ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

FACULTY OF BUSINESS AND ECONOMICS

DEPARTMENT OF ECONOMICS

ECONOMIC ANALYSIS AND MEASURING THE DOMESTIC COMPETITIVENSS OF AN IMPORT SUBSTITUTING FIRM: THE CASE OF TABOR CERAMIC PRODUCTS SHARE COMPANY (TCPSC)

A Project Submitted to the School of Graduate Studies of Addis Ababa University in partial fulfillment of the requirements for the Degree of Master of Art in Economics

By

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June 2009

Addis Ababa

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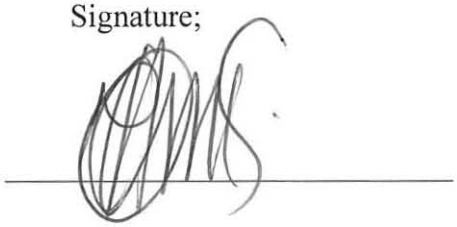
By

BEYENE GIZAW MEKA

Approved by:



Signature;



Dedicated to

My Mother, My Daughter, and My wife

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ABSTRACT

This research focuses on the economic analysis of an import substitute firm. It studies and analyses the Tabor Ceramic Product Sharing Company (TCPSC). TCPSC is the only IS ceramic firm found in Ethiopia. We examine the value chain and technical characteristics of the firm. It generates the domestic competitiveness index of the firm in the domestic market. It employs the unit cost indicator method in measuring domestic competitiveness. The study normalizes the competitiveness index. It applies regression to determine the dynamics of the firm's competitiveness, and employs OLS to analyze the impact of the major determinants of the domestic competitiveness of the firm. It also determines the ceramic product concentration and compares the market share of the firm vis-à-vis imports to show the domestic competitiveness of the firm.

Key words; - Import substitution, Value chain, Competitiveness, Domestic competitiveness index, Unit cost indicator, OLS regression, Concentration, Market share.

1. Introduction

1.1. Import Substitution Industrialization (ISI)

Import Substitution Industrialization (ISI) is a trade and economic policy based on the premise that a country should attempt to reduce its foreign dependency through the local production of industrialized products (Wikipedia, the free encyclopedia). It is state-induced industrialization through governmental spending and largely influenced by Keynesian thinking, as well as the

infant industry arguments adopted by some highly industrialized countries, such as the United States, until the 1940s.

ISI is a development theory; however, its political implementation and theoretical rationale are rooted in trade theory. "All countries that have industrialized after the United Kingdom went through a stage of ISI in which the large part of investment in industry was directed to replace imports" (Baer, 1972).

Many Latin American countries adopted it from the 1930s until the late 1980s. The initial date is largely attributed to the impact of the Great Depression of the 1930s, when Latin American countries exported primary products and imported almost all of the industrialized goods they consumed, were prevented from importing due to a sharp decline in their foreign sales. This served as an incentive for domestic production of the goods they needed. Moreover, some Asian and African countries adopted ISI from the 1950s on.

ISI was most successful in countries with large populations and income levels, which allowed for the consumption of locally produced products. Latin American countries such as Argentina, Brazil, Mexico, and, to a lesser extent, Chile, Uruguay and Venezuela, had the most success with ISI (Blouet and Blouet, 2002). This is because the investment to produce cheap consumer products may pay off in a small consumer market.

Initially, import substitution was based on pragmatic choices of how to face the limitations imposed by recession. ISI gained a theoretical foundation in the 1950s. ISI policies theoretically grounded as a set of development policies on the Singer-Prebisch thesis, on the infant industry argument, and on Keynesian economics. ISI involves practices to subsidize and orchestrate production of strategic substitutes, protective barriers to trade (e.g. tariffs), an overvalued

currency to help manufacturers import capital goods (heavy machinery), and discouragement of foreign direct investment, Wikipedia, free encyclopedia.

Ethiopia is one of the African nations that have adopted ISI policy as a development strategy since the 1950s. ISI remained as the main strategy for industrial development in the later years too. ISI policy created an enabling investment environment and resulted in the establishment of many manufacturing industries in the country. The number of the IS manufacturing industries established under this policy reached 273 in 1974, (Samson G/Micheal and Tadele Ferede, 2002).

The major advantages of ISI are increased in domestic employment (reducing dependence on labour non-intensive industries such as raw resource extraction and export), resilience to a global economic shocks (such as recessions and depressions) and less long-distance transportation of goods. Whereas, the disadvantages of ISI is that the industries that it creates are inefficient and obsolete, and that the industrial development impoverishes local commodity producers who are primarily rural.

1.2. Domestic IS Ceramic Firm

Tabor Ceramic Product Sharing Company is located in Awassa in the Southern Regions of Ethiopia. The Ethiopian government established the factory in 1996 with a dual objective: satisfying the growing domestic demand for ceramic products and exporting when possible.

The Company has three production lines: namely, the ceramic tile line, the tableware line, and the sanitary materials production lines. The production lines have different production capacity, and different requirements of capital, labor, and other raw materials. According to the factory management, the tile production line takes up some 50% of the total firm production capacity.

The sanitary and the tableware production lines account for 33 and 17 percent of the factory's production capacity, respectively.

1.3. Statement of Problem

The current construction and housing policy of the country encourages private investors and the state to engage widely in the construction industry. Thus, the demand for ceramic products is growing more than ever before. Import takes a larger share than the local supply of ceramic products to satisfy the demand for ceramic products in the country. This contributes a lot to the country's trade deficit every year.

1.4. Justification and Use of the Results

There has been no study undertaken to economically analyze and measure the competitiveness of this factory either domestically or in the international market. Thus, this study will fill this knowledge gap. The knowledge will help the company to take the necessary technical and managerial adjustment that would improve its competitiveness and efficiency too.

Moreover, measuring domestic competitiveness of ceramic firms in the domestic market would provide the Domestic Competitiveness Index of the existing ceramic firm. The lack of such knowledge again justifies the study. The result of the study will make the firm aware of its position in the domestic market. In the end, this will encourage the firm increase its production and productivity. This would enable the firm improve its competitiveness, and profitability.

1.5. Objectives of the Research

The primary objective of the research is to determine the domestic competitiveness index of the local IS ceramic firm in the domestic market.

1.6. Hypothesis

The research hypothesizes and tests the following two statements:

1. The current and past competitiveness has direct and positive role in the dynamics of competitiveness of the firm
2. The labour productivity and working capital are determinants of the domestic competitiveness of the firm in the domestic market.

1.7. Methodology and Data Required

Getnet and Admit (2001) used the theory of firm to determine the Domestic Competitiveness of Ethiopian Manufacturing Industries. The theory states that total revenue of production must equal to the total cost of the production in the competitive market structure. We use similar argument as our methodology to determine the domestic competitiveness of the firm. It follows a unit cost ratio (UC) - defined as total cost divided by the total revenue - approach to find out the domestic competitiveness index of the local firm. The study will use 42 months and ten years/ 1999 – 2008/ production and revenue data of the firm to determine its domestic competitiveness.

Nesterenko O., and Korablin S., 2006, undertook a study on Competitiveness of Ukrainian Products. They normalized the competitiveness index. They used regressions and Ordinary Least Square regression to determine the dynamics and determinants of competitiveness, respectively.

The research will adopt a methodology similar to this to determine the domestic competitiveness index of the local ceramic firm. Thus, it will normalize the 42 months competitiveness index calculated and determined from the past 42 months production cost and revenue data. Then, the study will use regression model in which the current competitiveness index is a dependent variable and the past one month competitiveness index is the independent variable.

$$UCs = (UC - 1)/ (UC + 1) \quad \ldots\ldots (1)$$

$$UCs_t = \alpha + \beta UCs_{t-1} + \xi \quad \ldots\ldots (2)$$

UCs is normalized unit cost or unit cost symmetry. α and β are standard linear regression parameters and ξ is a residual. ß measures how stable the specialization pattern of a firm has been between the two periods.

Subsequently, the study will implement the Ordinary List Square to determine the impact of the different determinants of the domestic competitiveness of the ceramic firm. Working capital shortage, technology, labor productivity, and advertisement are the major determinants of the ceramic firm competitiveness. Hence, the study regress the competitiveness index on the labour productivity and the working capital. It will test a null hypothesis that labour productivity and working capital does not have impact the domestic competitiveness of the ceramic firm.

$$UCs = \alpha + \beta_1 L + \beta_2 WC + \xi \quad \ldots\ldots (3)$$

Moreover, the study will measure the concentration ratio of the firm. It will compare the concentration of the firm product with the imports, and attempts to show the domestic competitiveness of the ceramic firm in terms of market share.

2. Literature Review

2.1. Import Substitution (IS) Concepts

2.1.1. Definition

Business Dictionary defines Import substitution (IS) as government strategy that emphasizes replacement of some imports by encouraging local production for local consumption, rather than producing for export markets,. Import substitutes are meant to generate employment, reduce foreign exchange demand, stimulate innovation, and make the country self-reliant in critical areas such as food, defense, and advanced technology.

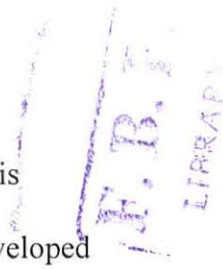
Import substitution is a complex of measures and methods for the promotion of own products and the replacement of imported ones through the creation of firms in the country for the achievement of social, economic, and political purposes, Maygor Consulting Company, 2005.

"The issues related to export promotion and import substitution first concern the state regulation in the economy, which mainly influences foreign trade. The state can pursue its goals of economic development through foreign trade by means of two main approaches: import substitution and export promotion, which reflect the focus of state regulation measures in the field of trade. Import substitution supposes the establishment of high trade barriers (in the form of

quotas, licenses, tariffs, obligatory demands to use domestic goods and services instead of foreign ones, limitations for use of foreign currency for imports etc.) in order to stimulate internal production substituting imported goods", Hogendorn, 1996.

"Import substitution is substituting the imported goods with the locally produced goods in order to meet the internal demand" (Bruton, 1998). Hence, an IS strategy calls for a protection of the local market by the government. The protection is not only via tariffs and quotas but also via exchange rate, prices of the factors of production and interest rate. This illustrates a government intervention into the market.

In the initial stages of an IS strategy, the protection is supposed to be temporary with the assumption that the protected industry will gradually progress and will be able to compete with foreign industries. Nevertheless, in practice, the results seem to be on the contrary. Since the protected industries are not chosen via appropriate competition criteria, a need for a permanent protection appears. This again results in an undesired results.



IS strategy appreciates local production via government intervention in the economy. It is evaluated as the process of modernizing the local economy and reaching the level of developed countries.

Usually, the first stage of an IS strategy is meant to produce consumption goods in the country. This is because there is an internal demand for these goods, and the firms that produce consumption goods do not use advanced technology. Moreover, IS strategy involves alternative

policies such as export promotion (EP) policies. That is to say, the local industries may develop in order to compete with the foreign industries during an IS strategy.

The most attractive part of the IS strategy is the decrease in the foreign currency expenditures, and hence, the reduction in trade deficit. However, import of intermediate goods for production of high-level technology raises the level of trade deficit and influences the trade balance. Hence, countries that practice IS strategy usually may include production of intermediate goods with an aim to form a basis in producing high level of technology. Broadly speaking, export promotion and upgrading the production structure to enable to produce intermediate goods forms the two alternatives of the second stage of IS strategy.

By the time inward oriented countries begin to produce high technology goods, industrialization becomes into the picture. This means that the structure of the production function changes through a capital-using process. The human labour is used less which in turn leads to unemployment problem. A brief example of it is the changing structure of a country's production from agriculture to industrialization.

2.1.2. Possibilities and limitations in Import Substitution Strategy

Most developing countries pursued import substitution after they gained independence. They followed the strategy in order to overcome the challenges they faced to deliver sustainable economic growth and improving living standards of their population.

IS strategy was favored by developing countries because the goal of the production is to serve the internal demand, and competition with foreign industries requires high levels of knowledge, ability and tentative. Moreover, there may be problems in returns to scale, such as high production costs in developing countries.

"In general, raw materials and primary goods production oriented economic structure, the engagement of high work force in agriculture and the corresponding very low marginal product of labor, and the need for accumulation of capital are the major facts that gave way and possibilities to pursue import substitution strategy to the developing countries. Along with the above, the consequence of free trade policy to put production of raw materials as a comparative advantage, and low elasticity of demand for raw materials to both world incomes and prices are among the factors that made import substitution a feasible industrialization strategy in the developing countries" , (Krueger, 1997).

In the early applications of IS strategy, most of the governments used a fixed exchange rate policy. However, after a while, their local currency appreciates, which in turn, affects the balance of trade negatively. "In general, countries with a more volatile real exchange rate experienced poorer overall performance than those nations that had managed to maintain a more stable real exchange rate", (Edwards, 1993).

Beyond the barriers, there is high level of prices and low quality of goods in the countries that apply IS strategy. Local producers, in the absence of competition, may not engage in any research and development. Moreover, there may be monopolizations in the absence of competition, which can result in the misallocation of resources.

IS strategy has a negative effect on exporters. Since the exchange rate appreciates in order to protect the internal industries locally produced goods become relatively expensive for foreign countries. This, in turn, disadvantages the exporters and worsens the trade balance. Both decreasing exports and increasing dependence on foreign intermediate goods worsens the trade balance further and further. This, in turn, leads the country (that applies IS strategy) to borrow money in order to finance the trade deficit, (Yilmazkuday, 2008).

In outward oriented countries, interest rate, inflation and exchange rate are determined in the market. However, in inward oriented countries the government, which destroys the resource allocation of the economy, determines these values (Bruton 1998).

In short, the policies used in an IS strategy closes the country's economy to the rest of the world. The policies on price, interest and exchange rate are repressive. Because of the high protection levels, internal and external price levels differ much in value. The government remedies the absence of competition with the foreign industries, but this in turn demolishes the economy further and further (Bruton 1998).

While choosing an import substitution strategy, the government intention is to protect the industrial basis of the economy from the market. In such a way, the market could greatly change the industrial structure of the economy, and urges directing more resources to services. At the same time, the policy of the government will base the development of the industrial base of the country through import control, tariff, quantitative and other restrictions, licensing, and foreign exchange regulation. This, in the long –run will influence negatively the development of

agriculture and exports. However, what usually happens in reality is that if industry is not open for international competition it will become uncompetitive.

Conditionally, development of the import substitution strategy is divided into two phases. In the first phase, such countries develop those sectors of industry, which are based on relatively simple and labor intensive production, where economies of scale are absent and systems of related production are not needed. They are mainly textile, wood processing, furniture, leather, footwear production and some other branches producing consumer goods of short and medium term use. In many countries, this phase was rather successful. Under the import substitution strategy at this phase, when the industry mainly produces consumer goods, production growth actually depends on the dynamics of consumption. In such strong correlation between production and consumption, the capacity for savings radically decreases.

In the second phase of the import - substitution strategy, the task is to develop capital-intensive production of durable goods and capital goods. In major countries at this stage, there appeared the problems in implementing the designed plans. The reasons were, first, strong dependence of production on economies of scale and second, narrow national markets and difficulties in creating regional markets. As a result, the created production capacities were underused. That is why natural monopolies occurred, as there was no more necessity for such production.

The World Bank conducted a study on a comparison of the results of economic policies pursued by 41 countries with different trade orientation: import substitution and export orientation. The study shows the possible consequences of import substitution policy and indicates in favor of the

choice based on export promotion oriented economic development. Table 1 presents the main results of this study. INSERT Table 1

In spite of explicit advantages of export promotion strategy, most countries in their development initially went through the stage of strong protectionism and import substitution, and then shifted towards more export orientation. "Very often substitution of imports by domestic industrial goods is the way to economic independence", World Development Report, 1987. However, only the countries, which were able to orient their economies for export, could achieve sustainable economic growth and maximally benefit from globalization and integration into the global economy.

2.2. Competitiveness

The concept of competitiveness reminds that of competitive advantage. The concept of competitive advantage is central in strategic management studies (Porter, 1985; Ghemawat, 1986). It recalls that of comparison and rivalry. It can be interpreted as "the asymmetry or differential among firms along any comparable dimension that allows one firm to compete better than its rivals" (Ma, 2000). A competitive advantage refers to the position of superiority within an industry that a firm has developed in comparison to its competitors. Firm level competitiveness indicates a firm's ability to design, produce and market products superior to those offered by competitors, where superiority can be evaluated from several factors, like price, quality, technological advancement, etc.

2.2.1. Definition of Competitiveness

There is little consensus about the precise meaning and definitions, and the method of measurement of competitiveness though economists, politicians, and business leaders frequently use the term.

"Competitiveness is a multidimensional concept. Authors define the term "competitiveness" at different levels of aggregation: firm, industry, and country. Therefore, researchers use the concept of competitiveness in many different, often overlapping, ways" (Buzzigoli and Viviani, 2006) using different measures, indicators and analytical methodologies.

"Competitiveness originated from the Latin word, competer, which means involvement in a business rivalry for markets. It has become common to describe economic strength of an entity with respect to its competitors in the global market economy in which goods, services, people, skills, and ideas move freely across geographical borders" (Murths, 1998).

Firm level competitiveness can be defined as "the ability of a firm to design, produce and / or market products superior to those offered by competitors, considering the price and non-price qualities" (D'Cruz, 1992).

"Competitiveness" is primarily a firm-level concept and refers to the ability of a firm to produce output of superior quality and lower costs than its domestic and international competitors. It is reached by improving product quality and through processes of product development. Competitiveness is also synonymous with a firm's long-run profit performance (Asian

Development Outlook 2003). Firm level analysis of competitiveness focuses on behaviors and performance of firms.

For the company, competitiveness is "the ability to provide products and services as or more effectively and efficiently than the relevant competitors" (Blunck 2006). In the traded sector, this means sustained success in international markets without protection or subsidies.

Moreover, the world competitiveness report defines company competitiveness as "the ability to design, produce and/or market products superior to those offered by competitors, considering the price and non-price qualities" (WCR, 1991, p 8), K Momaya, Evaluating International Competitiveness at the Industry Level, Vol. 23, No. 2, April - June 1998 39.

At the firm level, profitability, costs, productivity and market share are all indicators of competitiveness. Generally, competitiveness is considered synonymous with success. In very simple terms, success can be intended as achievement of company objectives. Hence, performance should be measured in terms of how an organization manages its critical success factors (Ferguson and Dickenson, 1982).

Why is Competitiveness Important?

Blunck 2006 states that a nation's standard of living is increasingly dependent on the competitiveness of its firms. Competitiveness is vital if the nation's firms are to take advantage of the opportunities presented by the international economy. It is also vital if a nation's firms are to guard against the threats posed by the international economy.

2.2.2. Measure of Competitiveness

The World Economic Forum (2000) sees competitiveness, as described in its World Competitive Report and African Competitiveness Report, in terms of economy wide business environment. Here, competitiveness is measured through a weighted index that includes different items; namely, political and economic stability, openness to trade and investment, legal and institutional enabling environment, financial infrastructure and institutions, human resources development and technology, and economic and social infrastructure. Such measure, however, does not allow for evaluating a single industry or firm, since it does not capture industry or firm specific capability differences and since it heavily depends upon subjective judgments, Getnet and Admit, 2001.

The firm or industry level use of the term shows that a producer is competitive if its unit cost of production is less than or equal to those of its competitors both in the domestic as well as in the international markets. In this case, the indicator of competitiveness is the unit cost ratio. The shortcoming of such an approach is that it does not take into consideration the selling capability of a firm. A firm may be cost competitive while it does not have the necessary knowledge to successfully market and deliver its product. This excludes non-cost determinants of competitiveness (Siggel, Ikara, and Nganda, 2000).

In line with the neo – classical theory of firm, Cockburn et-al (1998), Siggel and Semogerere (1999) and Siggel, Ikara, and Nganda (2000) use the unit cost ratio approach. Their approach rests upon comparing the cost structure of local firms with those of their competitors (possibly

imports) to determine their competitiveness. Symbolically, the formula below shows the unit cost approach,

$$\mathbf{UC \leq UC_F}$$

Where F represents the foreign competitor and UC= unit cost, which is total production cost (TC) per unit of production. This altogether with that consumer's value quality through price leads to:

$$\mathbf{UC = TC/ PQ}$$

Where P = price, Q= quantity produced. Since firms produce products of different quality, physical unit comparisons among firms might be unreasonable.

Hence, the indicator of competitiveness – the unit cost ratio – is defined as total cost divided by the value of output.

Firm's theory asserts that in the long- run, through free entry and exit of firms and the free interplay of market forces, firms are supposed to operate at or near zero profit in order to survive. Employing the same principle, a typical international best practice competitor is assumed to sell at cost, implying that TC=PQ. Therefore,

$$\mathbf{UC_F = \frac{TC}{PQ} = 1}$$

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

$$\mathbf{UC \leq 1}$$

UC $\leq$ 1 implies, the firm in question produces at a lower cost than its competitors produce, and is thus more competitive.

There are different types of indicators to measure competitiveness. These are the indicator of domestic competitiveness, the indicator of international competitiveness, and the indicator of comparative advantage. All measures show the financial profitability of a firm. Competitiveness, domestic and international, is measured in terms of market prices while comparative advantage in terms of shadow prices (economic opportunity costs) net of all price distortions. Domestic competitiveness reflects financial profitability at domestic, protected, distorted prices. Symbolically, the following is an indicator of domestic competitiveness as:

$$\mathbf{UC_D = \frac{TC}{P_D Q} \leq 1}$$

Where D represents domestic competitiveness and P_D represents domestic (protected) prices, which usually refers to ex-factory prices for domestic sales. The formula above assumes that the domestic prices of output depend on border prices of equivalent imports, implicit nominal rate of protection, and monopoly power.

Moreover, the following assumptions are also employed for this:

a) Total cost is the difference between gross value of production (GVP) and operating surplus (P), as defined by CSA. Symbolically: TC= GVP – P

b) In the short run, fixed costs are assumed to be sunk costs.

c) In the long run, fixed costs are not sunk costs. Fixed assets are variable.

d) Opportunity cost of capital (rate of return foregone, the current lending rate, the current saving rate, the official discount rate (r) currently in force, which is 10%, will be used.

e) The fixed assets of a firm or industry are measured by their net fixed asset value (K), as defined by CSA. Symbolically: TC=GVP - P+ rK

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

a) Short- run scenario: $$UC_D = \frac{TC}{P_DQ} = 1 - \frac{P}{GVP} \leq 1$$

b) Long – run scenario: $$UC_D = \frac{TC}{P_DQ} = 1 + \frac{rK}{GVP} - \frac{P}{GVP} \leq 1$$

The study uses the above method (a) of measuring domestic competitiveness of the local ceramic firm.

3. Ceramic Firms' Technical Characteristics and History in Selected Countries

3.1. The Technical Characteristics of the Production Process*

The technical characteristics of the production process of ceramic firms are universal. The Ethiopian Ceramic Firm shares the same technical characteristics as that of the rest of the world ceramic producing firms.

* The details of the technical characteristics is as per Margherita R., Peter B., Emilio C, Francois L., and Franscisco M, 1996, and TCPSC production flow chart

The first stage prepares the raw materials using a dry process of grinding the clay into a fine product, which is wetted and passed into tile/ sanitary ware or tableware shape. Another technique of preparing raw materials is a wet method where first the raw material is milled, then fluidified and finally sprayed into a spray drier to obtain the finest powder for pressing into shape. Not only pressing in the fine powder into the **die** but also the extrusion can give the shape of tiles and other ceramic products. Both the pressed and the extruded tiles or ceramic products are then fired to produce "**Biscuits**". The biscuit is then sorted, glazed and fired again. The products are finally graded and sorted to give the final product. This process of production is called **"Twice Firing",** as opposed to an alternative process in which tile and ceramic products are glazed directly after the pressing operation and then fired only once, which is called "**Single Firing"** process of production.

Currently, there are two firing techniques. The first technique uses traditional tunnel kilns, where the kiln cars, loaded with a piled tile, enter the kiln. In the second process, a single stratum of tile and ceramic products enters the kiln. This reduces the time of second firing from 16 hours to 30 minutes ("fast firing"). Ceramic tiles produced by both processes are optionally decorated and fired again to obtain special decorations. The process is called a "**Third Firing"**, adopted to decorate very small quantities of tile and ceramic products. Porcelain stoneware tiles are polished instead of being glazed.

Technical opportunities for vertical disintegration allow that the twice-firing production process can in principle easily be split up after the grinding operation, first firing, the biscuit sorting, the second firing and the third firing; but problems of transport make it impossible to separate

pressing from the first production line from the pressing to the firing operation, and after the firing.

These technical opportunities for separating the various operations in both processes have indeed been partially exploited. They are also a stimulus to vertical disintegration that results in cost advantages. The advantage may vary based on the product and the process of specialization that differ from country to country.

The relative shares of the output of single fired and twice-fired tiles have radically changed both in Italy and in Spain in the last twenty years. Single fired tiles production started and widely increased during the 1970s, now represents about 70-72% of the total output, whereas twice-fired tiles, which represented until the mid 1970s and of the then predominant type ceramic tile, are now at about 20% of the total.

The remaining types of products are extrude tiles (obtained by the extrusion process, both with single- or twice-firing), and porcelain stoneware, an emerging type of product[1].

3.2. The Ceramic Tile Industry in the Three Counties**

Italy and Spain are the major European producers and exporters of ceramic products in the world. According to the TCPSC, the Ethiopian Ceramic Product is next to the Italian and the Spanish

[1] From a technical point of view, ceramic tiles might be classified, according to the European standard, in to different categories according to the water absorption capacity and the process of shaping (by pressing or extruding). However, economic data based on that classification are not available and hence it will not be used in this study.
** The details are as per Margherita R., Peter B., Emilio C, Francois L., and Franscisco M, 1996, and TCPSC

ceramic products in terms of price. The price of the Ethiopian ceramic product is less than the two European countries but higher than the rest of the countries like China, India that export ceramic products to Ethiopia. However, the Turkish and the Egyptian ceramic products are the most expensive in the Ethiopian market. Hence, it is worthy to explore the general practice of the Italian and the Spanish ceramic firms/industries while analyzing the competence of the local ceramic firm, TCPSC in the domestic market.

The disparity in the prices arises between the Ethiopian, and the Italian and the Spain products because of the divergence in the design of the ceramic products. The Ethiopian ceramic products have regular design. This is because of the dearth of a skilled designer required for a recurrent change of the design of the ceramic products in response to demand.

3.2.1. Italy

3.2.1.1. History

Italy started production of ceramic tiles at large-scale in the end of the 1940s. Thereafter, its production increased rapidly, especially, in the period 1960-80, which witnessed the increase of output from 37.8million m^2 in 1960 to 355 million m^2 in 1980 (Margherita, Peter, Emilio, Francois, and Franscisco, 1996). In the same period, the proportion of the exports went up from 3.5% in 1960 to 45% in 1980. This gave Italy a clear lead in the world market.

In particular, the 1960s and 1970s witnessed an easy entry by many new firms into the ceramic tile industry (up to 509 firms by 1976), both because of the initial investment required for a factory of minimum efficient size was – at the time- very low and because the know-how was not

difficult to acquire. The crucial factor in the development of ceramic tile production has been the increase in both domestic and international demand. The sharp increase in domestic demand was induced partly by changes in the Italian housing legislation of the early 1960s.

In 1994, Italian firms produced 510mln m^2 of ceramic tiles. One hundred ninety firms in industrial districts formed by ten Communi in the province of Macedona and Reggio Emilia produced almost 80%, while other 21 firms of the Romagna region produced less than 9% and the 134 firms outside the region (mainly Lazio and Campania) produced 11%.

The main factors in the development of ceramic tile production in the industrial district have been the following:

a) Easy access to raw materials (different kind of clays) in the mountains in that area;
b) An abundant labor force owing to the depressed conditions in that area during the 1950s;
c) Long and medium term credit facilities, lasting until the middle of the 1970s, for new enterprises in the depressed areas.

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These factors have induced a peculiar development process strongly marked by the interrelationships between ceramic tiles and producers of the machines for the ceramic tile industry that grew in the district.

3.2.1.2. Industry Structure, Employment, Markets

In the last forty years, output and labor productivity have increased continuously, while the number of firms and employees has decreased, mainly in the district.

The majority of ceramic tile firms have had less than 100 employees and the main products are single firing, twice firing, and porcelain grès. Since the middle of the 1980s, the overall increase in production has been largely due to the increase in single firing tile production, which has become the main kind of tile produced. A significant increase in unglazed porcelain tiles has been registered in the last five years.

Italian firms are exporting medium-high price ceramic tiles towards markets where Italian quality and design are much appreciated. The main export markets are Europe (mainly German and France), and America (mainly the United States).

3.2.2 Spain

3.2.2.1. History

"During the 1970's, after decades of slow growth, Spanish ceramic tiles production took advantage of the adoption of the most up to date firing techniques, which made it possible to widen the range of products. However, the significant change happened after 1980 when output almost doubled, employment decreased 13% and exports went up from 17% to 42% of output: a continuous increase in sales towards Europe and North America more than balanced the falling

share of sales in the Middle East, a traditional market for Spanish tiles", Aldovini and Fontanive, 1991.

Four main factors explain such important changes. First, "the resurgence of democracy has stimulated local developments policies, which favor small and medium size firms" (Benton 1990). Second, in 1980 the completion of natural gas pipeline in the province of Castellon made it possible to use a more suitable, low cost energy source for the single-firing technology, which was then emerging as an important technical change. Third, the presence of abundant red clay with low organic substances in Valencia region led to the production of good quality single-firing floor tiles, with a better efficiency than that in Italy. Fourth, the expansion of domestic demand from the building industry was a big stimulus, especially in the period of 1985-1988 when Spanish demand grew at a rate higher than the average for the building industry in other EU countries. This was the effect of two national government plans in favor of the public housing (1981-1983 and 1984-1987) and the resurgence of tourist activity.

The big technical changes introduced in the 1980s accompanied with an organizational changes internal to the ceramic tile firms and the birth of new firms owned by entrepreneurs with previous experience.

3.2.2.2. Industry Structure, Employment, Markets

In 1994, there were 185 Spanish firms producing 320million square meters of ceramic tiles. The size of the ceramic firms is quite small: almost 80% of them have fewer than 100 employs and only eight firms have more than 500 employees.

Traditional twice-firing tiles, which in 1980 were the only type of product, has now a small share of total output while fast twice-firing has an increasing share, the most important product being single-firing. Almost 5% of outputs are extruded.

Before the last ten years, after an increase in domestic sales, there has been a slowdown until 1994; in 1995-96, the increase in investments in housing suggests a probable upturn in domestic demand for ceramic tiles.

The export share of Spanish ceramic tile sales has increased up to 50% of sales before the last ten years before and the main export markets are now EU mainly France, the United Kingdom and Germany, and the United States. In 1994, it exported 158.4 million square meters.

3.2.3. Ethiopian Ceramic Firm

3.2.3.1. History, Industry Structure, and Employment

Ethiopian Ceramic Firm is an infant industry. The industry now aged not more than 11 years. It is located at about 195 km away from the major raw material supplying district. It started production in 1998. Since then, it has been engaged in the production of ceramic tiles, sanitary wares, and tablewares, and has been supplying the domestic market. It has never been engaged in export.

The firm's maximum production was in 2008, which amounted to 3295.1 ton of ceramic products. The minimum production of the firm was in 1998, at the beginning of the firm's operation, and was 1172 tons. The operation of the firm has never been consistently increasing

since the firm started operation. Output showed a significant fluctuation beginning 1998 to 2002. The highest drop in output was realized in 2002 with a total production of 1195 tons. There is a persistent increase in output since 2003. However, the performance of the firm is still low compared to its capacity. It has so far utilized 50%, 17% and 33% of the production capacities of the tile, the tableware, and the sanitary ware lines, respectively.

In 2003, the firm divested its tableware production line. It installed a new machine with a high capacity to produce insulating caps in 2008. It started to produce insulating caps. It supplies the product to Ethiopian Electric Power Authority.

Currently, the Ethiopian ceramic firm employs 621 workers on the three lines of the firm.

The analysis of the capacity utilization rate of the firm shows that the firm has never operated at its full capacity since its establishment. The capacity utilization rate varied with time and the production lines. Accordingly, the firm's maximum capacity usage occurred in 2007 with the utilization rate of 69% and 77% of the attainable production capacity of the ceramic sanitary ware and tiles production lines, while using only 23.95% of the tableware / insulator production line. The minimum capacity utilization 16.31% in 2003, 12% in 2007 and 1998, and 5.6% in 2004 for the ceramic tile, sanitary ware and tableware lines, respectively. The firm's capacity utilization trend was very fluctuating. INSERT Table 11and figure 1 and 2)

4. Ceramic Production in the Domestic Market

4.1. Value Chain Analysis

A "Value Chain" is a linked series of value added activities in an organization or an industry, Austin Associates, 2003. It is based on the separation of the economic activity in its particular value-adding activities, Porter 1985. INSERT Table 2

Porter suggested that the activities could be grouped into two primary and secondary activities:

1. **Primary activities:** activities that are directly concerned with creating and delivering a product. They include inbound logistics, operations (production), outbound logistics, sales and marketing, and service (maintenance).

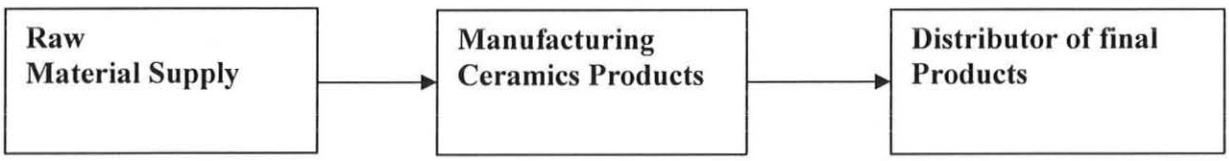
2. **Support activities:** activities that are not directly involved in production, but may increase the effectiveness or efficiency. They include administrative and managerial infrastructure, human resources management, R&D, and procurement.

For each activity, the costs and the value added are identified with the objective to maximize value creation for costs. In a value chain analysis not only the performance of a single value-adding activity, but also its coordination and interaction with the whole value chain is important (cp. Kotler and Bliemel 1999, referred to in Jürg Friedli 2002).

The interconnection of value chains of a whole supply chain is known as "value system" (Porter, 1985). Value system analyses the different economic actors' management of their individual value chains. A value system can be of global extent.

Accordingly, it is possible to construct the value adding system of the Ceramic firm. The following diagram presents the value adding chain of the ceramic firm.

Fig 3. Value Adding Chain of Ethiopian Ceramic Firm



The value chain here aims at providing an example of the price mark up on TCPSC products before and after they leave the firm for the market. TCPSC produces three typical items. The prices of the items produced vary with the items. Moreover, the prices are fluctuating, inconsistent and are variable with the input cost and over time.

Private and state owned companies from the mineral mining center, located in the countryside, supply raw material to the manufacturer, TCPSC. The manufacturer processes and converts the raw material. It accesses the market both directly supplying the product by engaging itself in wholesale, and the retailing activities. The firm charges the same price for a wholesaling and retailing. The transport cost makes a difference between the price at the gate of the firm, and its wholesaling and retailing centers. Currently, the firm uses a distributor. The price of the product at the distributor is higher than the firm price by 8-10% (as per the TCPSC). In this way, the distributor collects commission, and the final product enters in to the market. The highest value adding occurs at the stage of operation. The operation stage is the production stage that involves the conversion of raw materials into production.

4.2. Supply

4.2.1. Raw Material Supply

The Ceramic Firm requires non-processed and processed ceramic minerals as inputs. Kaolin, quartz, feldspar, Muger cement, muger clay, silica sand, limestone, ball clay (plastic clay), glaze, and gypsum are the non-processed and processed ceramic minerals used as inputs. In addition to these raw materials, electricity, water and kerosene are the major utilities that the firm needs for production.

All raw materials excluding ball clay are locally available and supplied. Muger Cement Enterprise is one of the raw material suppliers of the firm. It supplies cement, clay, silica sand, and limestone to the firm. The enterprise and the TCPSC have had long established linkage and business relation.

The ceramic firm imports ball clay (processed kaolin) and glaze (especially for tiles known as frit glaze, and opaque glaze for sanitary materials). The greatest innovative achievement of the ceramic firm is that it developed glaze, which serves as an important input and raw material for the production of tableware, through its research and development services. The ceramic firm produces and is self- sufficient in supplying glaze for making tableware.

Gypsum, which is important for molding purpose, is locally available. Two private companies and a state owned company, Ethiopian Educational Materials Manufacturing Agency supply the factory with gypsum. At present, the private suppliers supply low quantity gypsum because of

the diversification and conglomeration of their companies. The supply of gypsum from the state company is also low in both quality and quantity and is inconsistent.

Kaolin, feldspar, and quartz are the most important inputs required. Ethiopian Mineral Development Enterprise is a public enterprise responsible for the overall exploration, excavation, management, and sale of ground minerals in the country. It is the only supplier and has a monopoly power on the supply of many ground minerals. The enterprise supplies the ceramic firm with kaolin, quartz, and feldspar. The enterprise excavates the raw materials at about 274km south of the ceramic firm. Kaolin and quartz are found at Buambua Wuha area, and the pile of feldspar found at and excavated from Kenticha area. Both excavation quarters are located in the Ethiopian low land district known as Guji Zone in the Oromia Region.

Hosanna kaolin is an alternative kaolin mineral. Recently, three private companies began to supply the ceramic firm with this input. The companies excavate it from Hossana district. The excavation area is located at some 150 km west of the ceramic firm. Hosanna kaolin is cheap but of poor quality, unclean, unprocessed, and manually produced. However, the ceramic firm prefers to access kaolin from the Ethiopian Mineral Agency because their supply is processed and clean.

4.2.2. Ceramic Product Market

The Ethiopian markets for ceramics is served through both import and local production. TCPSC is the sole local supplier engaged in the production and marketing of ceramic tableware, sanitary ware and tiles with a designed annual capacity of 2000, 1000 and 3000 tons, respectively. The

plant also produces electric insulator cups for low-tension electric power distribution, refractory materials, and fine ceramic parts of high - tech equipment.

Supply through import consists of large number of importers, and several small intermediaries, that are involved either in direct importation of small consignments, or facilitation of the distribution of imported ceramic tiles and sanitary ware. Thus, importers can be sub - divided according to the price ranges of marketed products into high, mid and low price ranges. The high - price range importers deal with high quality products imported from countries such as Italy and Spain. Whereas, the mid - price range importers handle products imported from Iran, UAE, India and China, and their products are characterized by acceptable quality. There are also products imported from India and China that are in the low - price range market, and the products are of low quality and carry a low - price tag.

4.2.3. Market Concentration and Shares

Concentration refers to the extent to which a small number of firms or enterprises account for a large proportion of economic activity such as total sales, assets or employment. Various concentration indices or measures have been suggested in the field of industrial organization. These measures are used to describe market structure and/or as a prima facie indicator of **market power** or **competition** among firms. Essentially, concentration indices attempt to measure the number and relative size of inequality of firms.

Concentration Ratio is the most frequently used measures. It is the percentage of total industry output (or other such measure of economic activity, e.g., sales revenue, employment) in which a given number of large firms account for.

Three countries' imports dominate supply of ceramic product. Data from the Ethiopian Excise Authority and TCPSC shows that UAE, China, Ethiopia, and India supplied 94.96% of the total 3811 tons of sanitary ware products supplied to the local market in 2007. Moreover, the share of UAE, China, Ethiopia, and India are 35.21%, 23.87%, 18.02%, and 17.83%, respectively, and in the order of the concentration of individual supply. This indicates that import covered more than 82% of the local market. INSERT Table 3 and 4.

Similarly, for the ceramic tiles, from both the import and the local production indicates that China, UAE, Egypt and Ethiopia dominated the local ceramic tile market. It is 97% with a share of China, UAE, Egypt and Ethiopia being 52%, 26%, 16.09% and 2.5% respectively. INSERT Table 7 and 8.

4.3. Domestic Potentials of Ceramic Product Production

4.3.1. Availability of Raw Materials

Ethiopian Mineral Development Sharing Company (EMDSC) is a government owned mining company producing tantalite concentrate for export and kaolin, feldspar, quartz, and dolomite for the local industries. It is the sole government owned supplier of such raw materials as kaolin, feldspar, and quartz to the Ethiopian Ceramic Firm. It undertook an exploration to determine the country's kaolin, feldspar, and quartz mineral reserve. So far, it explored and confirmed that there

is about an accumulation of 225, 397 tons of kaolin, 501,000 tons of feldspar, and 55,000 tons of quartz reserve in the currently mining areas situated at about 274 km south of the ceramic firm. INSERT table 12.

Hence, EMDSC can supply an amount of 26, 209, and 17 folds of the quantity of kaolin, quartz, and feldspar, respectively, it supplied to the firm in the last 12years. Hence, there raw material availability safely promotes investment in the ceramic firm.

The rest of the raw materials except plastic clay and kerosene are available in abundance in the country and the quantity demanded by the ceramic firm for such material is low as compared to others. However, ball clay and kerosene are the main inputs required for production of ceramics, and so the ceramic firm needs to import these raw materials.

4.3.2. Market Prospects

Housing is a necessity and has a direct and positive correlation with population growth. The study conducted by The Ministry of Urban and Works of the Federal Republic of Ethiopia indicated that to cater for the housing needs of the Ethiopia's growing population, which is growing by some 2million per annum, each year around 335,000 new housing units are required, of which some 85000 have to be in urban areas.

Moreover, the current housing and construction policy of the country encourages investors, individuals and the public sector to be involved in the housing construction industry. This market oriented economic policy has also allowed the free entry and operation of different political and

economic institutions to perform different businesses activities in the country. This has, in turn, pushed up the demand for non-economic and economic service providing institutions.

In addition, the projected yearly demand for ceramic tiles and sanitary wares for the coming 18 years beginning 2008, reveals that the demand will grow to 22,203, 203m^2 and 10,982.52 tons, respectively, for ceramic tiles and sanitary wares, by the year 2025. The gap between the demand and the supply will be 21,903,203.94 m^2 and 9,982.52 tons of ceramic tiles and sanitary wares, respectively, assuming that TCPSC will fully utilize its production capacity. (Industrial Project Service study on feasibility study of TCPSC)

Hence, based on the above information, we could conclude that the market prospect for the ceramic products is reliable.

5. Domestic Competitiveness Analysis

This section attempts to gauge the domestic competitiveness of TCPSC by generating the domestic competitiveness index. It, then, analyzes the dynamics and determinants of domestic competitiveness of the firm.

5.1. Domestic Competitiveness of TCPSC

5.1.1. Methodology and Data Source

The study follows the methods described in the methodology section to determine the domestic competitiveness index of the ceramic firm.

Domestic Competitiveness Index is an index that demonstrates the domestic competitiveness of a firm. It is represented by UC. Relying on the theory of firms, the research pursued the unit cost ratio approach to produce UC of the firm. The approach simply states that UC is the ratio of the total cost and the total revenue of the firm's operation, i.e. (UC= TC/PQ)

The research employs two types of variables to quantify the domestic competitiveness index of the firm: the total cost of production and the total revenue from sales of the product. Moreover, we collected the production cost and revenue data for the last ten years (June ending of 1999 to 2008) and the recent 42 months (INSERT Table 13) beginning July 2005 to December 2008 as well to determine UC of TCPSC. It exploited the latter data to generate UC on a monthly basis. The total cost used in here is exclusive of all opportunity costs of capital and depreciation.

5.1.2. Data Analysis

We calculated the domestic competitiveness index, UC, of the firm for the last 42 months beginning July 2005 – December 2008. UC takes a value between zero and infinity, ($0 < UC < \infty$). UC=0 implies that the firm operated with no cost which is very impossible. Moreover, UC=1 indicates that the competitive structure of the market, or the firm operated at breakeven. In our case, the index ranges between two extremes values with in which the domestic competitiveness of the firm swings in the months considered. The lowest and the highest values of UC have been determined at 0.19 in January 2006 and 2.56 in September 2006, respectively.

The index, UC, was greater than 1 for 38 months, 90.5% of the total 42 months considered in the study. This indicates that the firm sold all its products below its cost, and so was running at a loss

and was financially uncompetitive. The maximum loss the firm encountered was in September 06 when the UC was equal to 2.56. This can be interpreted as that, the firm incurred Birr 2.56 to get revenue of one Birr. In other words, the firm's production cost was 256% of its revenue in the month under analysis. On the other hand, UC was less than one in Jan 06, June 07, April 08, and December 08. This implies that the firm was making profit from its operation. The maximum revenue earned by the firm was at the minimum (lowest) domestic competitiveness index (UC=0.19) in January 2006. This means that the firm incurred Birr 19 to get Birr 100. In other words, this suggests that the production cost of the firm was 19% of its revenue. In most of the months, the index value is found clustered around 1 and 2 ($1 \leq UC \leq 2$). This implies that the firm was operating at a loss and incurring a cost at an average 1.5 times the revenue it obtained. Moreover, in June 2008, the firm operated at breakeven, UC=1. See fig 4 below.

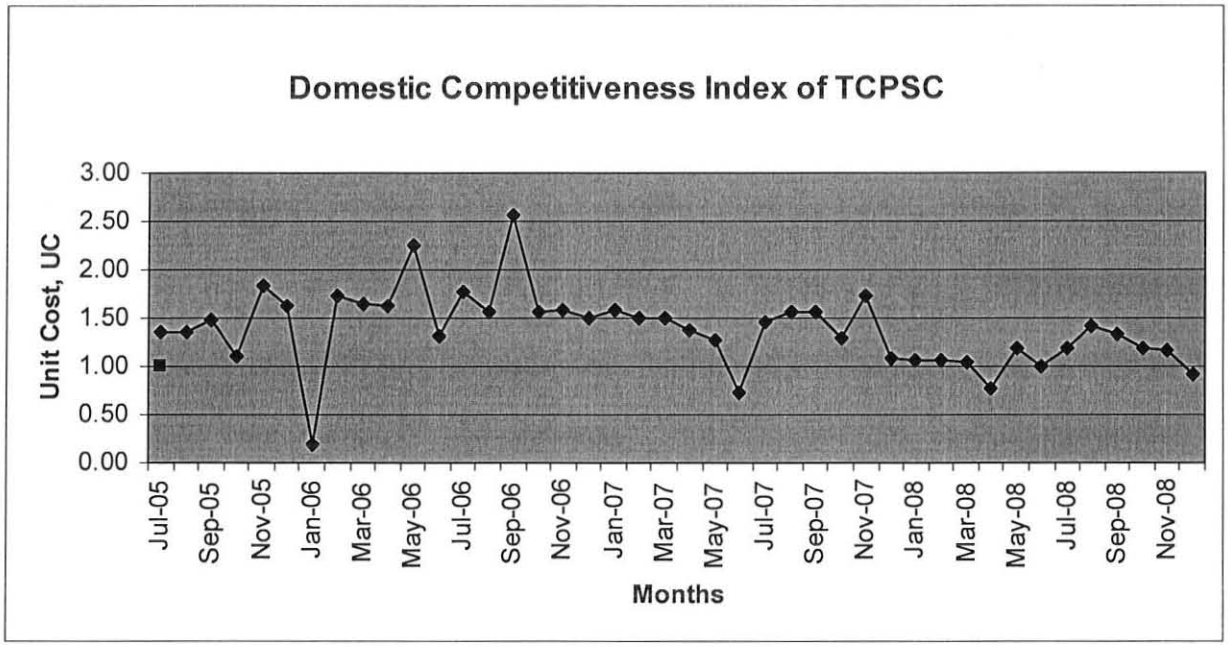


***Figure 4** Domestic Competitiveness Index*

The study attempted to show the distribution of the domestic competitiveness index of the firm in the months under consideration. Accordingly, the descriptive statistics shows that the mean and median of the index is 1.38 and 1.40, respectively. The variance of the index is 0.16 and the standard deviation is 0.3962. The Skewness and Kurtosis of the index found 0.02, and 2.58, respectively.

5.2. Dynamics of Domestic Competitiveness of TCPSC

Competitiveness is a dynamic concept. The purpose of analyzing the dynamics of competitiveness is to determine whether the factors affecting the past competitiveness are still affecting the current competitiveness of the firm. It shows the extent of the current competitiveness of the firm as dependent upon the past performance of the firm. Generally, the dynamics of performance signifies that the firm's specialization or diversification and the trade patterns.

"The general conclusion in theoretical and empirical literature about international trade specialization is that advanced economies are expected to have stable trade patterns" (Krugman, 1987), "while high degree of change in specialization is the feature of catching-up economies" (Beelin and Vespagen, 1994).

5.2.1. Methodology and Data Source

Domestic Competitiveness index is highly skewed and it takes the value between zero and infinity. This means that when it is used in regression analysis, the index may produce unreliable

t-statistics since the assumption of normality is violated. Hence, we normalized the domestic competitiveness index, which is symmetric index of domestic competitiveness and represented as UCs. It is closer to normal than UC. Thus, we used UCs and applied the regression model where the dependent variable represents an index in the final period and the explanatory variable is the same index in the initial period to determine the dynamics of competitiveness. That is, the symmetric index of domestic competitiveness (UCs) of the firm at one month is regressed on UCs of the initial month. The following equation presents the formula to compute UCs,

$$UCs = (UC - 1)/ (UC + 1) \quad \ldots\ldots\ldots\

been between successive periods: $\beta=1$ corresponds to unchanged patterns. More interpretations that are specific are the following:

• If $\beta>1$, the firm has increased its level of specialization. This implies that the current competitiveness is more dependent on the past. The firms innovation and new methodology introduction in order to expand its production and improve its competitiveness is low.

• If $0<\beta<1$ – the existing trade pattern changes: on average, the specialization decrease;

• If $\beta<0$, there is a negative relation between the past and the present competitiveness. This indicates that there is a change in the innovation and introduction of new methodology but it is a completely different one from the past. Whereas, $\beta = 0$ implies that there is no any relation between the current and the past competitiveness or there is no any dependency of the current competitiveness on the past.

5.2.2. Data

The domestic competitiveness index, UC, of the ceramic firm determined over the last 42 months beginning July 2005 – December 2008. The study normalized and used the index to investigate the dynamics of the domestic competitiveness of the ceramic firm. UCs symbolizes the normalized domestic competitiveness of the ceramic firm and is the symmetric index of domestic competitiveness. UCs takes a value between -1 and +1. Smaller value of UCs indicates competitiveness and profitability. Table 13 shows the values of UCs.

5.2.3. Results of Regression

The study undertook one regression analysis. The regression equation (2), UCs for the last period as a dependent variable regressed on UCs for the previous period as an explanatory variable. Table 15 shows the results of the regression. INSERT Table 14

The interpretation of the regression is provided as follows: -

As shown on the table 14, the regression parameter ß=.0299 is not significantly different from zero, that is $0<ß<1$ implies that the existing trade pattern changes. It shows that the trade pattern of the firm is not stable. It is changing. In the other way, the current competitiveness of the firm is not dependent upon the past. The firm is using different innovations and new methodologies than the past in order to improve its competitiveness. The trade pattern on average is not of highly concentrated.

Moreover, Prob > F = 0.8547 is not significant and implies that the Ho: the current and past competitiveness has direct and positive role in the dynamics of competitiveness of ceramic firm is rejected. INSERT Table 14, the results of the regression.

The study has undertaken a unit root set with a null hypothesis that there is a non-stationary of the domestic competitiveness across time in the designed model. The DF (Dickey Fuller) test result at 1% critical value indicates that at sample size T=50 the DF test result is -3.641 which is higher than the critical value (-3.58) without trend, and hence, the null hypothesis is rejected.

5.3. Determinants of Domestic Competitiveness

Determinants of firm level competitiveness include but are really not limited to the following: impact of openness of the economy, productivity, infrastructure, labor issues including HIV/AIDS, of currency depreciation, administrative, legislative and institutional sector reforms, deregulation, privatization, encouraging exports and a general liberalization of the Nigerian economy, 'E Onyemenam Chris, 2004, Firm Level Competitiveness in Nigeria.

Access to finance is the second most important constraint at firm level competitiveness in Nigeria, experiencing working capital shortages, E Onyemenam Chris, 2004, Firm Level Competitiveness in Nigeria.

Similarly, the entrepreneur (the management body of TCPSC) suggested that factors that influence the domestic as well as the international competitiveness of the ceramic firm embraces skilled labor, finance (dearth of working capital), management, imported input like Kerosene, productivity, and the likes. These factors are the determinants of the firm's competitiveness when there is a high demand for its ceramic product under the existing technology. Currently, the firm mentioned that there is a huge volume of order to its product by its customers; nevertheless, it cannot deliver because of the above-mentioned constraints.

We considered labor productivity and working capital as the major determinants of the firm's competitiveness in the model. Finally, we investigated the impact of labor productivity and working capital on the domestic competitiveness of the ceramic firm.

5.3.1. Methodology and Data Sources

The research generated the annual domestic competitiveness index, UC, from the last ten years (June ended 1999 – 2008) production cost and revenue data. It normalized the annual UC and determined the domestic competitiveness index symmetry represented as UCs. Then, it employed UCs to analyze the impact of the above mentioned different determinants of the firm's competitiveness. INSERT Table 15

To investigate the impact of the determinants, the research followed an ordinary least square (OLS) regression method. The normalized competitiveness index regressed on the determinants and the regression parameters determined accordingly. It has also tested the null hypotheses the labor productivity and working capital are not determinants of the domestic competitiveness of ceramic firm in the domestic market.

The study formulated the OLS regression equation as follows:

$$UCs = \alpha + \beta_1 L + \beta_2 WC + \xi \quad \ldots\ldots\ldots\

5.3.2. Results of the OLS Regression, INSERT Table 16

The OLS regression result shows that β_1=-.0583987. This implies that there is a negative relation between UCs and labor productivity. A unit increase in the labor productivity will reduce UCs by 0.0584.

In addition, β_2= -1.02e-09 and is not significant. This implies that working capital and UCs have no relationship. The working capital insignificantly influences the competitiveness.

The constant term, α is 0.7355. This implies that whenever labor productivity and working capital are zero, UCs, the symmetric domestic competitiveness index of the firm is equal to the constant term.

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The t-test statistics shows that the null hypotheses, Ho, is rejected suggesting that labor productivity significantly affects the competitiveness of the ceramic firm and it is accepted that the working capital affects the ceramic firm competitiveness insignificantly.

The F test statistics, Prob > F = 0.0001, indicates that the regression parameters are significant and it rejects the hypotheses that all regression parameters are zero or insignificant.

R^2 = 0.9385 indicates that about 94% of the dependent variable, UCs, is explained by the independent variables, WC and L.

6. Conclusion and Recommendations

6.1. Conclusion

The Ethiopian Ceramic firm, TCPSC has three production process (lines): tile production line, sanitary ware, and tableware production lines. This gives the firm an opportunity to share overhead costs among the production lines and enable it enjoy economies of scope.

The firm was established under the IS industrialization strategy of the country in 1996. The primary objective of the firm is to serve as a source of ceramic products to the local market, an import substitute firm and thereby, to export ceramic products to the international market. Market information of the firm proves that the firm has never experienced export of its products to the world market. Hence, as in the rest of the countries, for instance, in Latin America, and Kenya, which have undergone through IS industrialization strategy for their industrial and economic growth, the Ethiopian IS industrialization strategy in the ceramic production sector in particular has failed to meet its objective.

The domestic competitiveness index generated for 42 months of the ceramic firm operation showed that the index is below one only for four months. This indicates that the firm was financially profitable and competitive only for four months. That means for more than 95% of the months considered in the study, the firm operated under loss. This suggests that the domestic ceramic firm is uncompetitive.

The result of the regression shows that the current competitiveness of the firm is not dependent upon the past. In addition, the firm's trading pattern is changing and it is not stable. The firm is

using different innovations and new methodologies than the past in order to improve its competitiveness. That is, the specialization of the firm decreased in the tiles and sanitary wares production lines in the last three and half years. Hence, it seems that the firm is increasing its production of insulating caps and the firm believes that this production line is profitable. INSERT Table 11

Moreover, the OLS regression analysis indicates that labor productivity is the major determinants of the competitiveness of the firm.

Concentration ratio computed for ceramic sanitary ware product supply in the domestic market shows that UAE, China, Ethiopia, and India supplied 94.96%, and the import shared 82% of the supply in 2007. Similarly, China, UAE, Egypt and Ethiopia supplied 97.10% of the Ethiopian market in 2007. Import and local production share was 94.67% and 2.47% of the local market, respectively. This indicates that import takes a highest share in the local market. Hence, this affects the current account balance and aggravates the trade deficit of the country.

EMDSC proved that Ethiopia has a huge concentration of minerals required for making ceramics. The current mineral exploration of EMDSC assures that the existing concentration of kaolin, and quartz is 26, 209, and 17 folds of the amount it supplied to the firm in the last 12years. Hence, the raw material availability safely promotes investment in the ceramic sector.

Moreover, the population growth and its consequent demand for housing, the firm's unutilized production capacity, and the projected demand for the ceramic products are the potentials for investing in the ceramic industries in the country.

Experience of the Italian ceramic product growth thought that countries housing legislation, easy access to raw materials, an abundant labor force, and long and medium term credit facilities are the main factors contributed for the development of the ceramic products. Moreover, the resurgence of democracy, low cost energy source, technical changes accompanied with an organizational changes internal to the ceramic firms and the birth of new firms owned by entrepreneurs with previous experience are told as the major factors that has brought in the development of the Spanish ceramic industry. China ceramic industry growth is the outcome of the interwoven connection between ceramic producers and ceramic producing machine producers. Thus, our ceramic firm lack many of the above stated factors contributed for the development of ceramic sectors in the other countries. Hence, our countries ceramic sector remained uncompetitive.

6.2. Recommendations

Based up on the above conclusion, we provide the following recommendations in order that this firm in particular and the sector as a whole would become competitive:

1. TCPSC should improve the labor productivity of the firm. Proper management support especially on timely supply of raw material is required in order to increase the efficacy and the efficiency of the labor.

2. Provision of incentive and improving the skill of the technical labor in order to enable workers deploy their past cumulated and newly acquired knowledge in the sector. This will also increase the labor productivity.

3. Reduction of support and administrative costs is also the other recommendation that we want to put. However, we, hereby, also recommend a further detailed study regarding the affect of such costs on the competitiveness of the firm.

4. The current financial access and source of working capital to the firm is largely dependent on customers advance payment and bank over draft services. This does not seem sustainable source to make the firm competent. Hence, Government should provide access to long and short-term credits to the firm in order that the firm would able to improve its raw material access.

5. The firm should attempt to operate at its full capacity to reduce its production cost and enjoy economies of scale.
6. The government, as it is the highest supervising body of the building designs and constructions in the country and involves in the approval of construction materials as well, should provide its own support on the marketing and advertisement of the firm's product as it is the huge buyer of the ceramic products too.

7. The countries natural potential and the current explored raw materials for ceramic production are enormous as compared to the ever-growing demand for ceramic products. Currently, as per the Investment Authority of the country, about 26 new investors are

under pre implementation stage to engage in ceramic production in the country. Thus, these investors should be provided with the necessary supports in order to increase the local ceramic production and effectiveness of IS ceramic firms. This, on the other hand, will reduce the trade deficit of and thereby, increase foreign currency saving in the country.

8. Experience of Italy, Spain, China and Others in industry location, government support, the factors that contributed for the growth of the ceramic sectors etc. should be learnt and implemented whenever necessary. Along with this, a detailed economic analysis support should be provided to especially the new arrival investors joining the ceramic sectors. Moreover, backward and forward industry / firm linkage as well as industry-clustering strategy of industrialization should be implemented when deemed necessary in order to improve the competitiveness and meet the objective of IS firms.

9. Provide economic advises through Investment Authorities and other concerned government agencies to those investors interested in joining the IS ceramic sectors to avoid establishment of large and capital intensive firms. Moreover, advice investors to lean on investing many small firms, which are of high-speed machines and labor intensive as these firms contributed a lot to the growth of the China economy and its ceramic sector.

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Table 1

Results of Macroeconomic Policy in 41 Developing Countries Depending on Trade Orientation

	Real GNP growth		ICOR* (annual average)		Inflation		Industrial Export	
	1963-73	1973 -85	1963-73	1973 -85	1963-73	1973 -85	1963-73	1973 -85
Strong Export Orientation	6.9	5.9	2.5	4.5	4	7.5	14.8	14.5
Weak Export Orientation	4.9	1.8	2.4	5	4.1	4.6**	18	14.7
Weak Import substitution	3.9	1.83	3.3	6.2	3.5	11	11	8.5
Strong Import substitution	1.6	-0.1	5.2	8.7	4.6	13.5	5.2	3.2

Source: World Development Report 1987, World Bank.

* ICOR is the ratio of the share of investments in GDP to GDP growth rate. The co-efficient shows the efficiency of investments (the lower this indicator, the more efficient investments).

** High level of inflation in the group of moderate export orientation in 1973-85 explained by the fact that those four countries (Brazil, Israel, Turkey and Uruguay) out of eight countries in this group faced very high or hyperinflation in that period.

Table 2

Model of the Value chain

Support Activities	Firm infrastructure	**MARGINS**
	Human resource management	
	Technology development	
	Procurement	
Primary activities	Inbound logistics	
	Operations	
	Marketing and sales	
	Outbound logistics	

Source: Porter (1989, p. 62)

Table 3

Total Supply (Apparent Consumption) of Ceramic Sanitary Ware (Tons)

Year	Imports		Local		Total Supply	Growth Rate
	Tons	% Share	Tons	% Share		
1998	1,026	89.92	115	10.08	1,141	-
1999	583	83.28	117	16.72	700	-38.65
2000	522	70.64	217	29.36	739	5.57
2001	507	57.05	382	42.95	889	20.3
2002	634	71.31	255	28.69	889	0
2003	1,199	79.62	307	20.38	1,506	69.4
2004	1,426	75.61	460	24.39	1,886	25.23
2005	2,380	81.07	556	18.93	2,936	55.67
2006	3,355	85.22	582	14.78	3,937	34.09
2007	3,123	81.95	688	18.05	3,811	-3.2

Source; Ethiopian Custom Authority as adopted from IPS on TCPSC feasibility study and TCPSC

Note that, since there is no record of export or re-export, the apparent consumption or total supply of ceramic sanitary ware is composed of domestic production plus import.

Table 4 . Import Share of Ceramic Sanitary Ware by Country of Origin (%)

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
China	5.35	6.92	1.91	-	1.02	0.83	2.40	8.53	28.15	29.13
Djibouti	-	0.01	0.01	0.01	0.01	0.62	0.03	0.27	0.03	0.15
Egypt	3.34	2.89	4.00	4.70	0.00	4.08	6.18	25.16	2.46	3.34
Germany	-	-	0.01	0.002	0.005	0.13	0.0005	0.01	4.89	0.003
India	15.98	18.53	27.27	32.14	25.41	35.70	51.48	22.98	21.41	21.76
Iran	-	-	1.44	-	0.05	-	-	0.25	0.01	-
Italy	55.72	16.26	24.20	12.89	9.28	5.24	3.87	1.90	1.57	1.17
Japan	-	2.29	0.37	-	0.23	0.03	-	-	-	0.10
Romania	-	0.004	2.38	5.30	6.83	1.25	1.68	0.02	-	-
S. Arabia	2.25	1.42	0.04	0.05	0.25	0.14	0.62	0.87	0.69	0.03
Spain	-	-	-	-	1.96	2.82	0.36	0.79	0.58	0.86
Sweden	0.02	0.46	-	1.27	-	0.00	0.66	0.16	.0001	-
Turkey	-	0.17	-	0.40	-	0.13	0.18	0.25	0.19	0.11
UAE	15.45	48.13	38.12	42.42	52.93	48.63	31.65	37.48	38.10	42.97
UK	-	1.33	0.004	0.08	1.45	0.09	0.82	0.00	-	0.004
Ukraine	-	-	-	-	0.15	-	-	0.16	0.56	0.003
USA	0.03	-	0.10	0.72	0.41	0.20	0.004	0.16	0.003	0.10
Others	1.86	1.58	0.13	0.00	0.02	0.10	0.07	1.01	1.37	0.26
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Ethiopian Custom Authority, adopted from IPS feasibility study on TCPSC

Table 5

Annual Production and Sales of Ceramic Sanitary Ware by TCPSC

Year	Production (Tons)	Growth Rate	Sales (Tons)	Growth Rate	Value (Birr)	Growth Rate
1998	115	-	65	-	927,552	-
1999	117	1.74	111	70.77	1,265,011	36.38
2000	217	85.47	272	145.05	2,641, 803	109
2001	382	76.04	429	57.72	3,258, 179	23.33
2002	255	-33.25	263	-38.69	1,976, 027	-39.35
2003	307	20.39	306	16.35	2,345,300	18.68
2004	460	49.84	388	26.80	3,190,996	36.06
2005	556	20.87	587	51.29	5,334, 241	67.17
2006	582	4.68	574	-2.21	5,534,511	3. 75
2007	688	18.21	709	23.52	7,366,482	33.10
2008	637	-7.41	573	-5.00	8,966,884	21.73

Source: *TCPSC*

Table 6

Import of Ceramic Sanitary Ware (Tons)

Year	Quantity	Growth Rate	Value (In Birr)	Growth Rate
1998	1,026	-	9,490,507	-
1999	583	-43.18	2,867,430	-69.79
2000	522	-10.46	4,072,369	42.02
2001	507	-2.87	3,788,885	-6.96
2002	634	25.05	5,623,206	48.41
2003	1,199	89.12	7,354,633	30.79
2004	1,426	18.93	8,213,710	11.68
2005	2,380	66.90	10,218,030	24.40
2006	3,355	40.97	18,754,338	83.54
2007	3,123	-6.92	18,840,324	0.46

Source: External Trade Statistics, and adopted from IPS

Table 7

Total Supply of Ceramic Tiles (m^2) in the Domestic Market

Year	Import		Local Production Sales		Total supply	Growth rate
	Quantity (m2)	Share (%)	Quantity (m2)*	Share (%)		
1998	194,586	77.29	57,180	22.71	251,766	-
1999	3,042,597	96.67	104,910	3.33	3,147,507	1150.17
2000	79,521	45.51	95,200	54.49	174,721	-94.45
2001	559,550	88.13	75,340	11.87	634,890	263.37
2002	2,372,701	97.75	54,500	2.25	2,427,201	282.30
2003	600,764	88.84	75,430	11.16	676,194	-72.14
2004	3,074,547	94.98	162,490	5.02	3,237,037	378.71
2005	4,456,374	95.16	226,480	4.84	4,682,854	44.66
2006	6,856,760	96.65	237,470	3.35	7,094,230	51.49
2007	8,136,631	97.53	205,900	2.47	8,342,531	17.60

*Source: Ethiopian Custom Authority, adopted from IPS feasibility study on TCPSC, and *TCPSC*

Table 8

Import Share of Ceramic Tiles (M^2) by Country of Origin (%)

Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
China	57.10	7.33	-	83.99	1.89	10.16	31.73	50.10	25.55	53.60
Italy	4.03	0.92	36.29	2.39	1.44	3.63	6.72	13.90	2.44	0.71
UAE	33.68	2.71	50.78	4.83	74.55	57.08	10.32	23.93	61.20	26.97
Bulgaria	-	0.13	0.19	3.57	0.21	-	0.20	-	-	-
Germany	-	83.97	-	-	5.61	-	9.11	-	0.05	0.60
Turkey	-	0.0004	-	0.83	-	0.47	0.00	1.99	0.09	-
Iran	-	4.73	-	-	1.89	9.00	26.33	0.45	8.18	0.20
Egypt	-	-	3.21	0.81	11.37	1.83	1.34	7.24	0.57	16.50
Singapore	-	-	1.36	-	-	-	-	0.10	-	-
Indonesia	-	-	4.46	-	-	-	-	-	-	0.001
India	-	-	-	1.46	1.65	11.13	5.00	1.61	0.52	0.76
Spain	-	-	-	0.74	0.83	5.50	8.22	0.15	1.11	0.25
Others	5.20	0.21	3.71	1.37	0.56	1.22	1.05	0.52	0.29	0.41
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Ethiopian Custom Authority, adopted from IPS feasibility study on TCPSC

Table 9

Annual Production and Sales of Ceramic Tiles by TCPSC

Year	Production (m^2)	Growth Rate	Sales (m^2)	Growth Rate	Value (Birr)	Growth Rate
1998	76,058	-	80,241	-	3,112,998	-
1999	73290	-3.63	57,180	-28.74	2,282,949	-36.36
2000	119000	62.37	104,910	83.47	3, 316,914	31.17
2001	89410	-24.87	95,200	-9.26	3,555,843	6.72
2002	83390	-6.73	75,340	-20.86	2,739,316	-29.81
2003	48940	-41.31	54,500	-27.66	1,985,445	-37.97
2004	120780	146.79	75,430	38.40	2,279,896	12.92
2005	157230	30.18	162,490	115.42	4,696,719	51.46
2006	212860	35.38	226,480	39.38	6,365,844	26.22
2007	231070	8.55	237,470	4.85	8,008,566	20.51
2008	210850	-8.75	205,900	-13.29	8,332,559	3.89

Source: *TCPSC.*

Table 10

Import of Ceramic Tiles (m^2)

Year	Quantity	Growth Rate	Value	Growth Rate
1998	194,586	-	2,336,224	-
1999	3,042,597	1463.63	9,432,213	303.74
2000	79,521	-97.39	5,429,043	-42.44
2001	559,550	603.65	6,138,505	13.07
2002	2,372,701	324.04	13,470,236	119.44
2003	600,764	-74.68	14,083,732	4.55
2004	3,074,547	411.77	27,130,410	92.64
2005	4,456,374	44.94	28,330,591	4.42
2006	6,856,760	53.86	47,583,778	67.96
2007	8,136,631	18.67	61,168,564	28.55

Source: *External Trade Statistics, adopted from IPS feasibility study on TCPSC*

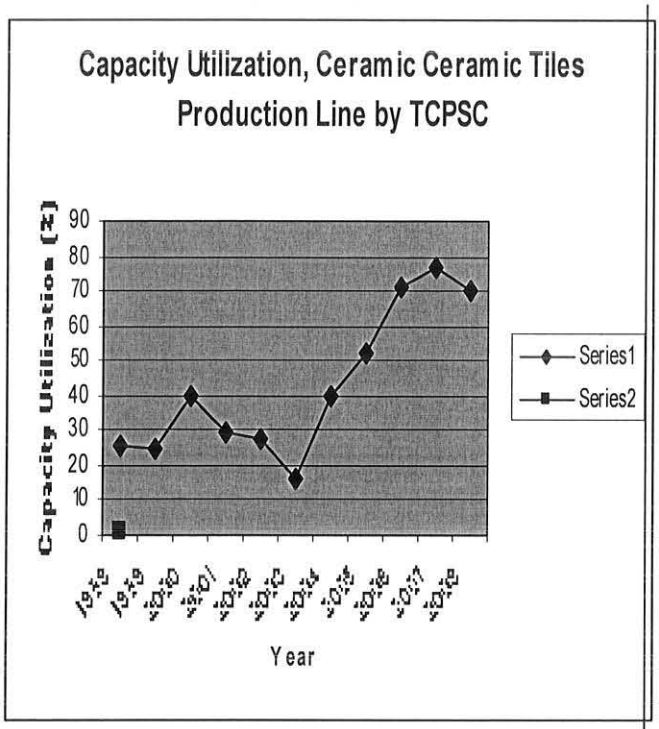
Table 11

Annual Production of Sanitary Ware and Tiles Vs Capacity Utilization, TCPSC

June Ending

Year	Tile Production Line			Sanitary Ware Line			Table ware / Insulators		
	Production (M^2)	Capacity	Capacity Utilizations Rate (%)	Production (tons)	Attainable Capacity (tons)	Capacity Utilization Rate (%)	Production (tons)	Capacit (tons)	Rat (%)
1998	76,058	300,000	25.35	115	1000	12		2000	
1999	73290	300,000	24.43	117	1000	12	322	2,000	16.1
2000	119000	300,000	39.67	217	1000	22	498	2,000	24.9
2001	89410	300,000	29.80	382	1000	38	308	2,000	15.4
2002	83390	300,000	27.80	255	1000	26	311	2,000	15.5
2003	48940	300,000	16.31	307	1000	31	399	2,000	19.5
2004	120780	300,000	40.26	460	1000	46	467	2,000	23.3
2005	157230	300,000	52.41	556	1000	56	612	2,000	30.6
2006	212860	300,000	70.95	582	1000	58	680	2,000	34
2007	231070	300,000	77.02	688	1000	69	348	2,000	17.7
2008	210850	300,000	70.28	637	1000	64	550	2,000	27.5

Source: *TCPSC*



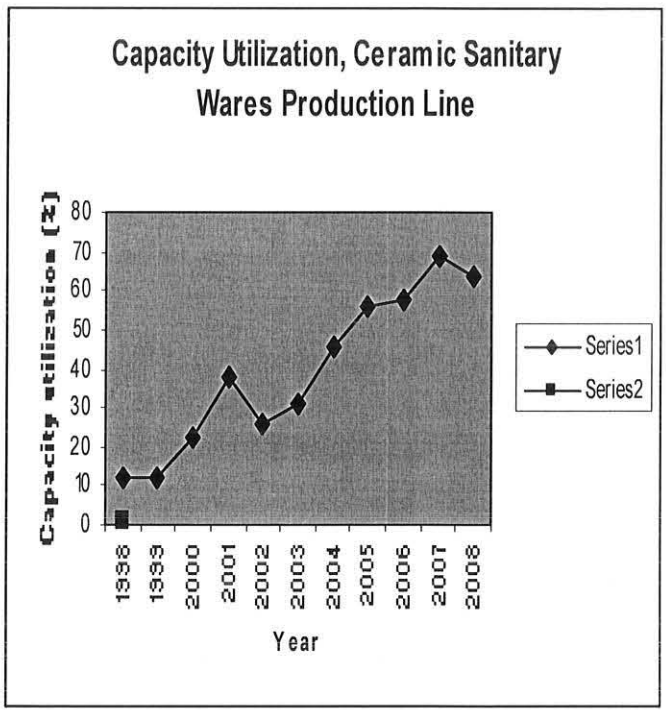


Fig 1. The above graph shows TCPSC's ceramic tiles production line capacity utilization. The capacity utilization rate is swinging, the maximum and the minimum being 77% and 16.31% in 2007 and 2003, respectively, and is below full capacity.

Fig 2. As can be seen from the graph, TCPSC has never operated at full capacity of the sanitary ware production line. The capacity utilization rate is fluctuating. The maximum and the minimum are being 69% and 12% in 2007 and 1998, respectively.

Table 12

Raw Material Supplied to TCPSC by EMDSC

Year End June 30	Raw Materials Supplied		
	Type	Qty (tons)	Value (birr)
1996 to 2008	Kaolin	8,606.64	5,133,505.10
	Quartz	2,401.49	1,357,886.62
	Feldspar	3,153.93	1,510,113.47

Source: Ethiopian Mineral Development Sharing Company

Table 13

Production Cost and Revenue of TCPSC, July 2005 -December 2008

	Month	Total Cost	Total sales	UC	UCs	Ucst-1
1	Jul-05	960406	712524	1.35	0.15	
2	Aug-05	1401377	1039257	1.35	0.15	0.15
3	Sep-05	1220515	822306	1.48	0.19	0.19
4	Oct-05	3033460	2726404	1.11	0.05	0.05
5	Nov-05	2557263	1399162	1.83	0.29	0.29
6	Dec-05	3280915	2019510	1.62	0.24	0.24
7	Jan-06	200600	1079174	0.19	-0.69	-0.69
8	Feb-06	2253202	1300964	1.73	0.27	0.27
9	Mar-06	3263367	1972512	1.65	0.25	0.25
10	Apr-06	2503202	1543993	1.62	0.24	0.24
11	May-06	2461781	1094800	2.25	0.38	0.38
12	Jun-06	3391000	2570619	1.32	0.14	0.14
13	Jul-06	2235702	1268031	1.76	0.28	0.28
14	Aug-06	2423822	1553035	1.56	0.22	0.22
15	Sep-06	2193288	857180	2.56	0.44	0.44
16	Oct-06	2318602	1475352	1.57	0.22	0.22
17	Nov-06	2345702	1484258	1.58	0.22	0.22
18	Dec-06	2419036	1615750	1.50	0.20	0.20
19	Jan-07	2427245	1536441	1.58	0.22	0.22
20	Feb-07	2453209	1631035	1.50	0.20	0.20
21	Mar-07	2372314	1572258	1.51	0.20	0.20
22	Apr-07	2779692	2011688	1.38	0.16	0.16
23	May-07	3027000	2399122	1.26	0.12	0.12
24	Jun-07	3139737	4286473	0.73	-0.15	-0.15
25	Jul-07	2364203	1630813	1.45	0.18	0.18

26	Aug-07	1727754	1100847	1.57	0.22	0.22
27	Sep-07	2296500	1462717	1.57	0.22	0.22
28	Oct-07	2409600	1867064	1.29	0.13	0.13
29	Nov-07	2064709	1194726	1.73	0.27	0.27
30	Dec-07	3108008	2893766	1.07	0.04	0.04
31	Jan-08	3042874	2840268	1.07	0.03	0.03
32	Feb-08	2627384	2450087	1.07	0.03	0.03
33	Mar-08	2752554	2661227	1.03	0.02	0.02
34	Apr-08	2549325	3281289	0.78	-0.13	-0.13
35	May-08	2411761	2016407	1.20	0.09	0.09
36	Jun-08	4752124	4713222	1.01	0.00	0.00
37	Jul-08	2409885	2021823	1.19	0.09	0.09
38	Aug-08	1874412	1314666	1.43	0.18	0.18
39	Sep-08	1506494	1129911	1.33	0.14	0.14
40	Oct-08	2075335	1742497	1.19	0.09	0.09
41	Nov-08	2841843	2438110	1.17	0.08	0.08
42	Dec-08	2176542	2388038	0.91	-0.05	-0.05
			MAX	2.56	0.44	0.44
			MIN	0.19	-0.69	-0.69
			AVG	1.38	0.13	0.13
			MED	1.40	0.17	0.18
			VAR	0.156981	0.03103678	0.031807522
			STD	0.396208	0.17617259	0.178346635
			SKEW	0.019361	-2.54197502	-2.50834418
			KURT	2.580346	10.880541	10.56360956

Source: TCPSC

Table 14

Dynamic Competitiveness Stata Report

```
. tsset Month
Time variable:  Month, 1 to 42
. summarize
    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
       Month |        42        21.5    12.26784         1         42
   totalcost |        42     2420327    733561.7    200600    4752124
  totalsales |        42     1883793    859884.2    712524    4713222
DCompttIndex |        42    1.382143    .3960816       .19       2.56
DCompttind~m |        42    .1338095    .1766484      -.69        .44
. reg DCompttindexSymm DCompttindexSymmlag
      Source |       SS       df       MS              Number of obs =      41
-------------+------------------------------           F(  1,    39) =    0.03
       Model |  .001114047     1  .001114047           Prob > F      =  0.8547
    Residual |  1.2780079     39  .032769433           R-squared     =  0.0009
-------------+------------------------------           Adj R-squared = -0.0247
       Total |  1.27912195    40  .031978049           Root MSE      =  .18102
------------------------------------------------------------------------------
DCompttind~m |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
DCompttind~g |   .0299161   .1622513     0.18   0.855    -.298268    .3581003
       _cons |   .1292775   .0360933     3.58   0.001     .0562719    .202283
------------------------------------------------------------------------------
. reg e elag
      Source |       SS       df       MS              Number of obs =      40
-------------+------------------------------           F(  1,    38) =    0.02
       Model |  4.9794e-07     1  4.9794e-07           Prob > F      =  0.8970
    Residual |  .001113423     38  .000029301          R-squared     =  0.0004
-------------+------------------------------           Adj R-squared = -0.0259
       Total |  .001113921     39  .000028562          Root MSE      =  .00541
------------------------------------------------------------------------------
           e |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        elag |   .0211712   .1624034     0.13   0.897    -.3075972    .3499397
```

_cons	.1305804	.021691	6.02	0.000	.0866694 .1744915

. dfuller DCompttindexSymm

Dickey-Fuller test for unit root Number of obs = 41

---------- Interpolated Dickey-Fuller ---------

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-5.979	-3.641	-2.955	-2.611

MacKinnon approximate p-value for Z(t) = 0.0000

Table 15

Total cost and Total Revenue of TCPSC June Ending

Year	Production (tones)	No. of Production Workers	Productivity (L)	Total Cost (TC)	Total Revenue (TR)	Domestic Competitiveness Index (UC)	Normalized UC (UCs)
1999	1172	411	2.8504	28924680	6989150	4.1385119	0.61
2000	1834	409	4.4835	24394568	9038991	2.6988153	0.46
2001	1585	423	3.7464	22119466	8450981	2.6173845	0.45
2002	1400	450	3.1118	22159605	6233371	3.5549954	0.56
2003	1196	420	2.8468	20735261	7264140	2.8544687	0.48
2004	2135	413	5.1687	21652506	8395715	2.5789948	0.44
2005	2740	416	6.5873	25453352	13107553	1.9418843	0.32
2006	3391	428	7.9237	28231560	16142286	1.7489196	0.27
2007	3346	367	9.1177	27538957	19614622	1.4040014	0.17
2008	3295	373	8.834	33613766	23468725	1.4322792	0.18

Source: TCPSC

Table 16

Determinants of Competitiveness of TCPSC Stata Report

.reg UCs L WC

Source	SS	df	MS	Number of obs =	10
				F(2, 7) =	53.39
Model	.19524105	2	.097620525	Prob > F =	0.0001
Residual	.01279895	7	.001828421	R-squared =	0.9385
				Adj R-squared =	0.9209
Total	.208039999	9	.023115555	Root MSE =	.04276

UCs	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
L	-.0583987	.0066394	-8.80	0.000	-.0740984	-.042699
WC	-1.02e-09	3.27e-09	-0.31	0.765	-8.74e-09	6.71e-09
_cons	.735458	.0632803	11.62	0.000	.5858239	.8850921

Declaration

The project is my original work. It has not been presented for a degree in any other university and that all sources of materials used for the project have been duly acknowledged.

Written by;

Beyene Gizaw

Signature



Confirmed by;

Dr. Tekie Alemu

Signature

