in order to comprehend the situation of the users. Most people who actually use the wick stove at individual homesteads are uneducated women working for small amount of monthly salary in these homesteads. Thus, what is missing in the controversy for and against the use of K-50 is the condition in which it is actually used at the household level. Their absence in the controversy therefore seems an expression of their absence in other dominant discourses.

Now, to conclude the last two subsections, let me briefly come back to the interpretive flexibility of meanings. For the media, K-50 is something that “explodes;” it is something that is very dangerous. For Finchaa and the principal engineers involved in the design of K-50, it is environmentally-friendly artifact and a homegrown invention that assists the country in reducing its reliance on imported fuel. For the end users, though we do not hear their own voices, we could gather that their inclination would be to share the meanings of the media. For, as I have gathered from my interview with those involved in the project, immediately after the media’s reports sales had sharply dropped down. At this moment, K-50’s major consumer is one ceramic factory – it uses it for heating its furnaces. Other factories are also considering adopting it for the same purpose. The fact that K-50 is now being used mainly for other purposes other than what it was intended for originally would very well demonstrate how the meaning of a given technological artifact is socially constituted.

3.3. Stabilization (closure)

As the above analysis shows, the destiny of K-50 has not yet been determined. Thus, it has not been stabilized. However, it is still possible to conjecture its direction. At this point, what Pinch and Bijker (1987) discuss of closure is very useful. Of very special importance here is the distinction they make between two types of closures, namely

“rhetorical closure” and “closure by redefining the problem.” The first type refers to when advertising becomes the prime instrument to end “controversy”:

To close a technological “controversy,” one need not *solve* the problems in the common sense of that word. The key point is whether the relevant social groups see the problem as being solved. In technology, advertising can play an important role in shaping the meaning that a social group gives to artifact. (1987: 44)

Extending this logic to the case of K-50, it is possible to argue that the artifact has reached the stage *where it is now* as a result of negative rhetoric closure.

But more appropriate to the case of K-50 is the second type of closure that Pinch and Bijker discuss. In other words, “closure by redefining the problem” seems to explain the possible direction that K-50 might follow in the future.¹¹ In spite of the fact that, and also because of, the opposition that it encountered, its use seems to get forcefully redefined. In other words, though it has become a problem when it is conceived or interpreted as a household fuel, its future *as industrial fuel* seems to be brighter.

4. Conclusion

Different theoretical models are employed in order to analyse the development, introduction, and use of different technological artifacts. Although the field of science and technology studies is a relatively new area of study, it has generated a good number of theories or theoretical models. The social construction of technology (SCOT) is among these.

As I have tried to demonstrate above, it is the SCOT model that the analysis of this paper has employed. Following SCOT, I have analysed the story of the development and introduction of K-50, which has been developed as alternative fuel in Ethiopia. One of the key steps in such an analysis is identifying the relevant social groups and subsequently analyzing the meanings each ascribe to the given artifact. The logic

¹¹ Pinch and Bijker (1987) relate that although the air tire had encountered an opposition from cyclists, it was not a problem at all for sporting cyclists: “...the meaning of the air tire was translated to constitute a solution to quite another problem: the problem of how to go as fast as possible. And thus, by redefining the key problem with respect to which the artifact should have the meaning of a solution, closure was reached for two of the relevant social groups.” (1987: 46)

behind this is that it is the relevant social groups that “constitute” an artifact (Bijker 1990: 85). In other words, it is the “interpretive flexibility,” or the meanings that different social groups give to an artifact that makes the artifact “working” or “non-working.” Bijker maintains:

The “working” and “non-working” of an artifact are socially constructed, rather than intrinsic properties of the artifact. One artifact (in the old sense) comprises different socially constructed artifacts, some of which may be “working”, while others are “non-working.” (1990: 83)

In this regard, my analysis has also tried to canvass the role of each social relevant group in the constitution of the meaning of K-50. At this moment, as I am writing this paper, K-50 has two diametrically opposite meanings. For the media and for most people who used it for some time, K-50 is “non-working.” Whereas for the factory producing it and for the industry currently consuming it as well as for factories which are considering using it, it is “working” in the sense that it still exists and functions. What I would like to reiterate at this point is that the functions of technological artifacts is something that is socially constituted. This is what the SCOT approach is trying to demonstrate.

The other point I would like to touch upon in this conclusion is the strength of SCOT in comparison to actor-network theory (ANT), and, shortly afterwards, the relative strength of the latter compared to the former. One of the strong sides of SCOT lies in that it enables us to follow the views of all the actors involved in the development and use of a technological artifact. When it comes to ANT, it rather gives priority to the “script” of the designers. What the designers think or what they are supposed to have conceived plays a dominant role in analyzing an artifact. In this regard, an analysis that follows the ANT approach would seem to undermine the place of users. In their “Introduction” to the book *How Users Matter: The Co-Construction of Users and Technologies* (2003: 3-4), Nelly Oudshoorn and Trevor Pinch very well highlight the contribution of SCOT in this respect. When Bijker notes that “there is no artifact which is not constituted by a relevant social group” (1990: 85), he is emphasizing the significance of the user and other relevant social groups in the construction of a technological artifact.

Now let me turn to ANT. What would have been ANT’s contribution were it the approach used here instead of SCOT? The notion of “script” as used by Madeleine Akrich and Bruno Latour (1992) would have enabled me to analyze the discrepancy between the designer’s “inscription,” on the one hand, and the “description” of the end users, on the other. As I have shown when I discussed the designer’s point of view,

there has been repeated contention that the problem lies in users not being careful when they use the fuel. In this regard, the claim seems to be that the consumers have “misread” the technology. On the part of the users (at least, as I understood it via the media), on the other hand, the factory (a category which includes both designer and producer) had provided the wrong text. It follows from this that ANT would have been very useful in bringing out this aspect of the issue very well¹².

Finally, the principal value of this study lies in bringing together engineering knowledge and the social sciences in the Ethiopian context. The study could somehow be taken as experimental in that it helps us to see the interface between the two areas – an interface which is given little or no consideration among either social scientists or technologists in many ‘developing’ countries. The importance of the field of Science and Technology Studies, and methodologies such as “social construction of technology,” “social shaping of technology,” “actor network theory,” and variety of approaches in the field of Philosophy of Technology (“phenomenology of technological artifacts,” to mention one) is in this regard unquestionable. Especially, for countries which rely much on imported technological products and have little incentive for home-grown technological artifacts, such approaches could chart new ways of developing or adopting new technologies. Lack of such perspectives would immediately lead us to misconstruing the situation we found ourselves in whenever we encounter difficulties like one that marred K-50. In the case in question, we have seen that both designers and users seem to panic instead of trying to understand the problem as an aspect of the development of a new artifact. The designing or producing factory saw in media commentaries nothing but an act of sabotage whereas the media looked at the product as an instance of premeditated evil doing. The noted sociological and philosophical perspectives would therefore help us to avoid such hasty and quick-tempered generalizations, and, instead, illuminate the manner in which technological artifacts are designed, produced, and appropriated or used by consumers.

¹² I would also like to point out the conspicuous absence of the gender aspect here. Employing one of the various gender approaches in science and technology studies might have generated an entirely different type of data that might in turn enable us to come up with a different meaning or interpretation of the story under discussion in this paper. As I have already noted in the course of my analysis, despite the fact that (in effect, because of) most end-users of the fuel under discussion are obviously women (most of whom are uneducated and poor housewives or housemaids), their voice in the hot controversy is completely absent. And this absolute disregard is actually a function of their absence in other dominant discourses.

Appendix

Main Interview Questions for experts involved in the development of the project

1. When was project K50 conceived?
2. Who took the initiative to develop it?
3. Which institutions were principally involved in the project?
4. Was it tried before this in other countries?
5. What were the engineering and economic rationales to conceive and develop this product? (Please describe and comment on the design process)
6. How many years did the research take? (Please indicate the duration)
7. When did the final product reach the users?
8. Were there prior attempts to introduce (or orient users about) the artifact (i.e. K50)?
9. Were there objections/competing interests that were actually or potentially obstacles to the development of the artifact?
10. Who were the principal distributors? How many are they?
11. What were the principal problems that users of the product encountered?
12. What was the response of the public?
13. What was the response of the media? Was the reaction of the media exaggerated?
14. What was the response of professional associations to the problems that the product or the way it was handled by users created (such as Chemical Society of Ethiopia, Society of Chemical Engineers, etc.)
15. Was there any response from government agencies (such as Science and Technology)
16. What do you think is the major source of the problems? (Please elaborate this point as much as you can)
17. What were the measures taken by the producers/distributors?
(a) immediate actions _____ (b) long term actions _____
18. What is the current status of the project? What is its prospect? What measures are being taken to prevent similar problems? What actions are planned in order to reverse/redress the negative image that the media or any other agencies created?
19. Does Gaia project have something to do with K50? If yes, is it a continuation of K50 or is it an attempt to substitute it? If the answer is no (i.e. there is no connection between these two projects), is it intended as just another alternative fuel like K50? (Please comment on this project as extensively as you can)
20. Please feel free to add anything not included above.

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Is the Ethiopian Leather Industry on the Right Track? An Empirical Investigation¹

Worku Gebeyehu²

Abstract

This study aimed at examining the existence of technical efficiency differences among tanneries and leather processing firms using stochastic frontier production function models. The study considered 10 tanneries and 24 leather processing firms for the period 1996 to 1999. Mean technical efficiency of tanneries was about 83 percent for the entire period, albeit showing a declining trend. Among tanneries, larger firms were found to be more efficient because of the advantage of scale economies. Contrary to the widely held view, exporting tanneries were not as efficient as inward oriented ones except that they were using capital intensive and relatively modern technologies which might have allowed them producing good quality products for their target markets. Although, leather processing industries were operating far below their designed capacity, the empirical evidence externalized the causes for their poor performance. The Translog production function estimated through OLS was found to better characterize their production technology implying that there was not statistically significant technical efficiency difference amongst them. External constraints might include unfair competition with illegal imports, lack of easier access to finance, and limited government support in light of the fiercely competitive global trade and the infant nature of the sector. Albeit, statistical tests do not affirm it, an increasing trend of inefficiency has been observed in leather processing industries. This is perhaps a reflection of firm level weaknesses associated with mediocre product design, use of backward machines, limited international exposure and passive reaction to competitive products. Thus, both tanneries and leather processing industries ought to firmly work in addressing their weaknesses and accustom themselves with the challenges of the changing global environment. Government should also play its supportive role in terms of ensuring a fairly competitive domestic market, providing market and technology related information, supporting trainings, and minimizing transaction costs related to the provision of its services.

¹ The final version of this article was submitted in June 2005.

² Worku Gebeyehu, Researcher, EEA/EEPRI. I gratefully acknowledge the constructive comments of two anonymous referees on an earlier draft of this article. I would also express my indebtedness to Ato Kassahun Tadesse of EEA/EEPRI for his helpful comments and suggestions.

1. Introduction

Ethiopia counted many years without recording a meaningful change in the structure of the export sector. The sector has been dominated by a handful of primary commodities, coffee being the key. Except in some exceptional years of price shock in the world coffee market, stirred mainly through excess supply by major producing countries, the share of manufacturing export has never been exceeded more than 20 percent [NBE, 2002]. Within the manufacturing export, leather products, in their semi and fully processed form, constitute more than 50 percent. Although, there are attempts in the food, beverage, textile, and chemical industrial groups, the dominance of the leather sub-sector still continues. With a relatively modest share in gross value of production (7.2 percent), persons engaged (7.3 percent) and fixed assets (8.6 percent) of all medium and large scale industries, the leather sub-sector was able to contribute about 73 percent of manufacturing export in 1999/00. The export earning was about 44 percent of the gross value of production of the sub-sector in the same year. It is the only industrial group, which could finance its own foreign exchange demands for the purchases of imported inputs [CSA, 2001]³.

Notwithstanding its dominant position in the midst of highly inward oriented industrial sector, the performance of leather sub-sector is not satisfactory given the huge livestock potential and the country's ardent demand for foreign exchange earnings. It is a common knowledge that Ethiopia has a very large livestock reserve, which few countries are fortunate to be endowed with. According to Befekadu and Berhanu (2000), the country has an estimated livestock population ranging between 30-35 million Tropical Livestock Unit⁴ (TLU). Berhanu and Kibre (2002) also noted that Ethiopia held about 15.75 percent of the cattle and 9 percent of the sheep and goat herd of Africa in 1996, which confirms the claim that Ethiopia has the largest livestock population in the continent. Despite the fact that the off-take or actual utilization rate is comparably low in contrast to the pack or the potential, the country provides about 2 million pieces of hides and 13.6 million skins annually. Had this amount been properly utilized, leave alone the potential; it could have been a great opportunity for those currently operating and potential investors in the sub-sector in particular and the country in general.

³ For instance, in 2002/03, tanneries and leather processing industries were able to fully cover their own and contribute about 21 percent of the total foreign exchange requirements of the manufacturing sector to acquire imported inputs.

⁴ Tropical Livestock Unit (TLU) is a standardized measure of the number of live animals of all sorts using a conversion factor of 250 Kg as one TLU.

Low performance of the sub-sector is reflected through the fewer number, low level of capacity utilization and small-scale operation of leather processing industries. According to Central Statistical Authority (2001), there were 53 medium and large-scale leather industries operating in the country in the fiscal year 1999/00 with a fixed asset worth of Birr 5.1 billion. These enterprises were able to create job opportunities only for about 7034 persons and had an annual production capacity worth of Birr 1.1 billion.

While sustainable operation in line with the global market requirements and reaping the benefit of export market opportunities requires at the very least commanding the local market, the sector is under severe pressure from imports. Befekadu, et al (2002), indicated that the problem has not only led many footwear industries to slow down their operation but also forced to close down not less than 20 medium and large-scale foot wear industries. Similarly, survey result of Central Statistical Authority (2000 & 2001) revealed that there were about 63 medium and large-scale leather industries in the 1998/99 fiscal year but this figure declined to 53 in 1999/00. As a result of this, the sector was obliged to reduce about 13 percent of workers within 1996/97 to 1999/00. The average rate of capacity utilization of those industries, which were able to survive in the sub sector, was only 49 percent in 1999/00.

Obviously, this indicates the prevalence of severe problems constraining the proper functioning of the sub-sector. These problems may arise from internal or external sources. Externally, before upholding their competitive capabilities, firms that either accustomed to operate in a highly protective environment or emerging infant industries are exposed to swift liberalization that they could not withstand. These industries could have needed a certain learning period and technical support with respect to market search, manpower training and in other similar areas.

The other major problem is the manner that some countries do business in the name of free trade. A study on leather industries of four African countries, Ethiopia, Nigeria, Tunisia and South Africa and China by Berhanu and Kibre (2001) revealed that Ethiopian industries have not been performed any lower than successful exporters of leather products such as Tunisia and China. It was rather illicit trade in the form of dumping and the supply of sub-standard products by foreign firms that led many domestic enterprises out of business. This has been further accentuated due to limited capacity and efficiency of concerned bodies to control such drawbacks and strive assuring a healthy market environment. While this and other external constraints are beyond the sphere of firm level decisions, there are internal problems.

Operating under similar policy, institutional and marketing environment, firms may exhibit different levels of efficiency. For instance, Taye and Teal (1998) found that exporting firms were 32 percent and 15 percent more efficient than non-exporting firms in Cote d'Ivoire and Kenya respectively. Battese et al (2001) estimated technical efficiencies of firms and came out with a result that significant efficiency difference was prevailing not only amongst firms in the different regions of Bangladesh but also within a given region.

In the case of Ethiopia, similar studies have been conducted revealing that firms are operating at different levels of efficiency due to either internal or external conditions. Berhanu and Kibre (2002) assessed the performance of the Ethiopian leather sector using total factor productivity indices and found that not only productivity varied among tanning and footwear industries but also tended to decline over the period of 1995 – 1999. Neither the paper had the intention nor would the methodology employed allow segregating the extent to which firm specific weaknesses contributed for the total factor productivity turn down reported during the period.

Estimating the extent of inefficiency attributable to firm level failures associated with organizing and optimally utilizing available inputs provides policy advice for firms themselves to address their internal weaknesses before opting for external solutions. Besides, making the overall environment conducive, empirical findings of this sort also initiates policy makers to examine the kind of support that they should extend to the existing firms before additional investment outlays are considered. Thus, this study aims at exploring the performance and prospect of the leather sub-sector in line with this view.

A number of factors or characteristics could be cited as possible causes for efficiency variation among different firms. In our case, some of the firms were exporting their products while others were not. Since it is usually the case, it is possible to hypothesize that those enterprises that were able to operate more efficiently than otherwise have penetrated the international market. The other possible hypothesis emerges with relation to size. Large firms may enjoy relatively higher scale economies and use inputs in a more productive way than the case in small scale firms. The objective of this study is, therefore, to examine efficiency variation among leather manufacturing enterprises and in light of this assess the possible future destiny of the industry as a whole. Comparative analysis is also made between exporting and non-exporting, and relatively larger and medium scale firms. Stochastic frontier production functions are estimated through maximum likelihood and technical

efficiency ratios are compared among firms. Considering the fact that tanning industries and leather processors employ totally different technologies due to different modes of operation, the study uses two different panel data sets involving 10 tanneries on the one hand and 24 leather processors on the other for a period of four years (1996 – 1999).

The source of data is Central Statistical Authority. The data set has its own limitations. Number of tanning and leather processing industries reporting to the Authority varied from year to year. Enterprises either reported missing values, highly exaggerated figures or at times they could even become totally out of sight in the data set. In the case of tanneries, the problem is not very much serious. We got only one firm which failed to provide a complete date for four consecutive years. However, in the case of leather processing industries, the total number of firms at end of 1999 were 32 and 24 of them (about 67%) had a four year complete data. As a result, we took those observations that have four years complete data. There was also an attempt to use some other variables that may positively or negatively explain efficiency of firms such as benefit accrued to workers, education, and composition of administrative and productive workers. However, the data management process could not allow this due to several missing values. Thus, findings of this study should be seen in light of these limitations.

2. Model specification and definition of variables

2.1. Model specification

On the basis of Aigner, Lovell and Schmidt (1977), Pitt and Lee (1981) and Battese and Coelli (1992) propose a stochastic frontier production function for panel data having the usual stochastic error term, which is exogenous to the system and firm level effects to be distributed as truncated normal random variables, assumed to systematically vary over time. The generic representation of the model is as follows.

$$\ln(Y_{it}) = X_{it}\beta + V_{it} - U_{it}, \quad i = 1, 2, N; \quad t = 1, 2, \dots, T; \quad (1)$$

where

- Y_{it} is the output of the i^{th} firm at the t^{th} time period;
- X_{it} denotes a $(1 \times K)$ vector of (transformed) input values and other associated variables;
- β is a $(K \times 1)$ vector of unknown scalar parameters to be estimated;

- V_{it} are the usual random errors, measuring the positive and negative effects of exogenous shocks, assumed to be iid with $N(0, \sigma_v^2)$ independently of the U_{it} s;
- U_{it} s hold non-negative values which are assumed to account technical inefficiency in the model;

The left hand side of equation (2.1) involves two random variables, V_{it} and U_{it} , the summation of which could be expressed as e_{it} . Thus, $\sigma_e^2 = \sigma_v^2 + \sigma_u^2$ and $\gamma = \sigma_u^2 / \sigma_v^2 + \sigma_u^2$. Technical efficiency for i^{th} firm in the t^{th} time period is defined by,

$$TE_{it} = \exp (-U_{it})^5 \quad (2)$$

There are mixed views about the distribution of U_{it} revolving around the issue of whether or not the values are invariant of time. Some assumed that technical inefficiency effects are time-invariant,

$$U_{it} = U_i, i = 1, 2 \dots N; t = 1, 2 \dots T. \quad (3)$$

The assumption of constant efficiency over time presumes that weaknesses that are attributable to firms themselves are inherently persistent in their very nature and their impact is invariant with time. However, assuming firms to be time-irresponsive in their mode of organization and inputs utilization is not usually practical. Battese and et al (1998) defined technical inefficiency effects as a function of time. The relationship is expressed as:

$$U_{it} = \{ \exp [-\eta (t-T)] \} U_i, i = 1, 2 \dots N; 1, 2 \dots T; \quad (4)$$

U_i are assumed to be iid as the generalized truncated normal random variable, $N(\mu, \sigma_u^2)$.

The random variable U_i can be considered as technical inefficiency effects for i^{th} firm in the last period of the panel. Technical inefficiency effects of the firm for earlier

⁵ This is a measure of the extent to which a certain firm operates below the frontier drawn by the most efficient firm among the sample firms given similar working conditions and nature of input use. Alike measures such as designed capacity of machinery, the model does not set internationally accepted technically attainable maximum level of output to make an inter country comparison possible.

periods are assumed to be the product of technical inefficiency effect of the last period and the value of the exponential function, $\exp [-\eta (t-T)]$. If the parameter η has a value more than zero, then $-\eta (t-T)$ would be greater than zero and the exponential function provides a value not less than one. In such cases, technical inefficiency effects in earlier periods would outweigh what could the situation be during the last period of the panel, $U_{it} > U_i$. If the value of $\eta = 0$, technical inefficiency effects of i^{th} firm do not vary over time, $U_{it} = U_i$ and if $\eta < 0$, then $U_{it} < U_i$ [Ibid, 1998], implying technical efficiency declines over time.

The production technology representing medium and large-scale leather industries during the period 1996/97 – 1998/99 could be either Cob-Dougllass or Translog stochastic frontier production function as represented in equation (2.5) and (2.6) respectively.

$$y_{it} = \beta_0 + \sum_{j=1}^3 \beta_j x_{jit} + v_{it} - u_{it}, \quad (5)$$

$$y_{it} = \beta_0 + \sum_{j=1}^3 \beta_j x_{jit} + \sum_{J < k} \sum_{j < k=1}^2 \beta_{jk} x_{jit} x_{kit} + v_{it} - u_{it} \dots (2.6),$$

where $i = 1, 2, \dots, N$,

representing identity of firms (in our case $N=10$ for tanneries or 24 for shoe and other leather product processors), $t = 1, 2, 3$ or 4, representing the time period and $j = 1, 2, 3$, identifying explanatory variables. Variables, y_{it} and x_{jit} denote log of output and factor inputs respectively.

Assuming time variant technical inefficiency effect, U_{it} s are non-negative random variables as defined in equation (2.4) and the probability distributions of both v_{it} and u_{it} are as described above. $\beta_s, \eta, \mu, \sigma^2, \sigma_v^2$ and σ_u^2 are parameters to be estimated.

2.2. Definition of variables

1. **Gross value of production (Y_{it}):** Output of a certain enterprise could be measured either in gross value of production or in terms of value added. Both measures have their own strength and weaknesses. Production is the result of the interplay of raw materials, fixed assets and other basic industrial costs and it is relatively less affected by measurement errors when calculated at the firm

level. Thus, considering gross value of production as measure of output and a dependent variable is found more reasonable. One needs to be cautious that the price of products could vary from one factory to the other due mainly to quality differences. This is mainly seen in the exporting and non-exporting firms. Thus, this paper takes different value of production among factories for similar quantity of output assuming that prices could capture quality differences.

2. **Industrial cost (X_{1it}):** Industrial cost includes raw materials, fuels, electricity and other supplies consumed and industrial services rendered by the firm.
3. **Wages and salaries (X_{2it}):** Labour is a heterogeneous input not only in terms of biological make-up but also in education, work experience and other similar attributes. Though not fully take into account, wages and salaries are presumed to consider such differences and better represent the extent of labour input use.
4. **Fixed capital (X_{3it}):** It represents those assets of enterprises with a productive life of one year or more. It shows the net book value at the beginning of the reference year plus new capital expenditure minus the value of sold and disposed machineries and equipment and depreciation during the reference year.

3. Empirical results

Descriptive statistics results

Tanning industries

The average firm level annual production, industrial cost and wages were Birr 45,425,390, Birr 31,394,530 and Birr 2,429,550 respectively for selected tanneries. In these industries, the average employed fixed capital was about Birr 9,963,869. Despite having similar machineries and equipment, there was a very wide difference in the level of production and the volume of variable and fixed inputs employed in tanneries.

Table 3.1: Descriptive statistics results on tanning industries ('000 birr)

Indicators	Output (Y_{it})	Industrial Cost (X_{1it})	Wages and Salaries (X_{2it})	Fixed Capital (X_{3it})
Mean	45425.39	31394.53	2429.55	9963.869
Max	133015	91271	7921	76652.05
Minimum	4199	1193	201	1401.653
Standard deviation	35206.65	24470.41	2417.694	15312.95

Relatively, a considerable number of tanneries (67.5 percent) were exporting their products. Contrary to the customary thinking, it was found no tangible evidence in terms of central and scatter variability measures that exporting firms were any better in scale of operation and productive use of resources. Table 3.2 below revealed that neither labour nor capital was more productive in exporting firms compared to inward-oriented industries.

Table 3.2: Comparative descriptive statistics for exporting and non-exporting tanneries ('000 Birr except the ratios)

Exporting Tannery Industries							
Indicators	Y_{it}	X_{1it}	X_{2it}	X_{3it}	Y_{it} / X_{2it}	Y_{it} / X_{3it}	X_{3it} / X_{2it}
Mean	44540.1	31872.7	2430.5	11195.9	18.33	3.98	4.61
Max	133015	87246	7921	76652.2	16.79	1.74	9.68
Min	6393	5080	231	1401.6	27.68	4.56	6.07
Standard Deviation	33541.0	23073.3	2496.3	17194.3	13.44	1.95	6.89
Non-Exporting Tannery Industries							
Indicators	Y_{it}	X_{1it}	X_{2it}	X_{3it}	Y_{it} / X_{2it}	Y_{it} / X_{3it}	X_{3it} / X_{2it}
Mean	48474.6	29747.6	2426.3	5720.1	19.98	8.47	2.36
Max	128536	91271	6033	10555.9	21.31	12.18	1.75
Min	4199	1193	201	2489.0	20.89	1.69	12.38
Standard Deviation	42548.4	30311.7	2264.3	2882.8	18.79	14.76	1.27

As it could be observed from Table 3.3, the value of output produced by one Birr worth of labour input has declined on average in both exporting and non-exporting firms though the rate was relatively higher in the latter case. Evidenced from capital labour ratio, exporting firms were relatively capital intensive and capital productivity was declining over time without any improvement in labour productivity. In the case of non-exporting firms, capital productivity was increasing though not commensurate enough to compensate the decline in output per one-Birr worth of labour.

Table 3.3: Partial productivity trends of tanneries

Indicators	1996	1997	1998	1999	Growth
Exporting Firms					
Y _{it} /X _{2it}	17.5	22.9	22.6	12.7	-0.16
Y _{it} /X _{3it}	11.4	6.5	3.4	2.4	-0.446
Non-Exporting Firms					
Y _{it} /X _{2it}	29.8	15.5	12.9	10.3	-0.28
Y _{it} /X _{3it}	7.1	11.9	9.9	8.0	0.11

The other probable cause for efficiency variation may be the size of enterprises and the consequential level of scale economies that they could possibly exploit. Apparently, there has not been any rule of thumb to level a firm into a certain scale. For the sake of this analysis, firms engaging 200 persons and more are considered large while others are labelled to be medium. According to this classification, numbers of tanneries categorized into the two scales are similar. Table 3.4 below demonstrated that mean value of production and inputs significantly varied between large and medium scale tanneries.

Table 3.4: Descriptive statistics for large and medium scale tanneries ('000 Birr except the ratios)

Indicators	Y _{it}	X _{1it}	X _{2it}	X _{3it}	Y _{it} / X _{2it}	Y _{it} / X _{3it}	X _{3it} / X _{2it}
Large scale tanneries							
Mean	65386.9	43566.5	4167.1	13113.7	16.9	9.3	5.5
Max	133015	91271	7921	76652.1	52.0	15.6	68.3
Min	17815	8744	1123	2489.02	7.8	0.76	0.8
Standard Deviation	38179.8	26601.6	2351.06	20867.5	9.7	4.7	14.9
Medium scale firms							
Mean	25463.9	19883.9	702	6829.8	50.7	5.2	10.6
Max	57210	50162	1194	17513.1	156.3	12.3	22.3
Min	4199	1193	201	1401.7	5.1	0.53	1.7
Standard Deviation	15738.4	13939.0	348.6	4984.8	43.2	3.28	5.8

Medium scale industries are relatively capital intensive, even though the average value of fixed assets employed was less than 50 percent of their large-scale counterparts. Perhaps due to this factor, large-scale industries were more productive in the use of their capital resource where as labour productivity was considerably high in medium scale tanneries. Of the total number of large scale enterprises, about 75 percent were exporters, while only 41 percent of medium scale industries were able to penetrate the international market.

3.1.2. Leather processing industries

The situation of shoe and other leather product processors was more erratic compared to what was the case in tanneries during the study period. Often than not,

a firm reported to operate in a certain year might not proceed in its operation in the subsequent one or two years. Accordingly, establishments, which managed to operate in successive years without interruption, were relatively very few compared to the total number of firms found in the list of Central Statistical Authority at any given time.

Table 3.5: Descriptive results of shoe and other leather industries ('000 Birr)

Indicators	Y _{it}	X _{1it}	X _{2it}	X _{3it}
Mean	5764.58	3420.646	669.7	2330.3
Maximum	63044	38447	5503	14053.4
Minimum	137	74	10	20.4
Standard Deviation	10701.9	6441.9	1501.4	2537.1

The average firm level annual production, industrial cost, and wage bill paid were Birr 5,764,583, Birr 3,420,646, and Birr 669,667 respectively. These industries were, on the average, employed Birr 2,330,310 worth of fixed assets. There was, however, a significant disparity in the scale of operation and the amount of inputs utilized among these establishments⁶.

Table 3.6: Large and medium scale shoe and other leather processors: descriptive statistics ('000 birr except the ratios)

Indicators	Y _{it}	X _{1it}	X _{2it}	X _{3it}	Y _{it} / X _{2it}	Y _{it} / X _{3it}	X _{3it} / X _{2it}
Large scale industries							
Mean	24876.8	14711.9	3561.9	2758.2	8.5	14.8	2.78
Max	63044	38447	5503	5007.2	18.3	58.8	13.02
Min	3059	1841	341	8.5	2.8	0.69	0.196
Standard Deviation	15463.1	9450.60	1879.97	1400.5	4.4	15.8	4.4
Medium scale industries							
Mean	1942.15	1162.39	91.2	2244.7	37.4	2.6	37.98
Max	7524	6428	430	14053.4	413.9	30.0	312.8
Min	137	74	10	20.4	3.2	0.13	0.34
Standard Deviation	1884.46	1399.75	82.5	2706.2	56.7	4.71	48.7

⁶ In this industrial group, exporting firms were very few (3 out of 24 enterprises), and even these firms were not able to keep up their sales in a continuous basis. Thus, comparison of exporting and non-exporting firms could not be feasible.

The scale of operation of those enterprises engaging 200 persons and more was large as it could be demonstrated in terms of gross value of production and inputs use. As it was the case in tanneries, medium scale industries were relatively capital intensive. Regardless of being medium size, these enterprises employed machineries and equipment that worth almost a comparable value with large scale industries. As a result of this, labour was found significantly productive in these industries contrary to capital. Partial measures may not entail a conclusive indication whether large or medium scale shoe and other leather processors were more efficient in the use of their factors of production.

3.2. Econometric results

3.2.1. Functional form selection

Stochastic frontier Cobb-Douglas and Translog production functions are estimated through Coelli (1994), OLS and Maximum Likelihood Error Component Frontier estimation procedures and a likelihood ratio test is carried out to identify the underlined production technology that might better explain the operation of enterprises. The results of the log likelihood ratio test are presented in Table 3.7 below⁷.

Table 3.7: Functional form and estimation procedure selection tests

Type of Industrial	Log-likelihood ratio			
	Case 1 : Functional Form		χ^2_{cal}	$\chi^2_{(r), 0.95}$
	Cobb Douglas (H ₀)	Translog (H ₁)		
Tanneries	-7.08	-4.2	5.76	12.59
Shoe and Other leather industries	-30.96	-18.99	23.94	12.59*
	Case2: Estimation Procedure		χ^2_{cal}	$\chi^2_{(r), 0.95}$
	OLS	MLE		
	Tanneries	-10.46	-0.7078	6.66
Shoe and Leather Industries	-20.00	-18.99	2.01	5.99

⁷ The log likelihood ratio test is based on a comparison of two maximum-likelihood estimators, generated by maximizing the constrained and the unconstrained likelihood functions. The statistics is asymptotically equal to; $\chi^2_{cal} = -2\{\log [L(Y; \beta^c)] - \log [L(Y; \beta^u)]\}$.

In Case 1, a test is made to investigate whether Cobb-Douglas or Translog better represents the underlying production function of the industrial group. In Case 2, whether or not there is tangible inefficiency among firms during the period is examined. The null hypothesis for Case 1 is $H_0 = \beta_{11} = \beta_{22} = \beta_{33} = \beta_{12} = \dots = 0$ and the alternative hypothesis is, $H_1 = \beta_{11} \neq \beta_{22} \neq \beta_{33} \neq \beta_{12} = \dots \neq 0$. For Case 2, $H_0 = \mu = \gamma = 0$, implying there is no significant inefficiency difference among firms and the operation of the industry would be better characterized by OLS. The alternative hypothesis is, $H_1 = \mu \neq \gamma \neq 0$. We accept H_0 if $\chi^2_{cal} < \chi^2_{(r), 0.95}$, where (r) is the number of restrictions and the reverse could be the case for the alternative [Gourieroux, 2000].

According to the test, Cobb-Douglas stochastic frontier production specification is found to better represent the underlying state of art in tanneries where as Translog functional form better characterizes the operation of shoe and other leather product processors. On the other side, the test demonstrated that there was statistically valid technical efficiency difference among tanning industries. Shoe and other leather processing industries were operating more or less on a similar level of technical efficiency. The forthcoming analysis on tanning industries would, therefore, proceed on the basis of the selected functional and estimation procedure. With respect to leather processors, despite the fact that OLS better estimates the underlying production function, the η coefficient being statistically significant is a source of motivation for investigating whether the trend in technical inefficiency, though not meaningful in the very short run, has been worsening or not.

3.2.2. Tanning industries

As far as the focus of the study is mainly on analyzing technical efficiency differences among firms owing to firm specific factors, production function coefficients of the model are of secondary importance. Besides, the Battese and Coelli (1992) estimation procedure is such that it does not provide overall significant tests, such as the values for F-test and coefficient of determination for the OLS estimates. Nevertheless, OLS and Maximum likelihood estimates are presented together in Table 3.8 below, and the former provide the average responses of firms' output to a unit change in each of the inputs.

All explanatory variables came up with a priori expected sign, except that the coefficient for fixed capital variable is found to be insignificant. In a capital scarce country, one may not find it theoretically sound to observe a result of this sort. However, the extent of fixed capital use is highly influenced by the amount of variable

inputs employed. Majority of the firms were operating far below their technical capacity, reported values of production might not go proportional to their capacity. On the other side, a one percent change in labour and industrial cost could result a 0.12 percent and 0.67 percent change in output. Ignoring the insignificant coefficient for fixed capital, the summation of elasticity values for the two factors of production revealed that tanneries were operating in diminishing returns to scale. This goes in line with the technical efficiency figures to be seen in the forthcoming section.

Table 3.8: Cobb Douglas production function estimates

Coefficients	OLS		MLE	
	Coefficients	t-ratio	Coefficients	t-ratio
B ₀	2.403932	3.70728*	2.741695	3.13104*
X ₁	0.675247	9.75457*	0.650895	9.03383*
X ₂	0.123498	2.0494*	0.117528	2.01183*
X ₃	0.042875	0.629834	0.558556	0.68235
σ ²	0.109759	-	0.1023438	1.8725*
$\gamma = \sigma_u^2 / \sigma_v^2 + \sigma_u^2$	-	-	0.256968	0.985593
μ	-	-	0.321995	1.46997*
M	-	-	0.321995	1.46997*
η	-	-	-0.775502	-2.57117*
Log likelihood function	-10.461	-	-7.077976	

* Significant at 5 percent.

The value of the intercept term in the MLE estimation is higher than its OLS counterparts implying that the most efficient firm was operating over and above the average firms during the period. This indicates the existence of efficiency difference among the different tanneries. However, γ being statistically insignificant implies that the share of firm level inefficiency from the total output variation attributable to both internal and external factors was not that much significant. Tanning industries have been operating by about two-third of their capacity (CSA, 2001) and the impacts of external factors have their own significant contribution. These external factors may be related to government policies and regulations, the supply of electricity, water and other auxiliary inputs and infrastructural facilities. Limited access to capital for operation as well as extension and rehabilitation activities is also a constraint.

Above all, shortage of hides and skins due to low level of domestic livestock production, considerably high human consumption for traditional clothing, furnishing and handicrafts, low off-take rate and low recovery rate (damage) arising from the

process of flaying and preservation is a very serious problem. Moreover, the main source of raw materials being rural farmers, the hides usually come from older draft animals and therefore suffer from diseases, branding and scratches. The long marketing chain started primarily from the rural farmer to rural markets, small dealers and agents, urban traders and shed owners, big traders in the central market, Addis Ababa and finally to tanneries also causes for an escalating input cost and quality corrosion. Even though, the Ministry of Agriculture is delegated to implement national standards on raw hides and skins owing to its proximity to the source, it did not establish a tangible mechanism to carry out this activity [UNCTAD, 2000]. Smuggling of livestock to neighbouring countries has also greatly threatened the sub-sector from realizing its potential. About 23 percent of all medium and large-scale industries attributed raw materials shortage as their major constraint [CSA, 2001].

Equally important is the negative and statistically significant coefficient of η that reveals the existence of technical inefficiency among tanning industries, which was rising over time during the period. In 1996, the average technical efficiency deviation of firms from the most efficient enterprise was only 3.3 percent. The variation came to be apparent as time went on. In 1999, a 28 percent average deviation was observed and the trend became very alarming.

Table 3.9: Technical efficiency trend in tanning industry

Period	Mean Efficiency	Rate of Growth in percent
1996	0.967	-
1997	0.931	-3.79
1998	0.857	-7.95
1999	0.719	-16.06

During the four years period, the average technical efficiency of tanneries in general was about 87 percent. Thus, the influences of external factors being constant, identifying and accordingly alleviating firm specific constraints could have compensated the 13 percent shortfall in output. This was not, however, the case for all firms. The most inefficient firm was lagging behind by about 37 percent, thus demanding an extra effort. Most tanneries have been operating with old and obsolete equipments, with little rehabilitation and expansion activities. They also suffer from lack of proper management to institute waste disposal mechanisms and ensure quality both in the working environment and products as well as study ways of improving mode of operations in light of new states of arts and improve their competitiveness.

Table 3.10: Efficiency variation between groups of tanneries

Indicator	All Tanneries	Market Orientation		Scale	
		Exporting	Non-Exporting	Large	Medium
Mean	0.868	0.848	0.939	0.881	0.851
Max	0.980	0.977	0.980	0.980	0.970
Min	0.631	0.631	0.792	0.686	0.631
Standard Deviation	0.1021	0.1036	0.057	0.090	0.109

Penetration to the international market requires either a special privilege from importing countries or producing goods with the required quality and competitive price. Ironically, consistent with descriptive statistics results, econometric findings also reveal that exporting firms were found rather less efficient compared to those which either unable or totally gave up looking for the international market. However, they have been able to sustain supplying their products to the international market in the absence of subsidies. Possible explanations for the paradox are the following.

Roughly approximated through fixed capital wage ratio, exporting firms employed relatively modern machineries. This might have allowed them processing hides and skins that could qualify for the international market standards and accordingly get relatively higher prices as compared to what the local market could offer. Once they meet basic international standards and establish market access through various mechanisms including participation in trade fairs, use of internet, buyer contacts, etc, exporting firms have continued to benefit from the market due to natural superiority of Ethiopian leather. According to UNCTAD (2000), “the Ethiopian highland sheepskins estimated to comprise 70 percent of the total sheepskin production have international reputations for their unique natural substance of fineness, thickness, flexibility, strength and compactness of texture. They are very suitable for the production of high quality leather dress gowns, sports gloves and garments”.

Whatever, the degree of competition abroad, the alternative market might not be attractive for exporting firms. The kind of technologies and the level of processing are oriented to manufacture high-grade leather, whose effective demand may be very low in the local market. Export-oriented leather product processors, which could have been a good market for exporting tanneries, are very few in number and they may not have the capacity to constantly use superior quality tanned leather for the production of exportable articles.

Besides their own weakness, inefficient operation of exporting firms could be attributed to problems related to export facilitation. A study on Sub-Saharan African countries revealed that in addition to policy related constraints, transport costs exerted a severe negative impact on external trade performance. "Freight rates for African exports often are considerably higher than on similar goods originating in other countries, and these charges generally conceal very high rates of effective protection for processed goods, a point that significantly reduces incentives for new investment in export oriented production activities" [World Bank, 1995]. The condition in Ethiopia could not be different, if not worse.

Inefficiencies are observed in relation to external trade movements. Long delays of vehicles and of exportable and imported goods, mainly due to time-consuming and lengthy processes result high transaction costs. Reduction of these costs could substantially benefit the sector in particular and the country in general [TFEDC, 2001]. Through this process, exporters could supply their products with competitive prices and import principal and auxiliary inputs at cheaper prices. In this effect, the application of improved logistics management system such as Electronic Data Interchange (EDI) scheme allows to effectively coordinate the activities of transport service providers, custom offices, insurance companies, port service providers and exporters. This is a practically proven mechanism, which has brought about a significant reduction in transaction costs and facilitating trade relations in many countries [World Bank, 1992].

It has also been observed that technical efficiency varies, to some extent, with firm size. Those establishments that engaged 200 and more persons were relatively efficient compared to medium ones. This might arise due to better opportunities to exploit economies of scale and minimize unit cost of production in large-scale industries. With size, large firms are likely also to have well-organized management system, market research units, better technical personnel and quality control sections.

3.2.3. Leather processing industries

From Table 3.11 below, it could be observed that except few including the intercept term, coefficients of factors of production, their squares and cross products are found statistically significant at 5 percent and 10 percent. Unlike the case of Cobb-Douglas specification, elasticities of factor inputs are not constant and easily explained⁸.

⁸ For instance, elasticity of labour (e_L) = $d\ln(Y)/d\ln(X_2) = \beta_{22} + (\ln X_2) + \beta_{12}(\ln X_1) + \beta_{13}(\ln X_3)$. Thus, elasticities of output with respect to changes in labour depends on the level of labour input, fixed capital

Table 3.11: Translog production function estimates

Coefficients	OLS		MLE	
	Coefficients	t-ratio	Coefficients	t-ratio
β_0	-1.830817	-1.2582	-1.777742	-1.80768*
X_1	0.9945053	3.20557*	1.000555	1.444629**
X_2	0.4588151	1.80012*	0.487280	0.683805
X_3	0.4263999	2.09824*	0.402057	1.631284**
$(X_1)^2$	0.9005223	2.80295*	0.107196	1.825239*
$(X_2)^2$	0.0424758	1.74916**	0.05958	2.126716*
$(X_3)^2$	0.0314722	1.87055*	0.037486	1.93068*
$(X_{1t} * X_{2t})$	-0.1202342	-2.71211*	-0.153627	-2.79126*
$(X_{1t} * X_{3t})$	-0.1308514	-4.01417*	-0.143813	-4.24689*
$(X_{2t} * X_{3t})$	0.22604089	0.561654	-0.029678	0.557109
σ^2	0.09915169	---	0.0918087	6.305468*
$\gamma = \sigma_u^2 / \sigma_v^2 + \sigma_u^2$	--	---	0.0449567	1.208066
M	--	---	0.128490	1.773774*
η	--	---	-0.345856	-1.953943*
Log likelihood function	-20.005045	---	-18.99187	---

* Significant at 5%. ** Significant at 10 percent.

As it was demonstrated above, OLS better estimates the kind of production function representing the operation of shoe and other leather product processors. Under capacity utilization, financial loss and entire bankruptcy of firms in this sub-sector is largely explained by external factors than internal firm level weaknesses. Through illicit trade in the form of dumping, contraband and under-invoicing, the domestic market has been flooded mainly with imitation and synthetic products that substitute locally manufactured genuine leather products including shoes, garments and other articles. This could be observed clearly along the streets of Addis Ababa and in almost all urban centres of the country. Lack of technical support with respect to technology choice, access to finance and market information put these enterprises in a disadvantageous position compared to competing East Asian firms.

and industrial cost which vary along each firm. Under conditions of perfect competition, elasticities of output with respect to each input are assumed to be equal to the shares of expenditure on the respective factor inputs in total output. This could not be practical at least in the Ethiopian situation where markets are highly distorted by illegal operation, information asymmetry and other physical institutional factors. The negative coefficients for cross products indicate the possibility of factor substitution

Government has established an institute to train on leather processing but the effect has not been yet meaningfully observed in terms of unit cost and quality improvements. The Quality Standard Authority of Ethiopia is responsible to implement standards and help instituting ISO 9000, an integrated management system that could ensure quality and thus competitiveness of leather products in a sustainable manner. Even though, new developments might take place recently, very few enterprises knew the existence of this Authority while UNCTAD was conducting a study in the year 2000. For the wide spread contraband trade, government bodies are accountable for their, among others, uncoordinated and less effective control. Among others, Quality Standard Authority of Ethiopia could have seriously inspected the quality of legally and illegal imports that have unfairly derived out local firms. While it requires time to comment as to its sustainable operation, currently Government through Ministry of Revenue has taken measures to manage contraband trade before it becomes out of control.

Even though, the external environment was not conducive, firms themselves were partly responsible for their failure. The intercept term reported in the OLS is lower than the case in MLE implying, with limited statistical validity, two different production functions are observed in the system; the average representing the majority and the frontier depicting the most efficient firm. Thus, the average lies underneath the frontier. This is an indication of technical efficiency variation among firms. However, the difference between the most efficient and inefficient firms during a period of four years and among 24 enterprises was only about 15 percent. The mean technical efficiency was about 92 percent, which was only 8 percent lower than the frontier level of output. Size did not contribute for technical efficiency variation. Large and medium scale industries were operating in a comparable level of efficiency.

Table 3.12: Efficiency difference between groups of firms

Indicators	All Firms	Large scale firms	Medium scale firms
Mean	0.918	0.920	0.918
Max	0.966	0.956	0.966
Min	0.852	0.874	0.853
Standard Deviation	0.030	0.028	0.031

The coefficient of η is negative and statistically significant at 5 percent. This indicates that technical efficiency of firms tended to decline over time. In 1996, the average technical efficiency was about 95 percent. This has declined at an increasing rate and reached to 88 percent, demonstrating how firms has been losing ground to

withstand the severe external constraints owing to deterioration of their internal managerial, technical and market searching capabilities. As a result, not only those enterprises that were able to export their products to the international market have failed to persistently do so, but also many firms became out of the domestic market in a sub-sector where the country is thought to have a comparative advantage.

Table 3.13: Mean technical efficiency over time

Year	Technical Efficiency	Growth Rate in Percent
1996	0.954	-
1997	0.935	-1.9
1998	0.909	-2.71
1999	0.87	-3.78

Poor design and finishing capabilities, lack of skilled manpower, use of back ward machineries, failure to use modern communication facilities, weak reaction in response to competitive products and weak international exposure are firm level, so to say, constraints hindering the performance of this sub-group. According to UNCTAD (2000), none of the leather processor companies had ISO 9000 in place, implying that the attempt to fulfil international standards is very limited. These precarious conditions may bring firms into a vicious circle where the prevailing under utilization of capacities or factor inputs would further enhance unit cost of production and exasperatedly weaken their fragile competitiveness and financial position.

4. Conclusion

Leather industry accounts the bulk of manufacturing export earnings. However, the performance of the industry has not been adequate given the huge livestock resources of the country. Leather processing industries in particular are under severe threat even in the domestic market owing to both external factors and firm level weaknesses. The objective of this study was to examine whether or not there was technical efficiency difference among leather industries in general, exporting and non-exporting, and large and medium scale industries in particular. The total numbers of tanneries and leather processing industries considered in the study were 10 tanneries and 24 leather processor. A stochastic frontier Cobb-Douglas and Translog production functions were estimated separately for these two groups of industries for the period 1996-1999. OLS and Maximum Likelihood Error Component Frontier

estimation procedures of Coelli (1994) were applied to generate technical efficiency values.

Log likelihood test revealed that Cobb-Douglas stochastic frontier production function estimated through MLE better characterize the underlying production technology of tanneries. Mean technical efficiency of tanneries for the whole period was about 83 percent. The influences of external factors being constant, addressing firm level weaknesses could allow compensating the 17 percent production shortfall observed. Contrary to the widely held view, exporting firms were not found to be efficient as compared to inward-oriented firms. However, exporters were using capital intensive technologies, which might have allowed them producing exportable quality goods. Larger firms were more efficient as compared to medium scale industries, because of the advantage of scale economies. Over all, technical efficiency of tanning industries was alarmingly declining, partly due to shortages of raw materials, use of morbid machineries, and weaknesses to productively utilize the prevailing state of the art.

Translog production function, estimated through OLS, is selected to better portray the operation of leather processors. This indicates the non-existence of statistically valid technical efficiency differences amongst selected leather processing industries. Nevertheless, the sub-sector has been performing significantly below capacity. According to the econometric result, this could be explained largely by external factors such as unfair competition with illegal imports, lack of easier access to finance, lack of technical support in the areas of technology choice, market information and similar other areas. In spite of its statistical validity, the increasing trend of inefficiency might reflect that firms have been losing ground to withstand the competition with foreign firms due to their internal problems. Some of these problems might include poor product design, use of backward machineries, weak international exposure and weak reaction to competitive products.

High transaction costs of export trade resulting from transportation delays, weak information flow and coordination among exporters and service providing agencies including customs administration, insurance and transport operators seriously affect the competitiveness status of tanneries in the external market. Besides their internal weaknesses, the inability of concerned bodies to control quality standards of similar imported products and ensuring fairly competitive market environment make the survival of leather processing industries at stake.

Thus, both government and enterprises are required to work hard in their respective areas to address these constraints. In the period of globalization, once the country has gone long distance with the liberalization derive, there may not be a room to unleash the gear. Thus, enterprises should accustom themselves with the changing environment and search ways to address their weaknesses. Government can play its supportive role within the framework of free market. The intervention is required, among other things, by way of controlling illegal and unfair practices, extending technical support in availing market information, training, technology choice, and in similar other areas.

The recent interventions, both in controlling illegal trade and promoting exports, seem to indicate that government has wake-up, and tries to rescue the industrial sector in general and the leather industry in particular. It is a commendable move that should be pursued in a well-integrated and coordinated manner. In addition, facilitating external trade by way of establishing electronically driven information system that facilitate coordination of the services of custom, insurance, transport and all others should be considered. Efforts of enterprises, government and other stakeholders should be synchronized to address the stated constraints to bring about sustainable improvement and development to the sector and the country at large.

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