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## **Export Potential of Cottage Industry: A Case Study of Sialkot (Pakistan)**

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### **Abstract**

Sialkot, the export city of Pakistan is earning \$900 million per annum by exports. The major exports are the sports goods, surgical instruments, leather products, martial art instruments, musical instruments and sports wear. All these products are value-added by cottage industry. How the export potential of cottage industry in Sialkot may be increased, that is the question. The current paper estimated the export potential of the cottage industry by measuring it through Cobb-Douglas production function. The data has been collected from 354 cottage industrial units selected by random sampling. The results explain that labor, capital, experience and education of entrepreneur, and working conditions enhance the export potential of the units. The labor is more used in cottage industrial units as compared to capital so the elasticity of export production with respect to labor is higher as compared to capital. The football making units and other sports goods producing units use a minor ratio of capital and largely depend upon labor for production. Although leather and surgical producing units use higher ratio of capital in production. The education and experience of the entrepreneur also lead to increased export production. The better working condition increases the export production by raising the productivity of labor. The study proposes the education and training of the individuals involved in cottage industry and provision of good working conditions by the Export Promotion Bureau, Sialkot Chamber of Commerce and Industry and vocational training institutes in their respective areas. The surprising results of the study are that credit availed by the units decrease the export production while distance to market from the unit raises the export production. The relationship between credit and export production explains the misutilization of credit while positive association between distance to market and export production explains the involvement of more number of household members in production in the units away from city as compared to the units situated near to market or city. The misutilization of loaning is needed to be checked.

**Keywords:** Cottage industry, Pakistan, Exports, Cobb-Douglas production function, Sialkot.

## 1. Introduction

Sialkot has international fame for its exports of sports goods, surgical instruments, leather products, martial art instruments, musical instruments and sports wear. Sports goods, surgical and musical instruments industries are more than a century old. The city is export-oriented hub and a nucleus of cottage industry. Almost all the manufacturing in these industries is exported to mainly USA and Europe under the band names of Nike, Adidas, Puma, Green Hill and a variety of other brands of surgical instruments, leather goods, leather wears, sports goods and sports wears.

There are more than ten thousand registered firms working in the city. Among them three industries are dominant i.e. of leather goods, surgical goods and sports goods. Sports goods exported from Sialkot are famous all over the world for their quality based on impeccable craftsmanship. Total exports of sports goods from Sialkot were amounted US \$ 76,189 thousands in 2008-09, and its share in the total exports was 1.46%.

There are more than 2800 firms manufacturing and exporting the surgical goods. The total world market for surgical instruments was US \$ 30 billion in 2008-09 and exports from Sialkot were US \$ 70920 thousands in 2008-09. The ratio of exports from Sialkot in the world exports of surgical instruments remained 4.23 percent and it had grown up by 34% from the previous year. Pakistan and particularly Sialkot is also an established name in the world for leather goods (leather gloves, leather garments, leather belts and other leather products). This sector contributes 6.5% to the total exports of Pakistan and provides employment to almost 250,000 people. The industry exported goods of worth of US\$ 104,497 in 2009-10.

Sialkot is exporting many other items like, Knives, Martial Arts, Cutlery, Musical instruments, Uniform Badges, Rice, Cotton rags and Nylon Goods, etc. It is earning more than US\$ 900 million per annum and the share reaches to 6% of the total exports of Pakistan. Mostly, these goods are produced in micro, small, medium and large firms. But all these are not produced under the in-house production facilities. Every exporter is backed up by local manufacturer called "*Maker*" (Ahmed, 2009). These makers also work as a middleman or subcontractors between exporters and local workers working in cottage industry. Cottage industrial units (CIUs) supply finished and semi-finished goods to exporters.

We will attempt to analyze the export potential of cottage industry of Sialkot in terms of export productivity of CIU through Cobb-Douglas and Transcendental production functions with explanatory variables of labour, capital, education of entrepreneur, experience of entrepreneur, life of cottage industry, availed credit, distance from market and working conditions of CIU. Export potential may also be affected by demand side factors like quality of product and price competition but we are looking into supply side factors to increase the export potential of CIU.

Cottage industry is not only important for under-developed countries but its importance has been equally felt in developed economies as well. It can play a vital role in the economic development of a developing economy like Pakistan. The major issues like unemployment and under-employment, balanced growth and the regional development may be tackled through it (Bahar, 2001). Cottage industry acts as a catalyst for transformation from lower level to high level of production. In many developing countries it has strategic importance through linkage with agriculture which in turn provides potential for progressive transformation of enterprises (Rubayat, 2009). Its importance can also be felt through utilization of massive manpower (Tarmidi, 2005; Brata, 2007; Ali, 2007). Analyzing the cottage industry of Sialkot may give some policy proposals not only to enhance the exports of Sialkot but also of other regions having cottage industrial base along with advantages of having elimination of regional disparity and declining unemployment and under-employment.

## **2. Theoretical Background, Model and Estimation Methods**

### **2.1. Theoretical Background**

Cottage industry is a primary source of income for both urban and rural lower-middle class of Sialkot. There are few analytical studies about cottage industries in this city but a plethora of reports exists. The literature explains that cottage industry requires small plants and less capital equipment because they heavily rely on abundant labour. Manual dexterity remains the focus of micro/small scale units and cottage industry with unskilled labor. The school-aged children and housewives participate in preparatory work. The work force participating in micro/small scale units usually comes from proprietor families. Another distinguishing feature of cottage industry is that it suffers from lack of sufficient capital, low access to markets, low technical and educational training, low levels of productivity and wages, low access to formal credit (Rubayat, 2009; Junejo, et. al. 2009). The distinguishing feature of cottage industry of Sialkot is that most of the goods produced are exported.

In the recent literature, Wu and Cheng (1999) analyzed the supply and demand side factors for export performance of China's Township Village Enterprises. They concluded that export performance is negatively related with unit labor cost, foreign direct investment and transaction cost but positively with financial assistance and educational level of labor. However, majority of the studies have measured the export potential through gravity model. For instance, Akram (2008) measured export potential of Pakistan through gravity model and pseudo maximum likelihood method. The study concluded that trade between two countries is negatively affected by tariff to trade, distance between two trading countries and conflict between two trading partners. While it is positively affected by common boarder and common language. Eita and Jordaan (2007) applied the same model to see the export potential of wood products from South Africa. GDP of the importer and exporter country, population of exporter country and same language (English) of both countries positively while population of importer country negatively affects the export potential. Abedini (2009) has also analyzed the export potential of car industry of Iran by the same model. The study concluded that GDP of importing as well as exporting country, common language between two partners, degree of justice and law and car production capacity of exporter positively affects the exports but distance between two trading nations and tariff level of importing country negatively affects the exports.

In our analysis the focus is export potential of cottage industry, that is not directly exporting the products but supplying it to the makers. So we have used Cobb-Douglas and transcendental function to see the export potential of cottage industry. Theoretically an increase in labor and capital may lead to raise the level of export production. Similarly education of entrepreneur and experience of entrepreneur affects the export production of cottage industry positively (Ezechi, 1999; Ali, 2007; Remi, 2010). As the entrepreneur is more educated and experienced he can fully utilize the scarce resources. He can well manage the business, inputs, accounts, production, etc. Conceptually age of the cottage industrial unit may also positively affect the export production as the unit has traced expansion path, attained the optimum combination of factors of production during the course of time and obtained experience in different jobs within the unit. Most of all, such units are more trusted by the exporters/middlemen.

Finance for cottage industry is an important ingredient for boosting production. Generally the cottage industry does not have reach to formal credit which keeps the production lower and the household involved in the industry in lower-income group. Empirically the availability of credit positively affects the cottage industrial production (Ali, 2007; Bahar, 2001). It is assumed that distance of the CIU from market negatively affects the export production due to non-availability of proper transport, finance, inputs and skilled labour. Lastly the working conditions, theoretically affects the export production of CIU positively. In the good working conditions efficiency of the workers is increased which leads to increased export production of cottage industrial unit.

### **2.2. Data and Model Specifications**

The empirical analysis is done by using cross sectional data collected from cottage industries of Sialkot through random sampling. We administered a questionnaire for the sample of 354 units of cottage

industry producing exportable goods and thereafter interview of the head of unit make the data available.

We have used Cobb-Douglas production function and transcendental functions to see export potential of cottage industry. The general form of Cobb-Douglas production function is given as:

$$Q = a X_1^b X_2^c$$

Where a, b and c are parameters while the general form of transcendental production function is given as:

$$Q = a X_1^b X_2^c e^{dX_1+fX_2}$$

Where e is a natural logarithm base, b and c are partial coefficients of  $X_1$  and  $X_2$ , respectively while d and f are trans-parameters measuring the variability of b and c in response to changes in production scale and input substitution. If d and f are zero, equation becomes Cobb-Douglas production function.

The Cobb-Douglas and Transcendental model of export production of cottage industry is shown in equation 1 and 2 respectively.

$$EPC = a LAB^{\beta 1} CAP^{\beta 2} EDU^{\beta 3} ACI^{\beta 4} CRD^{\beta 5} DIS^{\beta 6} EXP^{\beta 7} WRK^{\beta 8} u \quad (1)$$

$$EPC = a LAB^{\beta 1} CAP^{\beta 2} EDU^{\beta 3} ACI^{\beta 4} CRD^{\beta 5} DIS^{\beta 6} EXP^{\beta 7} WRK^{\beta 8} e^{\alpha 1 LAB + \alpha 2 CAP + \alpha 3 EDU + \alpha 4 ACI + \alpha 5 CRD + \alpha 6 DIS + \alpha 7 EXP + \alpha 8 WRK} u \quad (2)$$

Where

EPC = Export Production of Cottage Industrial Unit (Rupees)

LAB = Labour (Hours supplied by total labour force of a unit in a month)

CAP = Capital (Value of Physical Capital in Rupees)

EDU = Educational of Entrepreneur (Index of Years of Education<sup>1</sup>)

ACI = Age of Cottage Industrial Unit (Years)

CRD = Credit (Rupees)

DIS = Distance form Market (Kilometers)

EXP = Experience of Entrepreneur (Years)

WRK = Working Conditions (Index of Working Conditions<sup>2</sup>)

U = Error Term

For statistical estimation model is in natural logarithm form as shown in equation 3 and 4 for Cobb-Douglas and Transcendental Production respectively.

$$\ln EPC = a + \beta_1 \ln LAB + \beta_2 \ln CAP + \beta_3 \ln EDU + \beta_4 \ln ACI + \beta_5 \ln CRD + \beta_6 \ln DIS + \beta_7 \ln EXP + \beta_8 \ln WRK + u \quad (3)$$

$$\ln EPC = a + \beta_1 \ln LAB + \beta_2 \ln CAP + \beta_3 \ln EDU + \beta_4 \ln ACI + \beta_5 \ln CRD + \beta_6 \ln DIS + \beta_7 \ln EXP + \beta_8 \ln WRK + e^{\alpha 1 LAB + \alpha 2 CAP + \alpha 3 EDU + \alpha 4 ACI + \alpha 5 CRD + \alpha 6 DIS + \alpha 7 EXP + \alpha 8 WRK} + u \quad (4)$$

Where in both the equation a is the constant, term  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$ ,  $\beta_4$ ,  $\beta_5$ ,  $\beta_6$ ,  $\beta_7$  and  $\beta_8$  are slope coefficients of respective variables in equation 3 and 4 and term  $\alpha_1$ ,  $\alpha_2$ ,  $\alpha_3$ ,  $\alpha_4$ ,  $\alpha_5$ ,  $\alpha_6$ ,  $\alpha_7$  and  $\alpha_8$  shows the variability in  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$ ,  $\beta_4$ ,  $\beta_5$ ,  $\beta_6$ ,  $\beta_7$  and  $\beta_8$  respectively to a change in production scale or input substitution.

### 2.3. Estimation Methods

The OLS (Ordinary Least Square) has been used to estimate the equation 3 and 4. Because both the equations are log linear in parameters and also fulfill the other assumptions of CLRM.

<sup>1</sup> Education of entrepreneur is measured as five years of education is equal to one, eight is equal to 2, ten is equal to 3 and so on.

<sup>2</sup> Working conditions includes Availability of light, Fan, Safe drinking water, First aid and Building condition and one number is given to each facility for construction of index.

### 3. Empirical Results

#### 3.1. Results of Cobb-Douglas Production Function

The results of Cobb-Douglas production function are given in equation 5.

$$\ln EPC = 2.552599* + 0.644675*\ln LAB + 0.253975*\ln CAP + 0.173293*\ln EDU + 0.095924**\ln DIS + 0.293923*\ln WRK + 0.179513*\ln EXP - 0.009205\ln CRD - 0.018991\ln ACI \quad (5)$$

The parameters<sup>3</sup> shows that the labour, capital, education of entrepreneur, distance of market from CIU, working conditions of cottage industry and experience of entrepreneur positively affect the export production of cottage industry. The credit availed and age of CIU negatively but insignificant affects the export production of cottage industry.

Results of Transcendental production function are given in equation 6.

$$\ln EPC = 2.972721* + 0.626075*\ln LAB + 0.276811\ln CAP + 0.029957\ln EDU - 0.099056\ln DIS + 0.593381***\ln WRK + 0.074206\ln EXP - 0.011093\ln CRD - 0.081273\ln ACI + 4.73E-05LAB - 1.96E-06**CAP + 0.043851EDU + 0.013810**DIS - 0.115473WRK + 0.009082EXP + 1.82E-06CRD + 0.007637ACI \quad (6)$$

The parameters<sup>4</sup> of transcendental production function shows that only log of labour, log of working conditions of CIU, capital and distance of CIU from market significantly affects the export production of cottage industry. Remaining parameters are insignificant so we will consider only Cobb-Douglas production function.

#### 3.2. Measurement of Export Productivity

The export productivity of cottage industry (from Cobb-Douglas production function) is measured as

$$EPCI = [EPC/LAB]^{\beta_1} [EPC/CAP]^{\beta_2} \quad (7)$$

Or

$$\ln EPCI = \ln EPC - \beta_1 \ln LAB - \beta_2 \ln CAP \quad (8)$$

The model for export productivity of cottage industry is given in equation 9.

$$\ln EPCI = \alpha + \beta_1 \ln EXP + \beta_2 \ln WRK + \beta_3 \ln EDU + \beta_4 \ln DIS + \beta_5 \ln CRD + \beta_6 \ln ACI \quad (9)$$

The empirical results explaining the export production of cottage industry are given in equation 10.

$$\ln EPCI = 2.552599* + 0.179512*\ln EXP + 0.293923*\ln WRK + 0.173292*\ln EDU + 0.095924*\ln DIS - 0.009205\ln CRD - 0.018991\ln ACI \quad (10)$$

The parameters<sup>5</sup> indicate that the experience of entrepreneur, working conditions of CIU, education of entrepreneur and distance from market positively affect the export productivity of cottage industry. The credit and age of cottage industry negatively but insignificant affects the export productivity of cottage industry. The insignificant effect of the loan on export productivity explains the misutilization of loan.

### 4. Conclusion and Policy Recommendations

The study attempted to identify the factors affecting the export production and export productivity of cottage industry of Sialkot. The important findings are that the experience of entrepreneur, working conditions in CIU, education of entrepreneur and distance from market positively affects the export production and productivity of cottage industry. Labor (working hours) and capital also positively affects the export production of cottage industrial unit. The explanation may be that cottage industrial units heavily depend on labour that is why the elasticity of export production with respect to labour is very high. It may be concluded that production in CIUs is labor intensive and an increase in working hours leads to increase the export production of units. Amount of capital also positively affects the

<sup>3</sup> \* and \*\* represent 1 percent and 5 percent level of significance

<sup>4</sup> \*, \*\* and \*\*\* represent 1 percent, 5 percent and 10 percent level of significance

<sup>5</sup> \* represents 1 percent level of significance

export production of unit. The units producing footballs and other sports goods depend less on capital or machinery. On the other hand units producing leather and surgical goods depend equally on labour and capital. The increase in capital in these units directly leads to increase the export production of unit.

The increase in experience and education of entrepreneur leads to increase in export production and productivity of unit (see also Remi, 2010). The explanation is based on the fact that the educated and experienced entrepreneur can use the human as well as the capital resources more efficiently through division of labour, provision of better working conditions, etc. The educated entrepreneur can handle problems more professionally and competently. Similarly, working conditions in unit also raise the export production and productivity of unit. It explains the fact that in the presence of light and fan (particularly in summer season), workers can work longer hours in a day. The availability of safe drinking water, first aid box and satisfactory building conditions helps the workers to stay physically healthy and strong which leads to increase in export production and productivity of unit.

Conceptually the distance from market to unit should affect the production of the unit negatively based on a number of factors like the availability of inputs in the market, marketability of output, availability of technical hands, etc. In our case there is a unique result showing that the distance of the unit from market positively affects the productivity of the unit. It may be explained as in the households living near city few members of the families are working in cottage industries. On the other hand the households living at distance from the city, the more number of family members work in CIU and give more time for work.

The empirical findings have important implications for export production and export productivity of CIUs. First of all, Ministry of Commerce and Industry should make a comprehensive policy plan for cottage industry for technical support and education. Training and education of entrepreneurs should be increased through workshops and training programmes. It may be done through Sialkot Chamber of Commerce and Industry. Working conditions of the unit should be developed. Loans should be provided to the unit in order to improve the working conditions of unit. But these loans should be tied to proper utilization. The micro-finance bank, khushhali bank and commercial banks can play an important role.

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