PROTECTION ACROSS STEEL AND STEEL RELATED INDUSTRIES IN KENYA

BY

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DEDICATION:

This research paper is dedicated to my wife Eclay Namuma.

This Research Paper is my original work and has not been presented for a degree in another University.

Date.....

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This Research Paper has been submitted for examination with our approval as University Supervisors.

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ABSTRACT

This research examines the extent to which the impact of the structure of protection on relative resource pulls, manifested as defensive over-investment among the wire products firms. This occurred in response to the cancelling or offsetting effects inherent in the protectionist regime. A package of incentives for wire products are offset by the incentives for the wire drawing firms. This inconsistency in the design and implementation of the package of industrial incentives is responsible for unnecessary capacity building which is a waste for Kenya. The structure of protection by and large is an outcome of the manipulation of the institutions for protection by manufacturers and the degree of inefficiency in the performance and poor coordination of the institutions. Failure to control monopolistic practices, redundant investments and guide this vital industry in desired direction is a reflection of the weaknesses of the institutional framework.

This paper assesses the justifications for manufacturers' demands for further increase in nominal protection and presents a relevant criteria for assessing such demands. Lack of a clear vision of a rational criteria for tariff restructuring and rationalization will continue to provide incentives for further lopsided development of this vital industry.

CHAPTER ONE

INTRODUCTION

1.1 Background

The per capita consumption of iron and steel is considered to be a good measure of the level of industrial development of a country as iron and steel are the major inputs for most of the engineering industries. They are also suppliers of essential inputs which are crucial for the development of all other sectors (Gill 1981). Metal and engineering industries provide the base for all technological and industrial development. The contribution made by this sub-sector to Kenya's industrial GDP in 1991 is about 22.07 %. Its contribution to industrial employment is 23.06 %. This sector is only therefore next to the food industries sub-sector in its importance to the national economy.

The contribution of this sub-sector to manufacturing value added rose from 6.5 % in 1976 to a peak 7.1 % in 1977 and again in 1980. Since 1980 it has declined steadily to 4.1 % in 1985 (World Bank 1987) . The main decline seems to have come from the basic metals industries which include steel melting plants, bar rolling, wire rod milling , cold rolling mills, sheet galvanizing and tinning plants. These currently operate at very low levels of capacity utilization.

Kenya has developed a fairly good metal engineering base compared to the other African countries. She has gone much beyond the simple stages of import substitution in steel and steel related

industries. The industry has already reached a level of development, with increased share of local participation in the design, construction, fabrication and installation of capital equipment with adequate capacity for services and supporting infrastructure (Gill 1985). It has now ventured into machine building and automobile industry as well.

But like many other industries, these are underutilized and overcapitalized resulting into much waste and inefficiency as discussed in chapter two. This impedes further import substitution. Excessive tariff protection, complete lack of governmental guidance for the growth of this industry and failure to control monopolistic practices are much to blame for this situation[1] . This is explicitly evident in the wire drawing and wire products firms during the 1980's. Due to this situation, one wire drawing firm was able to charge higher prices above cif import prices inclusive of tariffs, whereas wire users could not take advantage of quantitative restrictions or higher tariffs on imports, rendering them partially ineffective.

Furthermore the very high effective rates of protection and occasional quantitative restrictions favouring some industries encouraged defensive investments in some branches of the steel industry particularly nail, copper winding wire, wire galvanizing and steel smelting manufacturing. Firms in these activities integrated backwards in the 1980's to draw wire and wire rods from imported wire rods and billets
respectively.

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[1] See Coughlin and Ikiara (1991): pp 240.

Inspite of sufficient installed capacity to produce domestically most wire products and the raw materials besides pig iron and the coking coal, the country still spends scarce foreign exchange towards the importation of these products as will be shown in chapter two.

The development of steel industry in some countries is the responsibility of the government, and in some countries it is left to the private sector. But the majority of the developing countries favour a mixed economy, where the system permits private enterprises in mini-steel plants while integrated steel plants are left to the public sector. The Government of Kenya supports this industry by way of tariff protection, liberal import licensing and foreign exchange allocation, tax holidays, subsidization of power costs, credit provision preference and export subsidies . However support given by way of export compensation to some products in the industry discriminates against some of them as shown in Table 1.

Table 1. Effective rate of export promotion[2]. (percentages)

	Import content excl. duties	Weighted aver. duty on imported inputs	Export compen ation rate		Effective rate of export promotion	
			1984	1985	1984	1985
	(1)	(2)	(3)	(4)	(5)	(6)
Wire rods	0.90	0.225	15%	20%	-83	-36
CRCs	0.88	0.176	15	20	-28	11
Galvanized sheets	0.57	0.14	15	20	-9	9
Cables and conductors	0.723	0.235	15	20	7	11

The effective rate of export compensation (R) is obtained by this formula:

$$\frac{\text{Col (4) - Col(1) - \{ Col(1) . Col (2) \}}}{\text{1.0 - Col (1)}} = \frac{\text{Net impact of fiscal Policies}}{\text{Value added exl. duties}}$$

Source: Coughlin and Ikiara (1991): Kenya's Industrialization Dilemma.

[2] Ibid pp 276.

1.2 Statement Of the Research Problem

In the early 1980's, there were about 30 wire products manufacturers and wire drawing firms in the country. The wire products firms used the wire drawing firm's output as their inputs. The wire drawers used imported billets to draw wire from. There was an anomaly in duty structure between wire rods and billets. The import duty on wire rods was much higher than that on billets. As a result, local wire products manufacturers had to use the expensive wire rod from highly protected local wire drawing firms, or, integrate backwards by investing in wire drawing machinery. And nearly all wire products manufacturers integrated backwards. This defensive investment has created excess capacity than required to sustain the industry.

As a result firms in the industry operate far below full capacity. One possible reason why wire products firms invested in wire drawing machinery could be negative effective rate of protection they received, resulting from high nominal rate of protection on wire drawing firms.

Hence shifts in the level of protection from wire products firms to wire drawers, led to excessive defensive investment among the former firms.

Most of the wire drawing firms are integrated forward, producing similar wire products like their customers. They have been able to outcompete the wire producers through underpricing, because

of their monopoly in production of wire. This has been the basis of the wire products' manufacturers argument to have the duty on wire rods lowered. The government has been resisting attempts by these firms to have the duty lowered, arguing that, already sufficient capacity to produce the raw material exist.

On the other hand, the wire products firms are accorded very high nominal rate of tariff on competing imported products, to supposedly protect them. However, this is eroded (or shifted) by high cost of imported material inputs brought about by high nominal tariff on them.

1.3 Objectives of the Study:

The study aims to estimate the effects of shifting of protection from wire products firms to wire drawing firms.

It will:

(a) analyze the effects of tariffs and capacity utilization on the protection of wire and wire product firms.

(b) determine the relative significance of each determinant in (a) in affecting shifting of protection in the industry.

(b) on the basis of (a) and (b) above suggest suitable criteria of rationalization of the protective regime with a view to correcting certain anomalies that promote unnecessary defensive

investment leading to excess capacity in some branches of the industry.

1.4. Significance of the Study

The government is restructuring the tariff regime, reducing slowly over-reliance on quantitative restrictions like import licensing, quota restrictions and direct bans. Tariffs also are being reduced gradually to make them uniform across all products, as part of the Structural Adjustment Programme (SAP)[3]. This is partly in response to inefficiency in the sector caused by duty anomaly among some products.

The success of the rationalization measures will, depend on understanding the extent to which the said anomalies contribute to inefficiency across the firms. Without this vital information such measures will be self-defeating. This study aims to fill in this gap by conducting an econometric estimation with the view to estimating the impact of duty anomalies on shifting protection across the sub-sector.

1.5 Organization of the Paper

The paper is organized into six chapters as follows. Chapter 2 discusses very briefly the position of the wire and wire products industry in Kenya, and the nature of the protection environment in Kenya. The chapter highlights the raw material availability,

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[3] See budget speeches for financial years 1986/87- 1990/91.

the steel smelting and rolling capacities installed; imports, production and consumption of steel products; projections of demand for and supply of flat and non-flat steel products to the year 2000 A.D, and the extent to which the protection environment in Kenya has shaped the structure of this industry.

Chapter three surveys the empirical literature on the status of the development of the iron and steel industry in Asia, Africa, Middle East, Latin America in general and in Kenya in particular. In the overview of the literature gaps, are identified to which this study intends to make a contribution. Chapter four discusses the research methodology and analytical framework. Chapter five analyses the results of regression and correlation analysis of the data collected on the sample firms in the steel industry.

In chapter six the paper outlines a summary of conclusions and recommendations.

CHAPTER TWO:

DESCRIPTION OF THE WIRE AND WIRE PRODUCTS INDUSTRY IN KENYA

2.1 Introduction

The iron and steel industry in Kenya today can be classified into four major categories depending on the type of products manufactured and the stages of production as follows;

(i) Steel re-smelting and hot rolling

(ii) Wire rod and wire drawing

(iii) Cold rolling and galvanizing

(iv) Foundries.

Most of the activities revolve around (ii) and (iii) above. In all there are 14 established firms doing the three activities excluding foundries.

Because of the non-existence of key raw materials for development of an integrated steel industry such as iron ore and coking coal, the existing processes are detailed in Annex figure 1 [4] . The present Kenyan steel mills are import substitution industries manufacturing flat and non-flat products from imported billets which are rolled after re-heating process. The other raw material is obtained from remelting scrap metal and casting into ingots which are then rolled into finished steel products. Kenya has sufficient capacity to manufacture these key raw materials.

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[4] This emphasizes the secondary nature of Kenya's steel industry. Kenya requires urgently an integrated steel mill to produce only billets and hot rolled coils.

The flat products include among others hot rolled coils, cold rolled coils, tin plate and non-flat products include wire rods, bars, angles, and sections. Though the country has sufficient capacity in non-flat products and its raw material, billets, the country still imports these products. Consumption of flat and non-flat products outstrips production in Kenya. The gap is filled by imports as shown in Table 2. Kenya has built sufficient capacity to manufacture these products, yet the country continues to spend scarce foreign exchange on importation of these products.

Table 2. Trends in consumption and importation of steel products

Tons '000

	1982	1983	1984	1985	1986	1987	1988
Consumption	115	198	210	350	242	380	
Imports	161	137	191	177	190	245	375
Non-flat			28.8	17.9	19.9	30.2	36.1
of which Wire rod				11.39	10.20	18.45	29.01
Flat products			95.7	75.9	68.9	86.9	99.0

Source: Government of Kenya, (1989) : Inter-Ministerial Committee Report on Bulk Importation of Iron and Steel

2.2 Wire Rod and Wire Drawing:

Steel billets are used as a raw material for the manufacture of wire rods. The latter is in turn used to make a variety of steel products ranging from metal fasteners (nails, rivets, bolts) to

barbed wire,chicken wire, nails and other fencing products. There are ten nail producers currently in production. Some ten others have ceased production. The first producer was Kenya United Steel Company, followed by Nalin Nail Works Ltd. Over the 1970's these two firms integrated backwards into wire rod drawing from billets. Since 1982, four other nail manufacturing firms have set up wire drawing facilities with the result that there is substantial excess capacity in the wire drawing and wire products manufacture.

Special Steel Mills, the only wire rod manufacturer has capacity to produce 75,000 metric tonnes. Special Steel Mills, however produces only 42,000 tons which is almost entirely used by its own downstream industries. The major users of wire rods have a total installed capacity of 27,360 metric tons as shown on Table 3.

Table 3.Installed Capacities For Nine Major Users of Wire Rods,1989

Firm	Installed Capacity	Location
1. Fehmi Nail Works	6,000	Mombasa
2.Flamingo Engineering Industries	600	Nakuru
3.Iron International Ltd.	2,400	Mombasa
4.Nalin Nail Works Ltd	10,800	Nairobi
5.Kenya United Steel Company Ltd.	2,400	Mombasa
6.Khetshi Dharamshi Ltd.	600	Nairobi

7.Sansora Wire & Nail Works Ltd	840	Kisii
8.Steel Reinforcements Ltd	720	Kikuyu
9.Wire Products Ltd	3,000	Nairobi
Total	27,360	

Source: Inter-Ministerial committee on Bulk Importation of Iron and Steel products, Government of Kenya (1989).

2.3 Steel Re-smelting and Hot Rolling:

There are five steel making plants in the country with a maximum liquid steel capacity of about 95,000 metric tonnes. The total rolling capacity in the country is about 239,000 metric tonnes operating at 35 % capacity utilization. In the Table 4 below, capacity for firms for which data on rolling or smelting was not available is equal to the difference between the total industry's installed capacity and the capacities of the firms for which data was available.

There are two categories of firms in this area namely integrated mills and non-integrated mills as shown in Table 4.
The integrated mills produce ingots/billets from scrap for their own captive use. The shortage of scrap locally limits the firms from selling to other users. These firms however, have extra capacity to supply others with ingots or modify and produce billets for other purposes but do not have enough local scrap for the purpose

The difference between liquid steel and rolling capacities is the major cause of some firms integrating backwards.

Table 4.

Liquid Steel and Rolling Installed Capacity in the Country.

Firm	Steel Smelting	(TPY)	Rolling	(TPY)
Kenya United Steel Co	Yes	12,000	Yes	12,000
Emco Steel works	Yes	25,000	Yes	25,000
Steel Rolling MIlls	No		Yes	42,000
Steel BIllet Castings	Yes	25,000	No	
Rolmill Kenya Ltd	Yes	15,000	Yes	18,000
Special Steel MIlls	No		Yes	60,000
Morris and Co Ltd			Yes	30,000
Steel Makers Ltd		NA		
Iron Africa Ltd.		NA		
Eldoret Steel MIlls		NA		
Total		95,000		239,000

Source: Gill 1985: Position of the Iron and Steel industry in Kenya.

2.4 Billets and Scrap Availability:

The billet[5] users in the country are the rolling mills and the

[5] A billet is a semi-finished steel short, thick bar of cylinder or rectangular prism produced from ingots. An ingot is a solid metal casting suitable for remelting or working.

only wire rod mill, Special Steel Mills at Ruiru. Steel Billet Castings was the only billet producer but went under receivership. It had one arc furnace and one strand continuous casting machine with achievable capacity of 25,000 tpy.

The country relies on local scrap and imported billets to produce various finished rolled products such as wire rods, angles, shapes, sections, e.t.c. Local scrap generation is estimated to be 35,000 tpy, compared to the estimated demand of billets which stands at 90,000 tpy in 1987. Table 5 shows imports of billets and steel scrap. The deficit could be made up by ship breaking, but unavailability of ships limits this feasible option. Also the closure of the only billet manufacturer has been attributed to duty anomaly in the protection regime.

Table 5. Imports of Billets and Steel Scrap (Tons)

Year	Billets	Steel Scrap
1984	24,703.4	2,432.2
1985	19,575.5	45
1986	39,090.2	6,707.9
1987	46,385.1	4,683.3
1988	52,612.5	435

Source: Annual Trade Reports (various years)

2.5. Projected Demand and Supply of Iron and Steel Production to the Year 2000 A.D.

Using extrapolation methods the demand for and supply of various finished steel products in the country was projected by Austroplan[6]. The figures are shown in Tables 6 and 7 below.

Table 6. Steel Demand Forecast: '000tpy

Year	Non-flat		Flat				
	Wire Rods	Bars&sections	HR[7]	CR[8]	Tin Plates	Others	Total
1978	29.3	74.0	41.0	67.4	20.3	0.9	232.9
1985	47.0	118.8	65.9	108.2	32.7	1.4	374.0
1990	66.0	166.7	92.5	151.7	45.9	1.8	524.6
1995	92.5	233.8	129.8	212.8	64.3	2.5	735.8
2000	130.0	328.0	182.0	298.0	90.0	3.5	1031.5

[6] This is an Austrian firm commissioned by the Government in 1980 to conduct the feasibility of starting an Integrated Steel plant.

[7] Hot rolled coils are raw materials for making cold rolled coils.

[8] Cold rolled coils are raw material used in making galvanized sheets.

Table 7. Domestic Supply '000tpy

Year	Non-flat		Flat				
	Wire rods	Bars & sections	HR	CR	Tin plate	Others	Total
1978	-	61.6	-	-	-	-	61.6
1985	47.0	118.8	-	50.0	30.0	-	245.8
1990	60.0	166.7	-	35.0	45.0	-	306.7
1995	60.0	213.0	-	16.0	64.0	-	353.0
2000	60.0	213.0	-	-	80.0	-	353.0

The balance (deficit) in the supply of these steel products is shown in Table 8.

Table 8. Balance (Deficit) '000tpy

Year	Non-flat		Flat				
	Wire rods	Bars &sections	HR	CR	Tin plate	Others	Total
1978	29.3	12.4	41.0	67.4	20.3	0.9	171.3
1985	-	-	65.9	58.2	2.7	1.4	128.2
1990	6.0	-	92.5	116.7	0.9	1.8	217.9
1995	32.6	20.8	129.8	196.8	0.3	2.5	382.8
2000	70.0	115.0	182.0	298.0	10.0	3.5	678.5

In 1995, the domestic supply of wire rods is expected to satisfy only 65 % of the demand. This is expected to decrease to 46 % in 2000 A.D taking into consideration growing population and projected figures of per capita steel consumption.

Conclusion:

The foregoing sections have elaborated issues highlighted in the background and statement of the research problem in chapter one. Issues such as under-utilization of capacity, defensive investment, duty anomalies, imports of steel products and overcapitalization have been brought out in detail. The purpose of this description is to provide a reader a survey of the industry, the achievements so far attained, shortcomings and their sources, the unexploited opportunities for further import substitution and problems that hinder exploitation of those opportunities. The study relies on data obtained from consultancy reports Government ministries and the University of Nairobi studies. The figures and the data are reliable.

The sections that follow describe the structure of protection pertaining to this industry and the extent to which the pattern of protection contributed to the lopsided development of this industry.

2.6 Protection of the Steel Industry In Kenya:

The steel industry in any country is regarded as a core and strategic industry. Its development has thus been nurtured by the state through state ownership and subsidization of private enterprises. The support the state accords this industry is in the form of infrastructure provision, tax holidays, remissions of duties on imported inputs, export compensation, liberal import licensing and foreign exchange allocation, high tariffs on competing imported products, wage guidelines and price controls.

Manufacturers are grouped in several lobby bodies such as Kenya Association of Manufacturers (KAM), Kenya National Chamber of Commerce and Industry (KNCCI) which make representations to the government on all protection measures inherent in the trade and industrial policies.

2.7 Institutional Framework:

The institutions in Kenya charged with the responsibility of administering and implementing the trade and industrial policies in the country are the Central Bank of Kenya, Ministries of Commerce, Industry, Finance, Agriculture, Planning and the Office of the President. These institutions constitute membership of two committees which administer and implement the protection measures. These committees are the Import Management Committee (IMC),and the Foreign Exchange Allocation Committee (FEAC). When the ministry of industry was created for the first time in

1979,the New Projects Committee (NPC) was created with the sole objective of approving new projects subject to approval of existing firms. The NPC in a way regulated the creation of unnecessary capacities. This committee was scraped in 1983 and replaced by the Investment Promotion Centre (IPC) in 1987.

Wage bills in Kenya constitute a big proportion of total costs of manufacturing. Trade unions representing workers and the Federation of Kenya Employers and the Government entered into Tripartite Agreements in the 1970s with the objective of preventing wage spiralling at the expense of employment creation. In furtherance of this objective, the government issues wage guidelines from time to time in consultation with employers through the Joint Industrial Consultative Committee (JICC)

Poor quality and high prices of Kenya's manufactured goods is the cause for preference for imported goods. Kenya Bureau of Standards (KBS) is charged with the responsibility of ensuring that industries produce goods which conform to established international standards. It ensures that factories install quality control equipment.

The structure of this industry is shaped by the environment in which these institutions operate. Some manufacturers and direct import wholesalers take advantage of the environment to circumvent government policy hence resulting in haphazard and disjointed development of the sector. Proliferation of small nail manufacturing and rolling mills even when those in the industry

operate at low capacity support this observation.[9]

Characteristics of the Environment:

The following characteristics inherent in the institutional framework have either been working against the efficient functioning of these institutions or influencing the gradual evolution of the environment over time[10].

(a) lack of clear vision of the country's priorities,

(b) inadequate staffing of skilled manpower in these institutions,

(c) imprecise delineation of terms of reference of the institutions resulting into duplication of duties,

(d) poor information dissemination on trends in the sector

(e) absence of a central co-ordinating agency both in the public sector and the private sector,

(f) imprecise definition of criteria for certain policies,

(g) crisis management tradition,

(h) anti-export bias.

Due to the above mentioned characteristics, capacity building in

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[9] See Coughlin, P (1985): The Kenyan Steel and Steel Related Industries: Programme for Domestic Reliance and Export Promotion. A monograph for the Industrial Research Project, University of Nairobi

[10] This include scrapping of some, harmonizing their functions, merging some and redefining the terms of reference of some.

consumer goods sector more than in the intermediate inputs sector occurred contrary to national industrial policy. Thus by 1972, the industrial sector had not changed significantly[11].

Wrong decisions and indecision due to lack of proper information and skilled manpower to analyze the impact of certain trade policies have been working against efforts by the government in strengthening the environment. Manufacturers do take advantage of these weaknesses and misinform these institutions. When policies are formulated on the basis of this information national priorities are compromised as a result.

2.8 The Protection Regime:

There are several policy instruments which the government uses to protect and promote industrialization in the country. These include among others quantitative restrictions, tariffs, duty remissions, export compensations, foreign exchange control, exchange rates management and investment allowances.

(a) Quantitative Restrictions.

Quantitative import controls have been more or less simultaneously applied together with tariffs both as an instrument of protection of locally manufactured goods from foreign competition, on the basis of the "infant"industry

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[11] See Table 3 pp 23 in Killick and Ikiara (1981): Papers on the Kenyan Economy.

argument, and or for promotional purposes to induce private investments, both foreign and local, and to stimulate the rate of import substitution. The main components of quantitative restrictions in the past and the present are as follows.

(i) The No-Objection Certificates

(ii) Import Licensing Schedules

(ii) Exchange Control Regulations

(i) The No-Objection Certificates:

The No-Objection Certificates were part of the elaborate licensing procedures which functioned to protect domestic industries in Kenya. The NOC system specified the name of the firm or firms, or sometimes an oligopolistic association of firms, that had to stamp and sign the import application before it could be officially considered. This system was introduced in the early 1970's merely to facilitate the tasks of the Department of Trade and Supplies- the task of banning the importation of products that competed with those produced by particular firm. The initial firms were Firestone and Pan African Paper Mills EA. The difficulty of knowing which sizes and grades of products were available from these firms and which were not, meant the department passed to them the decision as to which items should be banned and which should not (Hopcraft 1979).

Subsequently, however, the NOC became a mechanism by which protected firms developed tremendous market power, using it in

effect to outwit real or potential competing producers (Anyang' Nyongo' 1988).

The NOC were abolished in 1980 as part of the Structural Adjustment Programme. They were replaced by the import licensing schedules.

(ii) Import Licensing Schedules:

In Kenya there is a system of foreign exchange/import control administered by the Central Bank and an Import Management Committee (IMC).

Imports are managed for two purposes: (a) macro-management mainly for balance of payments and (b) protection for local industry. The system of foreign exchange allocation starts from projections of the balance of payments and the difference between the expected demand for imports and finance available by restricting imports through licensing. The present four import licensing schedules are a mere modification of the previous schedules. The most "essential" goods constituting raw materials and intermediate goods not made locally were placed on Open General Licence and would be imported freely. Goods manufactured locally but not in sufficient quantities or whose quality was not considered satisfactory or those not manufactured in all varieties could be imported under quota i.e., only a proportion

(50%) of the total imports of a given base year average could be allowed for importation, this proportion varying progressively according to the degree of import substitution (Atieno 1983) [12]. Import bans have been imposed on goods similar to those in which the country is self-sufficient.

Since 1982/83 import licensing was administered initially by way of five schedules, which were recently reduced to three as follows[13]:

Schedule 1: This schedule contains mainly high priority capital goods, raw materials and intermediate inputs with relatively few problems in identification or erroneous invoicing.

Schedule 2: This schedule contains those items of relatively high priority which require Ministerial or Government Agency approval prior to granting of a licence.

Schedule 3: Items in this schedule are further categorized into three groupings:

Schedule 3A: This category comprise commodities which are in many ways similar to those in Schedule 1 but also include some final goods which are subject to tariffs rather than administrative controls for protection. Several of these items exhibit problems of identification or erroneous invoicing which often delay granting of licence.

Schedule 3B: This category contains lower priority goods which should be able to compete with imports which enter relatively

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[12] See Atieno K.O: Proposed trade, tariffs and incentive policy for the implementation of the Fifth National Development Plan 1984-1988.

[13] See Sixth National Development Plan 1989-1993 pp 148-149.

freely subject to tariffs rather than controls. Some of the items require prior approval by a Ministry or Governmental Agency.

Schedule 3C: This category contains those items for which Government will continuously review the desirability of importation. Some of these items require prior approval by a ministry or Government Agency while others are either undesirable or are of such low priority as not to deserve allocation of scarce foreign exchange. Locally produced goods within this category may be strategic or those which would require a longer period of non-tariff protection before being exposed to tariff protection alone.

Table 9. Import Licensing Schedules for Steel Products

Item	1983	1985	1990
Billets	1B	1A	3A
Wire Rods of high carbon steel	1B	1A	
Nails including(roofing nails) of iron and steel	2B	2B	3A
Iron or Steel Wire of other alloy steel	2B	1A	3A
Wire rods of Stainless Steel		1B	

Source: Import Licensing schedules (various years), Ministry of Commerce.

From Table 9, billets, wire rods of various kinds and nails are placed in different schedules. The government is moving away from use of quantitative restrictions to tariffs in line with IMF Structural Adjustment Programmes. In the past the manufacturers

have lobbied for certain items to be shifted from one schedule to the other in order to improve their competitive edge over imported goods (Ng'eno 1984). The government has been responding favourably to industrialists' demands depending on availability of foreign exchange.

(b) Customs Tariffs:

This is the oldest form of protection that has been enjoyed by local manufacturers since independence, having been carried over from pre-independence years. During the early stages of development the rates of import duties were generally lower than at the later stages of industrialization. This is because up to around 1973 tariffs were imposed primarily to raise revenue with the protection of industries becoming a secondary motive.

Modes of Application of Customs Duties:

Import duties have been used in various modes for the protection and promotion of industries as follows:
High import duties have been imposed since independence to directly protect locally manufactured products from imported competing products. Products in this sector attracting more than 100 % tariff duty include sheets cut to size, nails, bolts, nuts, washers and other articles of precious metal.

Low import duties have been imposed on raw materials, intermediate goods and machinery which varied from 10-20 %

Refund or Remission of customs duties and sales tax (now VAT) on imported raw materials, intermediate inputs, and or machinery under the Local Industries (Refund of Customs Duties) Act of 1965 and the Customs Tariffs Act of 1972 have been another way of indirectly protecting local import-substituting industries through a subsidy. Although apparently originally intended to promote industrial development and indeed to form part of the package of incentives such as investment allowance and the Foreign Investment Protection Act, their role in effect, has been the same as that of imposed high (protective) tariff on imported competing products (Atieno 1983). As a matter of fact they have been more protective than promotional. Both measures were discontinued in 1980 as a part of Structural Adjustment Measures.

(c) Export Compensation Scheme:

The 10 % Export Compensation was introduced in 1975 under the Local Manufacturers (Export Compensation) Act. This scheme was intended to promote exports and accordingly the rate of export compensation was raised to 20 % in 1981. Under the scheme, specified manufactured goods having 30 % minimum local value added may be eligible for compensation at the above rate.

2.9 An Appraisal of The Trade Policy Instruments:

The following sections presents a brief overview of the perfomance of the two protection instruments and the institutional framework, highlighting the major shortcomings in their implementation in the past.

The structure of the tariffs, the manner of implementation of the policy instruments and a poorly co-ordinated institutional framework have contributed to the problems the sector is currently facing such as transfer pricing and capacity under-utilization. Defensive investment in wire galvanizing, steel smelting and rolling and nail manufacturing explain excess capacities existing in these branches (see Table 10). Much of these excess capacities arose because heavily protected monopolies or cartels charged high prices for unreliable supplies of inferior products e.g wire for nails[14].

To escape the clutches of these monopolies, some industrial customers initiated defensive investments in redundant capacity. On the other hand, the capacity to produce many currently imported items is idle or partly used due to government failure to have a timely and a vigorous policy to favour certain infant industries (Coughlin 1985).

(a) The structure of tariffs

High effective rates of protection and certain anomalies in the protection regime have contributed to creation of excess capacities and investments in redundant capacity.

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[14] See Coughlin, P (1985) pp 12-14.

Table 10: Capacity Utilization Rates in Selected Kenyan Industries in 1985:

Industry	Capacity utilization rates %
Cold-rolled steel	21
Hot rolled steel	22
Metal engineering	34
Steel billets	48
Steel sheet galvanizers	62
Steel pipes	13

Source: Coughlin and Ikiara (1988).

The nail and pipe industries illustrate this (Coughlin 1991: 254). In 1978, the tariff rate for nails was 33.3 % and for wire was 20 %. At international prices, the value added in converting wire to nails was only about 15 % of the cost of nails. Hence the effective rate of protection for Kenyan nail manufacturing firms was 109 %. Thus, Kenyan nail producers could be as half efficient as overseas producers and still survive the competition. In 1984, the tariff on nails was raised to 95 % and only 25 % on wire, thus ERP (492%) had risen. By late 1988,the government had reduced tariffs to 45 % and 20 % on wire, lowering ERP to 187 % still very high.

In this sector particularly nail making, wire galvanizing and cold rolling coils, concern has been raised about producers of intermediate inputs who also produce final products using these

inputs[15]. Many manufacturers complain that such producers raise the prices of inputs sold to their rivals so as to reduce their rivals competitiveness in the final products' markets. This has encouraged some firms to resort to unnecessary investments in the production of intermediate inputs as a defensive measure. Nearly all the nail making firms in the 1980s invested in wire drawing machinery. Wire Products Ltd installed wire galvanizing equipment in 1984. In 1982, Steel Reinforcements Ltd began drawing wires. Khetshi Dharamshi Ltd installed wire galvanizing equipment in 1984.

These investments were a waste for Kenya. In 1985, Khetshi Dharamshi Ltd had just imported new wire drawing machinery though both Kenya General Industries and Corrugated Steel Industries had idle wire drawing machinery.

Another illustration of how the tariff structure contributed to continued dependence on imported inputs despite existence of sufficient capacity is the case of billets. Kenya's only billet manufacturer, Steel Billet Castings Ltd went bankrupt in 1988, and its mother company Steel Rolling Mills collapsed in November 1989[16]. It was set to supply its mother company and if possible, other steel rollers. But since scrap steel was scarce, it could not fully supply steel rolling mills which therefore imported billets. To rectify the shortage, Steel Billets started in 1984 to import and break old ships for scrap for melting.

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[15] See Coughlin and Ikiara (1988) pp 246.

[16] Assets have been taken over by EMCO Ltd.

The customers of Kenya's only billet factory were local billet and ingots users,i.e. steel re-rollers and wire rod manufacturer. All of them felt there was an anomaly in the prevailing duty structure (Mukundan 1985a). The wire rod plant could have enabled the local billet factory to run at near full capacity thereby achieving economies of scale but wire rod manufacturers demanded duty on billets to be lowered and on wire rods to be raised, whereas the billet manufacturer wanted duty on billets to be raised.

Between 1985 and 1988, the PTA included wires and wire rods but excluded billets. Imported billets from any source paid 25 % import duty. In 1988 tariff on billets was reduced, regardless of source, to 10 % and on wire rods to 20 %. Thus output had a 25 % duty and the input, 10 %, though the landed cost ,including the 10 % tariff for Zimbabwe wire rods, was just a little below that of wire rods from other sources. This anomaly in the tariffs not only contributed to the collapse of the only billet manufacturer but also squeezed the local wire producer between costly inputs and cheap wire rods from Zimbabwe (Coughlin 1991:265).

(b) Export Compensation:

Until export compensation was increased, the scheme was utterly inadequate for stimulating steel exports. For every major steel product group, the net effect of import duties and export

compensation either discriminated against exports or was neutral (Coughlin 1991:274). A major weakness in the implementation of this scheme is that it was administered without much co-ordination with all other promotional measures (Atieno 1983). In particular the rate of export compensation did not take into account the relative increase in import duties on raw materials which tended to erode its benefits despite the increase in the rate of compensation.

Coughlin (1991) observed that:

" Before the increase in export compensation, the heaviest discrimination was against wire rods (83 %), and cold rolled steel (69 %) exports according to the rates of export compensation reportedly received by these industries[17]. The unrefunded portion of the duties on imported raw materials eliminated most of the international price difference between their finished products and imported raw materials. Since a manufacturer must export at internationally competitive prices, this discrimination largely frustrated efforts to export".

Similarly no suitable criteria were applied to determine the eligibility of goods for this incentive on economic grounds. Measures initiated to improve its incentive feature (e.g. graduating the rate of compensation according to the extent of local value added) were not enforced.

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[17] See Table 1 above.

(c) Institutional Structures:

Kenya pursued an import-substitution industrialization strategy which provided little incentives for manufacture of intermediate inputs, hence the sector is heavily dependent on imported inputs. Inspite of flexibility in the government in the issuance of import licences, importation of industrial raw materials in Kenya is anarchistic. Each manufacturer seeks his own source and overseas transport (Coughlin 1991). Companies do not shop around the world for cheap sources[18].

Since the steel sector imports heavily its raw materials, large bulk purchase and freight discounts and savings from more systematic shopping around are foregone. Absence of a single private local purchasing agent or trading house through which these imports could be channelled is missing. Transfer pricing on imported inputs for this industry is quite prevalent. For example Kaplinsky (1978) found that steel imports were overinvoiced by 5.9 %. Coughlin's recent research of company invoices corroborated Kaplinsky's conclusion about steel:
" A major firm in Kenya has been importing hot-rolled steel coils invoiced for US $ 315/t f.o.b from Japan while these were being sold for US $ 272/t to the US and discriminatively for US $ 227/t if sold to Southeast Asia. The c.i.f cost of a different size and quality of hot-rolled coils imported by five companies in 1985 varied 20.1 % between the most expensive and the least expensive.

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[18] Inter-ministerial committee on bulk importation of iron and steel recommended the establishment of a central purchasing agent to minimize the problem.

There were even significant variations of between 7.5 % and 15.4 % in f.o.b prices from the same country".

The government could monitor such a central purchasing agent and hinder transfer pricing more easily than with many buyers. Kenya could save about 13 % in bulk purchase and freight discounts off the c.i.f cost of imported steel if most steel imports were co-ordinated through a joint agent (Coughlin 1991)

The existing formal and previous institutions which have been administering and implementing the trade and industrial policy are the New Projects Committee, Industrial Protection Committee, the Central Bank, the Price Controller, the Import Management Committee, Central Tender Board and the Kenya Bureau of Standards. Briefly the limitations of these institutions were as follows:

(i) The NPC

The committee's effectiveness was limited by two factors. Firstly, it did not have enough qualified personnel to research or fully appraise projects brought to the committee. The committee was unable to evaluate highly technical projects . A second problem was political interference with the work of the committee.

(ii) The Central Bank of Kenya.

The bank possesses great potential for quickening the pace of

industrialization and influencing its pattern through the way it should influence foreign exchange allocation. The bank could adopt foreign exchange control and allocation policies to discriminate in favour of certain industries. But corruption among some middle level officers has hampered the effectiveness of the bank in pursuing this policy. Delays in approval of import licence and issuance of licences for the importation of luxury items are the cause of under-utilization of capacity in the sector. Such unnecessary delays in the issuance of licences is the major cause of manufacturers overstocking imports more than they require for their normal volume of production resulting into high costs. Some manufacturers argue that most of the bank's officials lack sufficient knowledge of Kenyan manufacturing sector (Ikiara 1988).

(iii) The Industrial Protection Committee

The IPC was one of the key inter- ministerial bodies set up in the 1960s as the main government agency for considering protection issues. In theory it was the only body responsible for issuing the NOC. The functions of this body were taken over by the Import Management Committee (IMC) which vets and approves import licence applications.

The method employed by the IPC left many loopholes which were exploited by politically influential or well placed individuals and firms. According to a World Bank report, " The IPC's policy recommendations were generally ad hoc responses to applications

from individual firms or groups of firms, for modifications in the existing structure of import tariffs duty drawbacks and import licensing. IPC did not ordinarily proceed on the basis of full information on the value of protection when recommending changes in duty remissions or reduction of quotas for competing products. It did not consider the resulting levels of effective protection (World Bank 1981)"[19].

[19] See World Bank (1981), Growth and Structural Change in Kenya: A basic Economic Report.

CHAPTER THREE

LITERATURE REVIEW

3.0 Introduction

This chapter reviews the empirical literature on the status of development of iron and steel in developing countries. The empirical literature reviews studies of UNIDO ,Coughlin, Mukundan, World Bank, Ministry of industry , Balassa and Greenaway and Milner.

The main objective of reviewing these empirical studies is to find to what extent the following themes have been articulated: Tariffs structure and its effects on resource pulls, shifts in protection across sectors, relationship between the level of economic development and the demand of steel products, the need for protecting the steel industry and the review of the protection regime.

These empirical studies reviewed will be evaluated within the context of the industrialization strategy adopted in case studies and in Kenya.

United Nations Industrial Development Organization (UNIDO)'s Sectoral Studies Branch and Research Division conducted studies on status of iron and steel industry in Asia, Africa, Latin America and Middle East. A few of these studies are reviewed.

3.1 UNIDO (1987) analyzed past developments, present situations, basic problems, future trends and prospects for the development

of the iron and steel industry in the ESCWA (Economic and Social Commission of Western Asia) region comprising the following countries: Arab Gulf States, Syria, Jordan, Lebanon, Egypt, Yemen Arab Republic and the People's Democratic Republic of Yemen.

The study noted that the pattern of industrialization in most countries of this region has not changed significantly since mid 1970 inspite of rapid growth of their economies. The manufacturing industry is still limited to light and consumer-oriented commodities. The imbalance in the structure of the manufacturing sector in the region is reflected in the limited contribution of fabricated metal products, machinery and equipment which was around 8.8 % of MVA.

The study highlighted the developments in total world iron and steel production, consumption and projected trends using econometric methods. Data used was time series annual data.The total region's production capacity of crude steel and finished iron and steel products was highlighted. The region's trends in consumption of finished steel products both flat and non-flat was also highlighted. The region's consumption in 1975 was 6.5 million tons; in 1982, it increased to reach 10.3 million tonnes, representing approximately double the amount in seven years. Approximately 80 % of the region's consumption came from imports, thereby showing the great dependency of the region on imports.

Regressing steel consumption per capita on GNP per capita, in three countries, Saudi Arabia, Egypt and Jordan, a practically

linear dependence between per capita steel consumption and increase in GNP was found to be positive.

Using the above methodology, a forecast of the demand for various iron and steel products was done to the year 2000 A.D and it was found that there will be a big gap between demand and installed capacities of the various finished steel products. UNIDO found also that current capacities in the region were working at 40-60 percent of their designed capacity owing to shortage of skilled manpower, workers' drain and instability, poor maintenance, lack of spare parts and inadequacy of raw materials to necessary specifications. The widening gap between demand and supply of iron and steel products was attributed to under-utilization of existing capacities.

The results of the regression analysis revealed the following. That the construction and infrastructural projects often increase the demand of non-flat products. Usually these sectors are active in the early stages of industrialization and this promotes the use of bars, light sections and galvanized roofing materials. The percentage distribution of demand of iron and steel in the developed countries was given indicating that the construction sector consumes very little percentage of steel products compared to the manufacturing sector. These countries have already passed all the other stages and are in the last stage in which the demand for steel has slackened.

It was noted that in this connection the region was reaching a

phase of gradual completion of these two sectors. Thus, in the not very far future the region might be facing a slow down in the internal market consumption of the basic steel products, unless intensive development of manufacturing downstream industries will be able to bring about a new impulse to demand of steel products.

3.2 UNIDO (1986) reviewed the developments of the steel sector in the ESCAP (Economic and Social Commission of Asia and Pacific) region. The major objective of the study was to provide a brief review of past developments, the present situation, basic problems and future trends and prospects of the iron and steel industry. The study covered the following countries: Afghanistan, Bangladesh, India, Indonesia, Iran, The Republic of Korea, Malaysia, Nepal, Pakistan, the Philippines, Singapore, Sri Lanka and Thailand.Though the level of development of this sector is poor in general, there were marked differences noticed in the level of economic development across the region. The functional relationship between economic development and steel demand was estimated using steel intensity (SI) curve. This S- shaped curve is defined as the ratio of apparent steel consumption to gross national product (AC/GNP). It was assumed that a change in steel intensity relative to a change in income is directly related to the level of income. Four stages of this curve were identified as follows:

(1) the stage of sharp upward sloping SI curve
(2) the stage of easy upward sloping curve
(3) the stage of horizontal SI curve

(4) the stage of downward sloping SI curve.

Using cross-sectional data steel intensity curve measured in Kg/$ was regressed on (GNP/Cap) measured in $ P.c, a good fit was found. The results are as follows:

SI = 0.1585 Log (GNP/Cap)

(Kg/$) -0.6991 (r = 0.9919)

At US $ 100 per capita GNP, there were differences in shifts in consumption of steel across these sample countries. In Korea it shifted from 0.15 Kg to 0.30 Kg; in Thailand,0.10 Kg to 0.17 Kg; in Indonesia it was at a low level of .05 Kg and in Philip

pines, the ratio of steel consumption and GNP was still at 0.07 Kg per dollar although the per capita GNP is as high as US $ 500.

From these results, it is clear that the demand for iron and steel has entered the stage of rapid growth while that of Indonesia and Philippines has not.

The relationship between economic development and the economic structure is proved in this study. Thus planning of the steel industry in developing countries should be well ahead of planning for the rest of the sectors. The study emphasized the importance of developing countries when projecting their demands for steel on a long term basis, to take into consideration the structural transformation of their economies. This is so because the stages of economic development are expected to have an effect on product

items of steel demand. This is the stage which Kenya is currently in.

The trends in crude steel production and consumption, steel consumption by sector and the share of flat iron and steel products in total steel consumption in all the countries was estimated. It was found that there was a gap between crude steel production and apparent consumption in terms of crude steel in all the countries above . The gap between demand for and supply of steel products and the widening gap between projected demand and production was attributed to lack of planning of the steel production ahead of the planning of the rest of the sectors. Every country which aspire to industrialize and maintain the pace of industrial development, must build its own heavy industry which constitutes a vital base which is necessary for rapid industrialization. The study noted serious obstacles developing countries face in establishing viable mini-steel integrated plants[20].

3.3 UNIDO (1985) study of mini-steel plants in developing countries found regional differences in the pattern of the use outputs of steel plants. In Africa 80 % of output was consumed by construction sector, 20 % by the construction sector and capital goods sector. In Asia 37 % was consumed in construction sector, 30 % in capital goods only and 10 % was consumed by pipes for water, gas and construction. In Latin America the rates were 17 %, 25 %, 8 % for construction, capital goods and pipes

[20] See pp 60-62 for study methodology.

respectively. The study found that problems facing mini-steel plants in developing countries can be classified into five main categories namely raw materials, energy, technology, financial and others. UNIDO recommended mini-steel plants as suitable to developing countries local capabilities and markets.

3.4 Balassa's (1977) study of the reform in developing countries found that the manner the developing countries applied policies to promote the import-substitution strategy had adverse effects on their exports. His study covered Mexico, Venezuela, Chile, Egypt, Portugal and Korea. The study was descriptive.

He noted that these countries experienced decline in their share of world market for primary products as the bias against them limited the rise in output. Apart from the bias against exports, the protective regimes employed lacked co-ordination. A variety of measures such as tariffs, prepayments requirements and import licensing were applied independently from each other. The system of protection which emerged was a historical result of actions taken at different times for balance of payments or in response to the demands of special interest groups.

He further noted that governments generally took a permissive attitude towards requests for protection and rarely enquired into the impact of the measures applied on other industries and on resource allocation in the whole economy. Little attention was given to the implications of protecting raw materials and intermediate inputs industries or the interaction of the exchange

rates and tariff policy. An optimal policy would require taking into account the interdependence of the measures as well as their effects on resource allocation.

3.5 In late 1980's, the Kenya Government in recognition of the importance of the steel sector in national development commissioned two studies to look into the problems facing the steel industry with a view to rationalizing the sector. An Inter-Ministerial Committee on Bulk Importation of Iron and Steel was set up in 1989 whose main specific objective was to enquire into the quality and the suitability of the imported materials and their pricing, the structure of the local steel industry and the associated problems with the view to proposing restructuring measures appropriate and relevant to the future development of this industry in Kenya.

The study identified four problems the sector faces as capacity under-utilization, monopoly structure, difficulties in importation of raw materials, poor standards and lack of quality control. The committee found that, even when operating at very low capacities, the companies still make some profits. Most of the firms operated between 20-60 % of the installed capacity. Secondly, most iron and steel manufacturers started backward integration, leading to formation of ugly monopolies in the industry. Such monopolies or cartels made it difficult for other manufacturers to survive. This particular area has already been a big problem to the extent of causing artificial shortages[21].

[21] An example of wire nails crisis in 1987.

Thirdly, the study noted that all manufacturers in the sector import the primary raw materials from any source at their own convenience.This has led to a very large variation in the prices of raw materials. Occasionally, small quantities of raw materials are imported at very high prices, and in the process unnecessarily drains the limited exchange available.
The growing gap between liquid steel capacity and the installed rolled capacity was attributed to old and outdated technologies[22],in the industry and are therefore unable to meet the required specifications.

3.6 Ministry of Industry (1988) conducted a study on the production of steel locally. The objective of the study was to recommend measures to rationalize the sector. The study reviewed the raw material availability, steel re-smelting and rolling capacities,projected demand for and supply of flat and non-flat products to the year 2000 A.D, prices of imported raw materials, suitability of technology for iron and steel industries in Kenya and standards in the industry.

The study's recommendations were tailored to improving efficiency, capacity utilization in the sector, supply of raw materials to downstream industries at low cost and

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[22] It was found that most mills were found to be wasteful in the billets reheat furnaces as they did not use recuperators and good burners. This investment could save about shs.6 million in production costs annually.

rationalization of the protective regime. The study noted that the factors behind the low capacity utilization characterizing the industry were over-investments by individual firms and duplication of capacities in the various activities by various firms. This resulted from defensive upward integrated firms which were not ready to buy from or sell to one another. Defensive investments resulted from rivalry among different firms as they tried to integrate backward out of the frustrations they got from their would be monopoly suppliers of raw materials, where the latter also owned downstream industries. The study noted that this over-investment had however been supported by the overprotected nature of the industry and the failure to control it which allowed firms to continue making profits even after operating the inefficient plants.

The study found anomalies in the protection regime with respect to iron and steel industry. It thus recommended appropriate duty structure on billets, wire rods and finished wire products including barbed wire, nails, screws, bolts, nuts, nail washers e.t.c[23].

The study recommended that effective rate of protection on most of the finished wire products mentioned above was already high even after the June 1988 finance bill. Most of them had protection over of 200%. The study recommended reduction of protection by manipulating duties on their products and their raw materials to encourage competitiveness in the local and

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[23] For details see pp 90-93.

international markets by promoting efficiency in their production.

3.7 Mukundan (1984) studied the Kenyan wire product sector with a view to:

(a) determining whether the prevailing customs duty tariffs provided adequate protection to the domestic manufacturers of wire rods, billets and wire products.

(b) assessing technical capability of the sole producers-the Special Steel Mills Ltd. and Steel Billet Castings Ltd., to meet domestic demand for wire rod and billet both in quantity and quality.

(c) estimating and comparing local cost of production of wire rods and billets with landed cost of imported wire rods and billets ,and foreign exchange savings in local production.

(d) recommending appropriate duty tariffs and other measures to balance these sectors for achieving a healthy competition without creating monopoly situation.

The study covered manufacturers of wire rod, wire products, scrap based mini-steel plants producing ingots and billets and rolling mills making hot rolled products. These firms felt that there was an anomaly in the prevailing duty structure. He evaluated the demands of the wire rod and billet producer to increase and lower duty on imported wire rods and billets respectively. He rejected their demands. He found that the imported billet with a duty of 25 % was already about Kshs. 900/t costlier than locally produced billet and this considerable difference was an adequate incentive for the local billet producer. Furthermore the landed cost of

wire rod was found to be higher than that of billets by 1404/t and this was found to work in favour of the wire rod producer.

3.8 World Bank (1987) reviewed the impact of trade incentives on the capacity utilization and efficiency in the basic metals industry in Kenya. The study estimated the efficiency of the industry at actual capacity utilization. The methodology the bank adopted was based on efficiency indicators such as domestic resource costs[24] and effective rates of protection. By assuming full availability of raw materials and no demand constraints, the estimates of the DRCs ratios were computed at projected attainable capacity based on information provided by sample firms.

The Bank's findings based on a sample of nine activities in the basic metals industry, found that both the short- and long run DRC ratios were found above 1.0, i.e 1.32 and 2.33 respectively. Individual results showed that 78 % of the generated value added pertained to inefficiency both in the short run and the long run, with the exception of one efficient activity non-standard spare parts which alone accounted for 11 percent value added due to a rather high share of the activity in the sub-sector's value added at world prices.

The nominal rates of protection on the following iron and steel

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[24] DRCs ratios indicates the net foreign exchange savings (or earnings) that domestic resources can generate in a particular in the activity. It is the ratio of domestic resources used in the activity, valued at international prices.

products were computed: cast iron products, non-standard products, nails, fencing products, steel rolled products, galvanized iron sheets, fasteners and mild steel billets. The Bank found that with respect to some products, protection was negative. On the whole negatively protected sample firms were found to be using more than 70 % of their installed capacity and firms enjoying high rates of protection were found to be using less than 30 % of their capacity. An inverse relationship was found between capacity utilization and efficiency. However the relationship with levels of protection was not found to be strong[25].

The haphazard structure of tariffs in the sector, mutual distrust among local manufacturers and a permissive, uncoordinated import policy by the government, interacted to create wastage of investment resources as well as high costs of production in the sector. The result the bank noted was the creation of excessive capacity in relation to feasible market size. To some extent this has been due to deliberate strategy to avoid dependency on local competition for critical inputs and to achieve benefits of vertical integration. However, it was evident that the investors miscalculated the extent of capacity creation and their own integration benefits.

3.9 Coughlin's (1991) study of the wire and wire products industry found that many products continue to be imported despite the existence of local capacity to produce them. He computed

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[25] For results see World Bank (1987) pp 64-65.

effective rates of protection for fasteners, screws, nails and refractories. Importation of these products despite sufficient capacity continues. He computed capacity utilization rates across the entire steel sector[26]. He also found that, in 1984 Kenya rolled 53,000 metric tonnes of steel though it could roll 264,000 t/p.a. and it made 21,000t/p.a. though it could make 162,000t/p.a. This was a massive waste of investment.

The manufacturers reported that the major reasons for failing to use their productive capacity fully were the inadequacy of demand for their products (71%) and difficulties in obtaining raw materials (67%). The inadequacy in demand was attributed to excessive investment in relation to small market.

Fundamental explanations for the massive over-investment in this industry were linked to governmental policies which failed to correct or control those drives. The government's poor control of ill effects of cartels and monopolies stimulated defensive over-investments. High protection for operations with value added often resulted in extremely high effective rates of protection.

3.10 Greenaway and Milner (1986) estimated the general and relative price effects of industrial and commercial policy in Mauritius. The objective of the study was to find the net relative price effects of policies which were applied simultaneously to protect against imports and promote exports. These policies included export subsidies, import duties and

[26] See Table 10 above.

quotas. To capture the shifted burden of protection onto exporters imposed by protection of import-substitution activities, they introduced in their model non-tradeables as their point of reference. They studied the chief traditional and non-traditional exports during the period 1976-82 and 1969-76. The former included tea and sugar and the latter included textiles. They derived a shift parameter which measured the implicit subsidy (tax) the exportable sector enjoyed (suffered) as a result of protecting the importable goods sector. In the model the degree of implicit subsidy (tax) was measured by the extent of the decline (rise) of the price of home goods relative to importables.The extent to which the rise in the relative price of importables taxes exportables depends on the extent of the rise in the price of home goods relative to exportables (ph/px). The greater this ratio, the greater the shifting of the initial burden on exporters.

Thus assuming initial price ratios are unity

$(Ph/Px) = w \quad (Pm/Px)$.....(1)

This was expressed in continuous terms as

$Ph - Px = w \quad (Pm-Px)$.....(2)

where denotes proportionate changes given in the time series price indices data on home goods (Ph), importables (Pm) and exportables (Px). Equation (2) was estimated in double logarithmic form as

$\text{Log } (Ph/Px) = a + b \text{ Log } (Pm/Px) + u$.....(3)

The estimated coefficient b provided an estimate of the shift

coefficient. Using OLS regression technique they found that between 49 % and 86 % of all interventions operated as an export tax depending on whether exportables were treated as traditional or non-traditional.

The model provided very important insights into the effects of industrial and commercial policy in Mauritius and elsewhere it was applied. An important interpretation of the derived coefficient is that any incentives provided to producers of manufacturers for export serve to offset in part the disincentives associated with import substitution. This implied that there were inconsistencies in the deployment of policy instruments in Mauritius.

The model is quite dynamic in that it can lend itself to further analysis enabling the derivation of "true" protection rates.

The principal data input of this study was the price index on importables, exportables and non-traded goods. A principal limitation of the use of such data is that it is difficult to isolate the marginal effects of tariffs, quotas and subsidies implicit in the shift coefficient derived. In such a situation it is difficult to draw relevant policy recommendations from such analysis.

Other similar studies were done in Argentina, Columbia, and Chile

by Sjaastad, Diaz and Clements respectively[27].

OVERVIEW OF LITERATURE

The broad international literature highlighted the gaps between crude steel production and consumption of finished steel products in the regions studied. Two sub-themes emerging from this theme are one, that planning of capacities in the secondary processing activities did not take into account availability of existing steel production capacity. UNIDO studies on ESCWA and ESCAP regions tried to bring out this link[28]. Two, the crude steel consumption deficit and the sectorwise consumption of crude steel have shaped the structure of the industry[29]. Studies on steel and steel related industries in Kenya highlighted the extent to which the tariff duty regime contributed to the problems the industry is currently facing.

These themes are fully and clearly addressed in the literature reviewed. Statistics on the trends in production, consumption of crude steel, finished steel products and imports of these products were analyzed for each region. Determinants of the gap between demand and supply of steel products were identified but evidence of the causal relationship between them were not brought

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[27] For results see Table 6 in UNIDO (1986): Industry and Development.

[28] The methodology used was linking demand of certain steel products and certain sectors.

[29] In Kenya this was manifested in firms integrating backwards.

out clearly.

The central theme emerging from these studies is underscored in my study though not very explicitly. This study seeks to investigate the extent to which shifts in protection levels across the steel sector are determined by anomalies in the protection regime and capacity utilization rates in the industry. My study recognizes that the domestic deficit in production of some steel products is brought about by under-utilization of the installed capacity, which is sufficient to meet domestic demand. In Kenyan situation this was manifested into integration both forward and backwards in some steel mills, producing products in which sufficient capacity already existed. The integrated firms tended to outbid the non-integrated firms through price cutting. This caused artificial shortages of critical raw materials thus widening the gap between demand for and supply of finished steel products.

Both the international and the Kenyan literature reviewed recognized the fact that Kenya and the other countries are entering stage two of the Steel Intensity curve mentioned in one of the studies. This is the stage in which the importance of iron and steel consumption is high in the manufacturing industry in their economies. Statistics on the sectoral consumption of iron and steel were given which indicated that the contribution of manufacturing was lower than the contribution of the construction sector in developing countries and the converse was true in the developed countries. Therefore against this background, the

pursuance of an export- oriented industrialization strategy which is being given emphasis in developing countries has little chances of success. On the other hand these countries could miss further opportunities of import-substitution if liberalization which goes with export-oriented industrialization strategy is implemented without caution.

These studies recommended measures to redress the situation. Instead of increasing capacities the studies recommended improved utilization of the existing capacities. But both of them fell short of putting forward a strong case for protecting the steel industry on the grounds that the role of construction sector is reducing as the developing countries enter the second stage and the slump in demand for steel in the developed countries.

The studies in terms of coverage of the wire and wire products industry were adequate. The methodology used was also adequate in so far as estimating the determinants of capacity utilization is concerned. But both studies fell short of highlighting the extend to which the duty anomaly contributed to under-utilization of capacity in the wire and wire products steel sector.

CHAPTER FOUR

ANALYTICAL FRAMEWORK AND STUDY METHODOLOGY

4.0 Analytical Framework:

This study is analyzed within the general equilibrium model of international trade theory on protection[30].The behavioral model for predicting the nature of resource pulls between protected industries based on the the theory of effective protection (ERP) is derived from this framework.In developing countries such as Kenya, factor and product prices, foreign exchange rates, and interest rates are distorted and do not reflect their true opportunity costs. It is for this reason that considerable effort has been spent on devising analytically satisfactory frameworks which at the same time are practically useful for the measurement of the opportunity cost of producing or saving foreign exchange as well as for the measurement of economic costs of various restrictive systems. Two schools of thought seemingly unrelated have developed in this field, that of domestic resource cost (DRC) and that of effective rate of protection measurement.

It is within this framework that assessment of industrialists' demands for further nominal protection can be assessed and general appraisal of the protectionist regime can also be done.

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[30] See Chacholiades M. (1990) PP 146-151

4.1 Definition of concepts:

(a) Domestic Resource Costs (DRC)

The DRC indicates the net foreign exchange savings (or earnings) that domestic resources can generate in a particular activity. It is the ratio of domestic resources used in an activity, valued at their opportunity cost, to the value added at international prices. It is algebraically defined as,

$$Bi = \frac{\sum_j Wj\ r_{ij}}{Pi - \sum_j Nj\ r_{ij}}$$

Where W is domestic resource costs (value added) at a given stage of fabrication,

Pi is the world market price of the commodity,

N is the value of imported inputs per unit of output,

r_{ij} is elements of the matrix of direct and indirect input requirements

The resulting ratios are compared to one. Thus, activities with the DRC ratio less than one are considered "efficient". Conversely, activities with the DRC ratios higher than one are classified as "inefficient", since the cost primary factors of production exceed the net benefit of saving or earning a unit of foreign exchange.

The relationship between this concept and the effective rate of protection (ERP) is that the DRC equals unity plus a weighted average of the effective rate of protection, the weights being the contribution of direct and indirect value added to output produced under free trade conditions. Whether trade incentives translates into economic inefficiency in the use of factors of

production can be ascertained by the DRC indicator.

(b) Tariff:

A tariff is a tax, or duty, levied on a commodity when it crosses a national boundary. The most common tariff is the import duty, that is imposed on an imported commodity. In general, taxes whether on imports or exports can be imposed in any one of the three forms, as follows

1. The ad valorem duty: This is tax, or duty, is legally specified as specific percentage of the value of the commodity imported or exported, inclusive of or exclusive of transport costs.

2. The specific duty: This tax is legally specified as a fixed sum of money per physical unit imported or exported.

3. This is a combination of an ad valorem tax and a specific tax.

The Effects on Domestic Prices:

The most obvious and direct effect of a tariff is on domestic prices. Developing countries being small, participate in international trade flows as price takers. Pricing policies in these countries are mainly import parity based. Tariffs drive a wedge between domestic prices and world prices.

In the general equilibrium model, a change in relative price in one sector has profound effects on the domestic organization of the economy of a small country. When the tax levying country is a small country, the tariff causes the price of the imported commodity to rise in the domestic market proportionally to the

tariff as indicated in this formula,

$PD = PW (1 + t)$

where PD is domestic price

PW is world price (cif)

t is nominal tariff duty.

The extent to which a tariff alters the cost of imported inputs relative to the domestic finished goods compared with the way it affects the price of domestically produced inputs relative to price of the finished products, indicates the true protection of the tariff and the extend of the shifting of the burden of protection onto the domestic manufacturers.

(c) Effective Rate of Protection:

Nominal rates of tariffs (published in a country's tariff schedules) often fail to measure the degree of protection actually received by domestic producers. This is because protection depends not only on the nominal rates imposed on the final product itself, but also on any taxes or subsidies placed on inputs. When an import-competing industry utilizes intermediate inputs imported from the rest of the world, the precise degree of protection is captured by the effective rate of protection accorded to value added in production, not nominal rate imposed on the finished product.

More generally, the effective rate of protection will be higher than, equal to, or lower than the rate of tariff on (export subsidy) on the product, depending on whether this tariff (export subsidy) exceeds, equals, or falls short of the average rate of

tariff on material inputs. Effective rates of protection will be negative if tariffs raise the cost of material inputs by a larger absolute amount than they raise the price of the product[31].

Nominal versus Effective rate of protection:

When a protected import-competing industry utilizes imported inputs that are themselves subject to duty, the nominal tariff rate does not convey the true level of protection that is provided to the domestic producers and that in the final analysis, affects resource allocation throughout the economy. The basic reason for this anomaly is the fact that nominal rates apply to the total value of imports, while the true value(which is relevant to domestic producers and resource allocation) applies only to the "value added" by domestic producers.

Relevance and applicability of this analytical framework to the problem being studied:

The government uses tariffs, quantitative restrictions, exchange rates, foreign exchange controls etc to influence the structure of protection levels across sectors. The rates of these instruments are uniformly applied across all the sectors. The partial equilibrium approach focuses only on the protected industry. Since protection effects reverberates beyond the sector in which the tariff is originally imposed, the general equilibrium approach can capture all the effects of a tariff. Assuming the primary level, the secondary level,and the tertiary level activities of the steel industry as distinct markets which

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[31] See Balassa, B. (1971) Chapter 1.

are closely related. A change in tariff in any one of the above activity, reverberates beyond the activity in which the change occurred.

Promotional and protectionist policy incentives for import-substitution and export -oriented industrialization strategies in Kenya are applied in different proportions. Various segments or branches of the steel industry can be classified either under the latter or the former. Tariffs and export compensation schemes are protectionist and promotional respectively. These policy incentives are applied simultaneously in Kenya. However the inconsistency in the application of these industrial and commercial policies as shown in the literature review leads to cancelling or offsetting effects which is evident in these interventions. This is the core matter of this study.

The general equilibrium model is a powerful tool capable of capturing the relative price effects of all interventions applied simultaneously across sectors. Focusing on relative prices across the steel sector, it is possible to infer something about the relative incentives across the sector's branches.

4.2 EMPIRICAL MODEL.

The study will adopt with modifications the model of Greenaway and Milner (1986), tested in Mauritius. Though the products for which the model was tested were not steel related, the model can be applied in testing shifting of protection across steel industries sector in Kenya.

One major reason for adopting this model is based on similarity between the bottomline of the objectives of the above cited study and this study. That Mauritius being a developing country like Kenya, and having adopted similar industrialization strategy initially, the policies and programmes used to further this strategy, were contradictory and conflicting. The result has been that inconsistencies in policies in both states not only impeded further import substitution but also contributed to missed export opportunities. Both states in the last decade have been restructuring their protection regimes with a view to promoting rapid industrialization and exports of non-traditional products such as the one being studied.

The modification made in the model adopted is with respect to variables chosen, their quantification taking into account the Kenyan data. In the reviewed model in the literature, the impact of trade policy incentives was reflected in price ratios measured in consumer price indices. Since this study was a time series analysis, the methodology was appropriate. However the plausibility of the results depend on the choice of the base year. This study will not use price indices to reflect changes

in prices resulting from application of trade policy incentives, but will carry out direct measurement of the impact of the incentives on shifts in the levels of protection across in the steel sector.

Model Specification:

ERP = f(X1, X2, X3, U)

Where ERP = Effective Rate of Protection

X1 = Nominal rate of tariff on final product

X2 = Average nominal rate of tariff on material inputs

X3 = Capacity utilization

U = Error term.

4.3. How the variables will be estimated.

(a) Effective Rate of Protection:

The effective rate of protection for the activity (see Table 11) j can be derived as follows[32],

Let

Vj = Value added per unit of j in activity j in absence of tariff;

Vj' = value added per unit of j in activity j made possible by the tariff structure;

gi = effective rate of protection for activity j;

Pj = price of a unit of j in absence of tariffs;

a_{ij} = share of i in cost of j in absence of tariffs;

Tj = tariff rate on j

Ti = tariff rate on i

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[32] See Corden (1966).

Then

$$Vj = Pj\ (1 - a_{ij}) \quad \ldots\ldots(1)$$

$$Vj' = Pj\ [\ (1 + Tj\ ) - a_{ij}\ (1 + Ti\ ) \quad \ldots\ldots(2)$$

$$g_i = \frac{Vj' - Vj}{Vj} \quad \ldots\ldots(3)$$

From equations (1), (2) and (3)

$$g_i = \frac{Tj - a_{ij}\ T\,i}{1 - a_{ij}} \quad \ldots\ldots(4)$$

This is a key formula, the implications of which can be summarized as follows.

If $Ti = Tj$, then $g_i = Ti = Tj$

$Tj > Ti$, then $g_i > Tj > Ti$

$Ti > Tj$, then $g_i < Tj < Ti$

If $Tj = 0$, then $g_i = -Ti\ a_{ij}/1 - a_{ij}$

If $Ti = 0$, then $g_i = Ti/1 - a_{ij}$

Thus $dg_i/dTi = 1/1 - a_{ij}$

$dg_i/dTj = -aij/1 - a_{ij}$

For many importable inputs into the j_{th} product (inputs 1,2,...n), but with no exportable or non-traded inputs it can be similarly be shown in equation (5) that,

$$g_i = \frac{Tj - \hat{\Sigma}\ a_{ij}\ Ti}{1 - \hat{\Sigma}\ a_{ij}} \quad \ldots\ldots(5)$$

Where j is wire / wire product,

i are imported inputs,

aij is import content (share of imported inputs in output value),

1 - Σ aij is value added.

The implications are the same as above except that in place of the single input tariff Ti, it is necessary to write the weighted average of input tariffs.

Table 11. Computations of Effective Rates of Protection on Wire and Wire Prod

Firm	Product	Value of Output (KSH)	Imported Material Inputs	Cif cost of Inputs (KSH)	Nominal Tariff Rate on product %	Tarif Duty on in (%)
A	Wire	56543045	wire rods	540405334	25	9.99
			powder	308024	0.03	26.94
	Wire products	486442310	Nail wire	59466379	35	25
			Zinc	292334		
B	Electric cables	14837996	Steel wire	537923	35	25
C	Winding wire	5900000	Copper rods	4200000	35	18.33
D	Welding rods	1000000	Wire rods	8206185	10	16.98
E	Wire Nails	2600000	Aluminium wire	670000	35	21.25
F	Roofing nails	2000000	Zinc ingots	75000000	35	20
			HCL acid	1111738		23.08
			Washer	47000		
G.	Nails	134492	Wire rods	2810000	25	18.1
H	Wire rods	1886011000	Billets	11305600	20	10
I	Wire	13480000	Wire rods	383221088	25	6.34
	Nails	19306800	Wire	13480000	35	25
J	Wire	2912820	Wire rods	33898300	25	9.81
	Wire		HCL acid	107701		30.06
	products	27171656	Wire	2912820		25
K	Wire products	11757400	Wire rods	188601000	35	
L	Wire	27000000	Wire rods	9585000	25	10
			Wire rods	27600000		20
	Wire products	28330000	Wire	2054239	35	25
M	Nails	4978730	Wire rods	2054239	35	19.4
			Wire rods	3639540		6.34

(b) Capacity Utilization:

Several approaches have been used to measure capacity utilization rates in industry. Time-based measures of capacity are a special type of survey approach[33]. Managers are asked the number of hours of operation per day, number of days of operation per year, number of shifts per day and number of labourers per shift in each plant. From these capacity utilization rates be estimated for each firm. This approach also considers a slackness variable showing the additional work that could be accomplished by the intensive use of existing labour and capital, is termed the weighted average time-based measures. It measured by the following formula:[34]

$$Ui = \left[\frac{1}{\sum_{i=1}^{n} \sum_{s=1}^{k} Lis} \right] \sum_{i=1}^{n} \left[\frac{\left(\sum_{s=1}^{k} Lis \right) \left[\sum_{s=1}^{k} LisHis/Lis(max) \right]}{(1 + A) H} \right]$$

Where

U = rate of capacity utilized

i = 1,2.....,n Numer of firms

s = 1,2.....,k Number of shifts per day

Lis = Number of labourers in plant i during shift s

Lis(Max) = The number of labourers in the biggest shift.

H = Potential maximum hours entrepreneurs are willing to operate per week.

Ai = This is a measure of slack during the current shift.

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[33] See Obere, A (1987): Auto-ancillary industry in Kenya pp 25. M.A research paper, Univ. of Nairobi.

[34] In Kenya, Coughlin's version of time-based measure has been used in studies of foundries and metal engineering workshops, pharmaceutical and hand tools and cutlery industries by Coughlin (1982), Owino (1985) and Kerre (1985) respectively.

This conceptual methodology for estimating capacity utilization is not used as data on both installed capacity and realized capacity is provided by the sample firms. A proxy for capacity utilized is computed in column (5) in the Table 13 below.

Causes of capacity underutilization: plant level perceptions.

From a list of options, managers indicated reasons for their current low rates of capacity utilization (Table 12).Almost all firms perceived insufficient demand and difficulties in obtaining imported inputs as the most important reasons for capacity under-utilization in the sub-sector. Other reasons not specified in the table cited by firms include, incompatibility of selling prices of controlled commodities in relation to actual production costs and problems in getting import licenses.

Table 12. Reasons for capacity underutilization in 1987-89

Reason	Number of firms answering			
	1	2	3	4
Uncompetitiveness	6	3	3	2
Difficulties in obtaining raw materials and spares.	5	2	1	2
Overcapacity of similar products in the country.	-	2	2	-
Fuel or electricity shortage.	1	-	1	4
Plant breakdowns.	2	1	3	4

Notes: 1 = very serious 2 = serious 3 = less serious
4 = not significant

Source: Annual returns to the Ministry of Industry, 1989

Table 13. Capacity utilization in wire and wire products firms in 1989. Metric Tonnes

Firm Name	Product	Installed Capacity	Realised Capacity	(4) in % of (3)
1	2	3	4	5
1.KUSCO	Nail wire	12000	6097	50.8
	Barbed wire	750	612	81.72
	wire nails	2400	1839	76.62
	Annealed wire	1800	808.6	44.92
	Galvanized wire	1800	1325	73.61
2.Kenby Cables Ltd				
	Electric cables	4000000	2385530	59.64
3.Coast Cables				
	Copper winding wire	300	76	25.3
4.Welrods Ltd.				
	Gas welding rods	360	50	23.8
5.Associated Steel Ltd.				
	Wire nails	500	289	57.8
6. Steel Enterprises Ltd.				
	Roofing nails	300	105	35
7.Sansora Wire and Nail Works				
	Wire nails	6737	116.7	1.73

Table 13 cont/

1	2	3	4	5
8.Special Steel Mills				
	Wire rods	75000	61000	81
9.Fehmi Nail Works				
	Nails	18000	7685	42.62
10.Iron International Ltd.				
	Wire nails	2400	1681	70.
	Nail wire	4000	1685	42.13
11.Wire Products Ltd.				
	Nail wire	1000	258	258.8
	Barbed wire	1200	1067	88.92
	Roofing nails	300	142	47.33
	Wire nails	2520	1960	77.78
12.Nalin Nail Works Ltd.				
	Steel nails	20760	9750	46.96
	Barbed wire	5040	1254	24.88
13.Khetshi Dharamshi Ltd.				
	Nails	600	250	41.67
	Nail wire	1750	1350	77.14
	Barbed wire	2300	1320	57.39

(c) Nominal rate of protection (NRP)[35]

This is defined as the ratio of the domestic ex-factory (protected) price of a product and the world market (freely traded) prices. The latter would be the cif price of imports or the fob price of a good if it is exported from Kenya. Data on nominal rate of protection (NRP)is shown in Table 14 (column 4).

4.4. Data Types and sources.

(a) Raw data.

Raw data on firms producing wire products, wire rods, billets is obtained from annual returns available from the Ministry of Industry. A detailed questionnaire (see Annex 1) was designed to collect the information on the following parameters: capacity installed and utilized, unit prices, unit costs, imported material inputs and sources, domestic and export sales, export compensation, products manufactured, destination of exports, reasons for capacity under-utilization, machinery investment plans and landed costs of material inputs. The data is tabulated on Annex Table 1.

The latest year on which data is available is 1989 for most of the firms and the others the latest year is 1988 or 1987.

(b) Data for regressions:

The data on the variables in the model specified above is tabulated in Table 14 below. There are seventeen observations,

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[35] For nominal rates on competing finished steel goods see import licensing schedules 1990.

an observation unit being wire or a cluster of wire products across the thirteen firms shown in Table 13. The data is obtained from the annual returns in the Ministry of Industry.

Table 14 Computed data on the variables to be estimated.

Percentages

Firm	Observation Unit	Effective rate of protection	Nominal tariff on final product	Average rate of tariff on inputs	Capacity Utilization.
1	2	3	4	5	6
A.	Wire	19.94	25	21.39	50.81
	Wire products	24.91	35	25	67.96
B.	Cables	24.81	35	35.63	59.63
C.	Winding wire	17.50	35	18.33	25.33
D.	Welding rods	13.89	10	16.98	13.89
E.	Wire nails	22.22	35	21.25	57.80
F.	Roofing nails	24.98	35	25.56	35.
G.	Nails	42.54	35	43.42	1.73
H.	Wire rods	9.83	20	10	81.39
I.	Wire	25.05	25	31.85	42.13
	Nails	24.85	35	25	70.04
J.	Wire	23	25	37.03	25.80

1	2	3	4	5	6
Wire products		24.44	35	30.09	78.33
K.Wire products		19.91	35	9.59	46.97
L.Wire		17.95	25	18.25	77.14
Wire products		24.89	35	25	54.13
M.Nails		14.82	35	15	42.69

Source: Own computations, see Tables 11 and 13 above.

4.5 Three Hypotheses will be Tested,

(a) Key Hypothesis:

There is a negative shift in protection levels from nominal to effective rates across the wire and wire products firms.

(b) Sub-hypotheses:

(i) There is a positive relationship between nominal tariff rate on the final product and the effective rate of protection,

(ii) A positive relationship is expected between the average tariff rate on material inputs and the effective rate of protection,

(iii) An inverse relationship is expected between capacity utilization and the effective rate of protection.

CHAPTER FIVE

EMPIRICAL RESULTS AND PROOF OF HYPOTHESES

5.1 Introduction:

This chapter applies the methodologies in chapter four and uses data obtained from the Ministry of Industry to prove the research hypotheses. This chapter begins with simple regression analysis, conducting step by step regression and later conducts multiple regression, using OLS techniques.

Measures of Central Tendency and Dispersion:

Series	Mean	S.D	Maximum	Minimum
NT1	23.492	8.785	43.42	9.5900
NT2	30.2941	7.388	35.00	10.000
CU	48.868	23.151	81.3900	1.7300

5.2 Results of simple regression and correlation analysis:

Using the Ordinary Least Squares (OLS) technique, simple regression of the data yielded the following results:

(a) Effects of average nominal rate (NT1) on effective rate of protection:

Variable	Coefficient	T-Stat
C	5.6700	2.5568
NT1	0.6989	6.9523

R^2 = 0.763 DW = 2.08 F = 48.33

(b) Effects of nominal tariff rate on finished product (NT1) on EP:

Variable	Coefficient	T-Statistic
C	7.7636	1.170
NT2	0.4729	2.219

R^2 = 0.247

DW = 2.320

F Statistic = 4.924

5.2.3. Effects of capacity utilization on EP.

Variable	Coefficient	T-Stat
C	27.186	6.8660
CU	-0.10428	- 1.41653

R^2 = 0.1179

DW = 2.09

F Statistic = 2.00

Interpretation of the results of simple regression analysis.

At 5 % level of significance ,using one tail test, only the coefficient of capacity utilization was found to be statistically insignificant. This means that its influence on effective rates of protection is smaller than the other variables.

5.3. Results of multiple regression and correlation analyses.

EP = 2.492 + .585 NT1 + .283 NT2 - .0558 CU + U

SE (3.752) (0.0959) (0.110) (0.0349)

R^2 = 0.8500

D.W = 1.87

F statistic = 24.57

Where EP = Effective rate of protection on wire products

NT1 = Average rate of tariff on imported material inputs

NT2 = Nominal rate of tariff on competing finished wire products.

CU = Proxy for capacity utilization rates.

U = Error term

5.4. The matrix table of covariance is shown on Table 15.

Table 15. Covariance Matrix

C, C	14.08153	C, NT1	-0.15428
C, NT2	-0.234342	C, CU	-0.057621
NT1, NT1	0.009204	NT1, NT2	-0.003865
NT1, CU	0.001133	NT2, NT2	0.012266
NT2, CU	-0.000951	CU, CU	0.001224

5.5. Interpretation of the Results and Tests of the Hypotheses

(a) The impact of average nominal rate of tariff on material inputs on the effective rate of protection:

$d\ NT1/d\ EP > 0$ (Positive)

There is a statistically significant positive relationship between the average nominal rate of tariff on material inputs and the effective rate of protection on wire products. A unit increase in NT1 increases EP by 58 %. Given that the nominal rate of tariff on wire products is higher than that on its chief raw material, wire rods, effective rate of protection on wire products is expected to be higher than the nominal rate of tariff the wire products industry is accorded. But a casual observation of the values of effective rate of protection across the firms in the sample indicate that they are less than the nominal rate of tariffs the industry is given. Thus nominal rates of protection are eroded (or shifted) by high protection on wire rods.

(b) The impact of nominal rate of tariff on wire products on the effective rate of protection:

$dNT2/dEP > 0$ (Positive)

There is a statistically significant positive relationship between nominal rate of tariff on the finished product and the effective rate of protection on the wire products. Effective rates of protection across the firms were found to be less than

the nominal rate of tariff on finished wire products. This indicates "water" in the tariff on these products. A unit increase in nominal rate of protection on wire products results only in 28 % change in effective rate of protection the industry receives. This is quite insignificant, indicating that the tariff does not provide adequate protection. Its effectiveness is reduced to some extent.

(c) The impact of capacity utilization rates on the effective rate of protection on wire products.

$dCU/dEP < 0$ (Negative)

A statistically insignificant inverse relationship was found between a proxy indicator of capacity utilization and effective rate of protection on wire products across the firms in the sample[36]. On average firms selected in the sample operate between 40 - 50 % of their installed capacity.

The implication of this result is that a lower capacity utilization results into a higher effective rates of protection. But this result was found to be insignificant, since effective rate of protection on wire products are lower than their corresponding nominal rate of tariffs on the finished products.

5.6. Diagnostic tests for Econometric Problems.

If any of the assumptions of the classical linear regression model are violated then the derived estimates are not BLUE (Best Linear Unbiased Estimators).

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[36] This result is confirmed by World Bank (1987) finding.

(a) E(Ei, Ej) = 0 (Serial Correlation).

The Durbin- Watson statistic (DW) was found to be 1.8765. At 5 % level of significance, this statistic was found to lie in the region of no auto correlation. Hence the above condition is not violated.

(c) Multicollinearity.

From the matrix table of covariance none of the variables were found to be linearly related. Therefore this condition p (X) = k<n is not violated.

5.7 Tests of Hypotheses:

(a) Key Hypothesis.

At 5 % of significance the F cal test statistic is 24.57

F critical (4, 17) = 2.93

Since F cal > F critical, we reject the null hypothesis. Thus on the basis of the sample given and results obtained, the model is explained. Therefore the hypothesis that there is shift of protection across the wire and wire products is proved. Even a casual observation of R^2 indicates that the independent variables explain 85 % of the variation in the dependent variable.

(b) Sub-hypotheses

(i) The impact of average nominal rate of tariff on material inputs on effective rate of protection:

Ho: b1 = 0, H1: b1 >0

At 5 % level of significance t critical is 1.771, t cal > t critical . Therefore we reject the null hypothesis. Thus the relationship between nominal rates of tariff on material inputs imported and the resultant effective rates of protection is proved to be positive. However the coefficient of this variable shows the extent to which the effective rate of protection to wire and wire products firms is shifted or eroded.

(ii) The impact of nominal rate of tariff on finished product on effective rate of protection:

Ho: b2 = 0, H1: b2 > 0

At 5 % level of significance t cal > t critical. We therefore reject the null hypothesis. Therefore the positive relationship between the nominal tariff rate on the final product and the effective rate of protection is proved to be positive. The implication of this result is that much as the firms in this industry enjoy high nominal rates of protection ,these rates are partially offset by protection of their suppliers of inputs as captured by the coefficients obtained.

(iii)The impact of capacity utilization on the effective rate of protection:

Ho: b3 = 0, H1: b3 < 0

At 5 % level of significance t cal falls in the acceptance region, we therefore do not reject the null hypothesis. Thus the expected inverse relationship between capacity utilization and the effective rate of protection is proved. However the

coefficient was found to be statistically insignificant. The implication of this result is that though there is a lower rate of capacity utilization in the industry, its impact on effective rates of protection is not significant.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions.

The research problems stated in chapter one were evidently made clearer in chapter two. These problems are well reflected in the statistics highlighted in chapter two.

The themes highlighted in the literature reviewed did not fully address the research problems stated in the introduction. This constitutes a gap, on which the justification for this study is based.

Using the methodologies and data in chapter four, the empirical results have proved all the hypotheses derived from the study objectives stated in chapter one. This proves beyond doubt that the pattern of development of this sub-sector as reflected in chapter two is by and large shaped by the structure of the protection regime.

A central theme emerging from this study is that this industry is highly overcapitalized and consequently under-used despite the existence of high demand for wire products. Two main factors contributing to this situation are one, in the past, manufacturers manipulated the fledgling protection institutions to their advantage, succeeding in obtaining high rates of effective protection in the 1970's and 1980's. These high rates of effective protection induced many new entrants into the

industry even when those in the industry were using less than 50 % of their installed capacity. Two, monopolistic tendencies in the industry especially by the well established integrated firms contributed to defensive investments, hence unnecessarily increasing excess capacities.

Citing duty anomalies between wire rods and billets as the base of their argument Special Steel Mills Ltd. succeeded in reducing duty on the latter and increasing on the former. Special Steel Mills Ltd presently charges its wire rods a higher price than that of imported wire rods inclusive of duty even when producing at only 20 % capacity[37]. This not only resulted into closure of the only billet manufacturer but other downstream industries invested in wire drawing machinery due to the high local cost of local wire rods and the unreliability in supply.

The high cost of local wire rods and other raw materials over the cif imported cost is the determinant of the import duty and sales tax on imported inputs. These duties are too high, hence reducing the competitive edge of the firms. Local material costs are very high partly because of under-utilization of capacity[38].

This study has empirically found that protection accorded to wire products using imported inputs available locally is shifted or eroded as reflected in low or negative rates of effective

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[37] This firm has been charging Kshs. 7250/t above 1300 Kshs. the landed Nairobi cost of imported wire rods.

[38] Manufacturers own opinions.

protection. Hence demands by wire and wire products firms to have the rationalization of duty on wire and wire products is justified.

The erosion or shifting of the protection in the industry imply "water" in the relevant tariffs which is the cause of so many imported products on the Kenyan market.

It was noted earlier that this industry has developed many branches and products. Growth occurred without any coherent plan for this industry's long term development (Coughlin 1991:284). This occurred because the government did not have a clear vision of how it wanted this strategic industry to develop. My study has corroborated evidence of other previous studies that government's policies towards this industry have been inconsistent.

As a result Kenya is missing big opportunities to deepen import substitution and promote exports in this industry. To achieve these potentials the following policies are suggested.

6.2 Recommendations.

General policies have been suggested in the past to curtail monopolistic practices, redundant investments and improvement of efficiency in the sector[39]. Specific policies have been suggested to rationalize the tariff regime in this industry. This study

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[39] See Sessional Paper No. 1 of 1986 on Economic management for Renewed Growth.

suggests alternative approaches to improve the above cited measures taking into account the empirical findings of this study.

Controlling of monopolistic practices:
Exposure to competition by way of liberalization of the trade regime and price controls failed to break their market power. This was because implementation of the policies is poorly coordinated. It is recommended that the institutions be strengthened and appropriate and realistic studies on the sector be updated from time to time with a view to uncovering loopholes which the manufacturers exploit to their advantage.

Again the institutions charged with regulating investment in redundant capacities such as Ministry of Industry, Investment Promotion Centre should be strengthened with qualified economists,engineers,meturllugists to conduct detailed studies on the sector. They should be authorized to intervene and reject new plants or major expansions of steel plants if less than 70 % of the installed capacity to make the proposed products is being used.

The major objective of this study is to recommend realistic and suitable criteria for the rationalization of the protective regime. Without understanding the extent to which nominal rates of protection are eroded or shifted, it is difficult to recommend appropriate tariff adjustments either upward or downwards on the inputs or outputs.

This study has found significant shifts in the levels of protection from wi.re products to wire drawing firms. It is recommended that tariffs on excessively protected inputs be gradually lowered depending on the new levels of effective protection. If these effective rates protection are equal to nominal tariff rates or higher, it should be the basis for adjustment of duty on the inputs downward, if the producers of the same uses less than half of their installed capacity. In conclusion tariffs, subsidies, quantitative restrictions and duty drawbacks should be used selectively to discourage redundant investments in the sector.

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ANNEX 1

QUESTIONNAIRE

1.Name of the firm:.....

Year of establishment:.....

Address of the firm:.....

Name and addresses of the subsidiaries:.....

.....

2.Nail Wire or Nails or Wire Rod Coils or Billets Manufactured by Sizes.

(I).....

(ii).....

(iii).....

(iv).....

(v).....

3.Who are your competitors by product.....

.....

.....

4. Installed Capacity (tons per year or per month) by size of nails or nail wire or wire rod coils or billets.

(i)..... size.....tpy or tpm

(ii)....." ..... " " "

(iii)..... "..... " " "

(iv)..... " ..... " " "

(v)....." ....." " "

5.Material input intake rates at the installed capacity rates Qty per year

---

Nail wire or wire rod coils or nails or billets Material inputs by size

---

(i).....

(ii).....

(iii).....

(iv).....

---

4. Sales Revenue:

Nail Wire or Nails or Wire Rod coils or Billets in Sizes.

Variables.

---

1. Units of measurements .....

2.Prices per unit (Kshs.) at

.....tpy capacity utilization ....

....tpy " " .....

.....tpy " " .....

3.Actual Quantity produced (tons)...

4.Quantity Sold in

Domestic market.....

Export market.....

5. Wire Galvanizing or Wire Drawing Capacity:

(1) Date of installing the machinery .....

(2) Reasons for installing the machinery.

.....

.....

.....

.....

(3) Installed capacity of the plant.....tpy

(4) Actual production .....tpy

(5) Planned Distribution of the inputs:(tons)

Sister firms:.....

Non Sister firms .....

Names of Non Sister Firms .....

6.Material Input Costs:

Variables.	Material Inputs
1. Units of measurement	
2. Quantity per ton of Nail Wire or Nails or Wire Rod Coils or Billets in Size....at....tpy Capacity utilization.....	
"..... "..... " " "	
..... " ..... " " "	
....."..... " " "	
3.Quantity of the inputs used p.a or p.m for the above product by size:	
size....at.....tpy Capacity utilization.....	
..... "..... " " "	
..... "....." " "	
4.Rate.Kshs.per ton from	
Sister Firm.....	
Non Sister Firm.....	
Wholesale Importers.....	
5.Proportion of Quantity of inputs from	
Sister firm.....	
Non sister firm.....	
Importers.....	
Names of Non Sister Firms	

7. The Rates Of Protection:

(a) Finished Product.

Variables.	Nails or Wire Rod Coils or Billets or Nail Wire
1. S.I.T.C. Code.....	
2.Tariff Duty %	
3.V.A.T %	
4.C.I.F.Import price $	
5.Import Schedule.....	
6.Export compensation rate %	
7.Is the product price controlled..	
8. FOB Export Price	
9.Export Markets (Countries).....	
10.Competitors (Countries).....	
11.Prices of Competing products.....	
12. Export Duty %.....	
13.Remarks on the incentives	

(b) Protection of material inputs:

Variables.	Material Inputs:For making Nails and Wire rod coils or Billets.
1.S.I.T.C. Code.....	
2.Tariff Duty %	
3.V.A.T %	
4.Landed Cost in Nairobi.....	
5.C.I.F. Import price Kshs.....	
6.Domestic price Kshs.....	
7.Duty Remission rate %.....	
8.Import Schedule.....	
9.Import Quota Allocation.(tons).....	
10.Planned Import Quantity.....	
Time Stock Expected to Last (months)	
at.....tpy Capacity utilization.....	
.....tpy " ".....	
.....tpy " ".....	
11.Actual Quantity Imported.....	
Time Stock Lasted (months) at	
.....tpy Capacity utilization	
.....tpy " ".....	

Material Inputs

12.Amounts per each of the following charges on import licence application:

(a).....

(b).....

(c).....

(d).....

13.Is the input price controlled.....

13 Export Duty %.....

14.Source of import.....

FOB Price.....

Freight charges.....

15. Is sales tax refunded.....

16.Remarks on the incentives granted....

10 Plant Capacity Utilization:

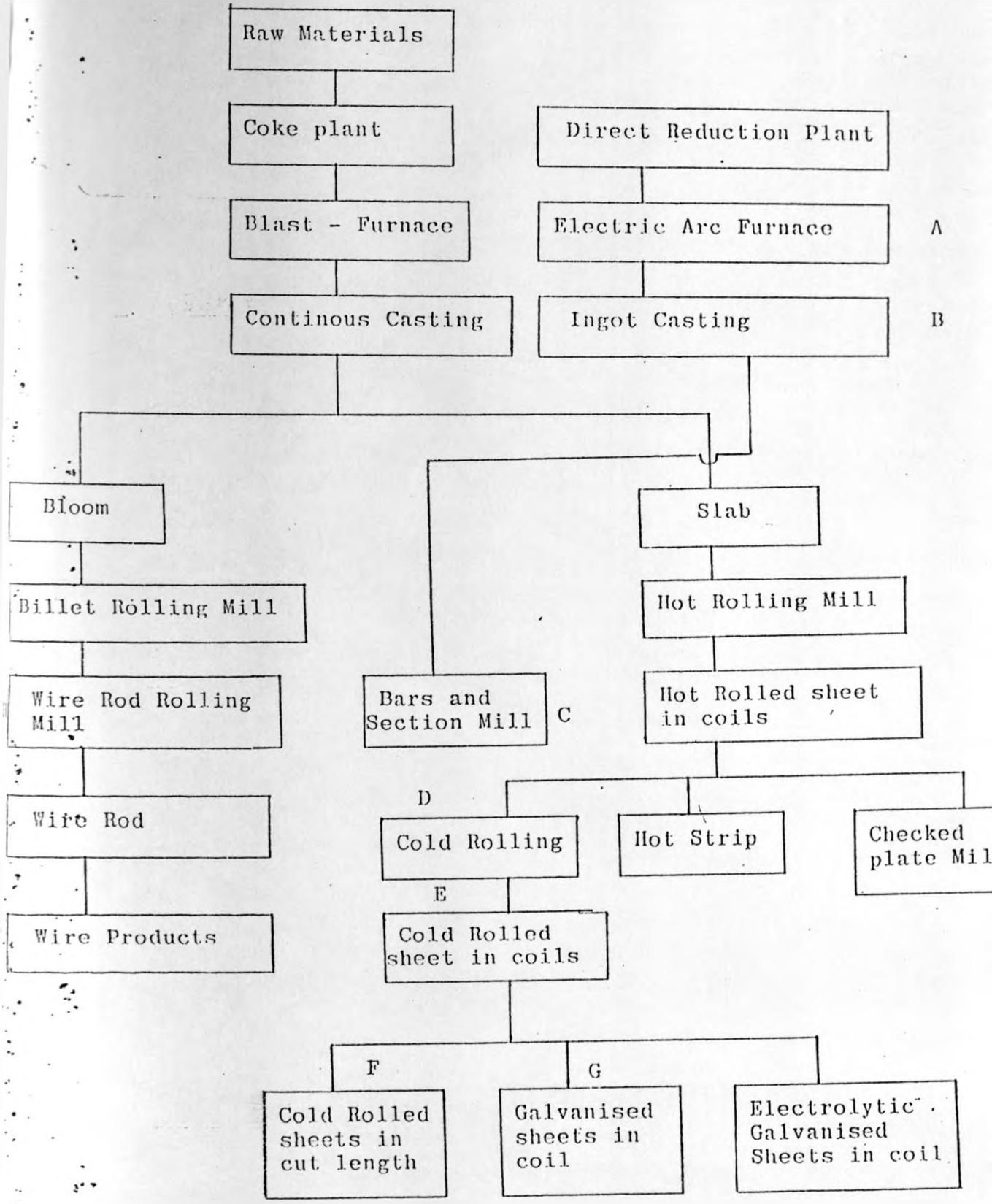
No. of shifts per day	Average hours worked per day shift i	No. of labourers during shift i	No. of workers in the biggest shift	Percentage additional output that could be realized with same labour, plant %
(1)	(2)	(3)	(4)	(5)

Annex Table 1: Raw data on Steel Firms in Kenya

Firm Code	Products	UOM	Installed capacity	Realised capacity	Value of inputs	Imported inputs	Cif cost	Import duty paid	Sales tax paid	other taxes
		Tons								
A	Drawn wire	1	12000	6097	56543045	Wire rods	50405334	5040533	69582	2932342
	Barbed wire		750	612		Drawing powder	308024	109702	69582	13391
	Nails		2400	1839	21722791	Nail wire	56543045			
	Annealed wire		1800	808.6	10247388	Zinc	2923334	877000		110649
	Galvanized wire		1800	1325	16672139					
B	Electric Cables		40000000	2385530	14837996	Steel wire	537923			
C	Copper winding wire		300	76	590000	Copper rods	4200000	1370743	1165131	
D	Gas welding rods		360	50	100000	Wire rods	8206185	1393815		
E	Wire nails		500	289	260000	Alluminium wire	670000	142375	100500	
F	Roofing		300	105	200000	Zinc Ingots	7500000	1500000		
						HCL acid	111173	25656		
						Acid nail washer	470000	158000	68000	
G	Nails		6737	116.7	1344992	Wire rods	2810000	508695	580068	131607
H	Wire rods		75000	61000	188601000	Steel billets	113056000	10838000		
I	Wire nails		2400	1681	19306800					
	Nail wire					Wire rods	38321088	2427650	1235338	
			4000	1685	13306800	Drawing powder	150248	51992	34092	
J	Nail wire		1000	258	2912820	wire rods	33898300	3326147	4517511	
	Barbed wire		1200	1067		HCL	107701	32374		
	Roofing nail		300	142	3388791	Zinc ingots	2113710	636570		
	wire nails		2520	1960	23783865	Drawing lubricant	243617	75336		
K	Steel nails		20760	9750	117574000	wire rods	188601000	6928900		
	Barbed wire		5040	1254						
L	Nails		600	250	3250000	Wire rods	3150000	630000	642600	
	Nails wire		1750	1350	27000000	Wire rods	9585000	958500	1792395	
	Barbed wire		2300	13200	13200	Wire rods	27600000	5520000	5630400	
	Nails		18000	7685	4978730	wire rods	2054239	398540	406510	29890
						wire rods	3639540	354700	663289	45225

ANNEX FIGURE I

STEEL PRODUCTION AND WHAT EXISTS IN THE COUNTRY 1992



Existing Facilities in the country are shown from A - J