The Effect of Geographic-Industrial Concentration on Export Decision of Iranian Industrial Firms

Mohsen Porebadollahan Covich and Mojtaba Hemmati

1Economic Lecturer of Tabriz University, Iran.
2Trade and Economic M.S Student in Tabriz University, Iran.

ABSTRACT

Background: This study provides a model for export decision of Iranian industrial firms with emphasis on geographic-industrial concentration. In this model, export decision of a firm is affected not only by firm characteristics but also by the location of the firm. In other words, if a firm operates in a geographic area, its existence affects positively the export decision of mentioned firm. Empirical results show that export decision of the firms is not only affected by firm characteristics (such as labor productivity, firm size and human capital intensity), but also the location of the firm (i.e. geographic-industrial concentration) has a significant effect on firms' export decision. That is, that exporting firms in a region that are involved in the same industry, reduce costs for other firms to enter foreign markets.

INTRODUCTION

Export which is actually defines as selling service or products to other countries and provides finance income for country is really important in providing commercial and economic balance and is vital for every countries economic development. Now day some of developing countries like Iran are intensely depended in staples like petroleum export income. In order to decrease economical dependency to staple export incomes, exporting other products should be put in center of consideration.

In order to find that whether well profiting firms become exporting ones or exporting firms become well profiting? People like Tybout (1998), Bernard and Jensen [13], Robert and Chung carried investigation different part of world and find that mostly well profiting institutes become exporting ones, there is little evidence for supporting that exporting institutes are become well profiting at last.

Any way there is a straight relation between firm positions and being exporting, firms during time find that their constant income growth is possible by selling their products outside the country. In another word different institutes for being successful can not only relay on internal markets and ought to develop their products to abroad markets. However at first these firms should improve their performance in order to be able to come across with additional charges and overcome exceeding competition. Different factor are effective in order to succeed in entrance in to abroad markets through export. These factors are divided in insider and outsider factors which insider factors are related in to firm and outsider factors are studied in whole.

In globalization trade and manufactures, some firms inter abroad markets to identify marketing opportunity and so offset reduction in internal market through this. Nevertheless despite high business attraction in abroad markets lots of firms are not eager enough to involve these markets and investigate their opportunities. The main reason of this issue could be related in high fixed entrance investment charges. Firms need special information in order to inter abroad markets. Researchers like Davidson and Erramilli believe that experience is a vital factor which ensures exporting firms success. Exporting experience from existing firms in region which are active in exporting particular products, by reducing irreversible charges do considerable help for firms which for first time managed enter international markets. Geographically firms are penetrating abroad markets, decline entrance charges for potential exporters, Specially exporting activity of one firm, decrease accessing charge to abroad market for other active firms in that region. Geographical concentration of exporters provides necessary constructions for transportation like storage, railway …and specially needed information about particular
products for costumers. These mentioned factors signifies important role of geographical-industrial concentration in firms exporting decision making which are studied in this paper.

This paper tries to study factors effecting firms exporting decisions. So for this considering information from industrial workplace at least with 10 members in Iran (2007), these firms different affecting factors are studies. Some of these affecting factors we could mention are firm size, labor productivity and human capital. Beside these factors firm local position is one of the effective factors in firms export decisions. In this paper special focus made toward geographical-industrial concentration factor which distinct this study from similar ones. The most important obstacle for Iranian firms for entering global markets and starting export is entrance charges which by increasing similar firms active in particular products export and increase geographical-industrial concentration, these entrance charges decline for the other firms and affects their export decision.

A review of research literature:
Different studies investigated effective factors of firms export decision, while a few of them considered local position of firms as an effective factor.

The theorical idea of centralization or industrial geographic concentrating for first time is mentioned by Marshal at economical thrifts of concentration theory. In this theory small firms while considered natural antagonists of each other, are members of an independent network. Effects of these concentrations could be considerable enough which perks of being in competition only justify in these concentrations. Because of novelty and instability in theory the concept of industries geographical concentration has kind of ambiguity in definition and application.

Studies discuss neighbor firms importance on export declare that neighbor firms exporting activity declines firm charges geographically and industrially to access export markets and do considerable help to overcome entrance charges in to abroad markets. Based on these studies firms which work actively in international markets get necessary experience and information which is not only improve their own exporting but also have grate effect on export decisions made by similar firms in that special region. So existence of exporting firms in one region and special industry greatly affects the other non exporting firm decision making, as existence of other firms in special region decrease entrance charges for new firms and exporting firms successes amplifies other firms tendency toward export.

Location related economic gains are imputed to Marshal. He believed that there are always outward gains for firms in special location and industry and local advantages are related to the characteristics of region and concentration special industry. Marshal declares that these local-industrial related characteristics provide knowledge and information potential for firms in a specific industry.

Henderson [23] states that export firms geographical concentration effect is because of knowledge and information about abroad markets.

Robert and Taybot [32] offered a dynamic model about export decisions of firms which in this model the primary charges are considered as an obstacle for export.

Aytakn and et al [8] are studied possibility of firms accessing to the local knowledge and information through international and internal exporters geographically and find that exporters provide useful information for other neighbor non exporting firms which these information could affect their export decisions positively.

Malemberg and et al are studied location advantages effects on Sweden export firms during 1994 and find that location advantages is effective on firms exporting behavior. They also found that urban and economic advantages are apart from industrial effect which is one of most important effecting factor on export. Exporting high performance is related to the exciting gains of operation. Firm size also could be considered another important factor in exporting firms performances. They also mentioned overwhelming effects of leader exporting institution which is considered as exceeding scale of operation.

Becchetty and Rossi by studying data from 3800 Italian industrial firm during 1981 till 1991 find that firm geographical concentration about understudy industries, increase export amount till 4 percent.

Carlsson [17] by studying Chinese firms find that geographical concentration of institutions in particular industry increase its attractiveness for exporters and encourage them to export these products.

Lovely [30] and et al using data from American basic institution at 2000 tested a hypotheses which declares that firms should be located at regions where concentration of exporting is high, and conclude that geographical concentration of export activities in exporting firms increase export ratio in compression with countries with complex trade market.

Alvarez [9] studies Chilean firm success in export and effecting factors in their performances and find that beside labor force craft and technological innovation which positively affect firm export, former export experience and increase in profitability also have positive effects on firm export.

Some indoor studies also investigated different factors affecting export but any of them did not mention geographical-industrial concentration role and this is our study’s distinctive difference from the others.
Research methodology:
In order to investigate the effect of industrial local position of firm aside the other factors (like firm size, labor productivity and human resources extremity) on firm export decisions we will use discrete regression method. So based on studies like those carried out by Johansson [25], research model is presented as follow;

\[ Y_i = \beta_0 + \beta_1 \text{ALP}_i + \beta_2 \text{SIZE}_i + \beta_3 \text{HCL}_i + \beta_4 \text{GCI}_i + U_i \]

\[ Y_i = \begin{cases} 1 & \text{if firm be the exporter} \\ 0 & \text{otherwise} \end{cases} \]

Where ALP represents labor force efficiency, HCL human resources extremity, SIZE symbolize firm size and GCI shows geographic-industrial concentration and index I represent firm.

Labor productivity:
Labor productivity measures the amount of goods and services produced by one hour of labor. In this study labor productivity is obtained by dividing the value added per employee and more than 10 on the number of employees of that firm.

Human Capital intensity:
In order to calculate human capital intensity, at first amount of human capital for every industrial work place is estimated and then this amount divided over number of this work place members. Human resources of every work place are number of people with college degree who are working there.

Firm Size:
In this research amount of industrial work place sale is defines as firms size.

Industrial-Geographical Concentration:
Industrial-Geographical concentration index is the most important factor of our research which represents local position of firm and for obtaining this factor, special codes which are representing geographical positions of firms are used so exporting and non exporting firms in every geographical region are classified. This classification of industries is based on ISIC codes. Local investigation is confined in to provinces. Based on Aitken [8], Alvarez [9] and Barrios [14] industrial-geographical concentration factor is defines as follow:

Industrial-geographical concentration = \frac{\text{total number of exporters in industry in whole country}}{\text{number of firms in special industry and region}} \times \frac{\text{number of whole country firms in that industry}}{\text{number of whole country firms in that industry}}

Industrial-Geographical concentration index could be zero or any positive number. If in special region (province) there is no firm from a distinct industry, this index would be zero. So existent at least one firm which active in this mentioned industry will increase this index. Table 1 shows provinces export privilege in different industries based on the industrial-geographical concentration index.

<table>
<thead>
<tr>
<th>Type of privilege</th>
<th>Industrial-geographical concentration index</th>
</tr>
</thead>
<tbody>
<tr>
<td>No privilege</td>
<td>0</td>
</tr>
<tr>
<td>Low privilege</td>
<td>0-1</td>
</tr>
<tr>
<td>Average privilege</td>
<td>1-1.5</td>
</tr>
<tr>
<td>High privilege</td>
<td>1.5-2</td>
</tr>
<tr>
<td>Grate privilege</td>
<td>&lt;2</td>
</tr>
</tbody>
</table>

Data:
Table 2 depicts descriptive statistic of research variables. Comparison of exporting and non exporting firms descriptive statistic in table 3 show that almost 8.8 percent of firms were exporting and all factors like firm size, human resources intensity, labor productivity and industrial-geographical concentration confirms previous findings. In this table average and mean value of all different factors based on whether the firm is active in exporting or not are presented. As we mentioned amount of sale express the size of firm which there is a big difference between exporting and non exporting firms. It means that exporting firms are major in size. About human resources intensities exporting firms have higher average and mean value. Also exporting companies got advantage of higher educated members. About labor productivity also these companies labor productivity is higher. Also about industrial-geographical concentration we see that exporting companies increase average and mean value of this factor.
In this study using STATA software Probit regression model is estimated and results are expounded and reported.

Before studying model, the elegance of extrapolated model must be evaluated. In probit regression using two elegance scale, model extrapolation is evaluated which the most important of them called LR. This scale acts like F statistic in common regression. This statistic chisq value with four degree of freedom is 688.38 and its probability is zero. So model meaningless hypotheses rejected and model considered meaningful and reliable. Another scale which is used for evaluation of model is called Likelihood. This statistics value is negative and whatever its absolute value is higher, it is more suitable model. For this model this amount is about -3619.8021, so based on this scale our model is meaningful and reliable too.

Based on Probit model estimated results in table 3 research variables meaningfully affecting export decision about one percent. In Probit patterns primary estimated coefficients just show descriptive variables effects on independent variable absolute acceptance probability. In such a time final effects of variables are used.

Refer to original model results we could see Z test results too. Value of industrial-geographical concentration variable statistic is 18.5. This is higher than value shown in probability distribution and its effectiveness over dependent variable is confirmed so meaningfully. 1, 5 and 10 percent of this variable affects firms export decisions probability. Estimated industrial-geographical concentration variable coefficient is positive (as we expect) which shows if firms industrial-geographical concentration increase, firms decisions probability for exporting is increase too. The final effect related to this variable shows that increase about one percent in firm industrial-geographical concentration cause firms decision probability for exporting increase about 0.045 percent.

Z test statistical value for labor productivity is 7.90 which determines with comparing Z value with value of Z from probability distribution table and this affecting model. Considering final effect of this variable can say that increase in labor productivity increase exporting decision probability of firms. Actually based on data from tables we can say that one percent increase in labor productivity increase export decision probability about 0.026 percent.

The other variable is studied hear is human resources intensity. Statistical value of this variable which is related to Z is 7 and meaningfully about one percent and reliably about 95 percent affects dependent variable. Its positive sign shows positive effect of human resources intensity on exporting decision variable. The final coefficient of this variable in table shows that by increasing human resources intensity about one percent firms decision to export increase more than 0.11 percent.

Finally we study firm size as a variable. Its statistical Z value is 10.19. Based on its probability, we conclude this variable meaningfully affects firm export decision one percent. Z statistic positive sign and final effects related to this variable is depicting positive effect of firm size on dependent variable and represent that how much firm size is bigger, firm decision to export increased. Actually based on model approximation results,

Table 2: Descriptive statistic of research variables

<table>
<thead>
<tr>
<th>Lowest</th>
<th>Highest</th>
<th>Standard deviation</th>
<th>Mean value</th>
<th>Average</th>
<th>Unit</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>16</td>
<td>0.833888</td>
<td>0.90913</td>
<td>0.998225</td>
<td>Percent</td>
<td>Industrial-Geographical concentration</td>
</tr>
<tr>
<td>0</td>
<td>14000</td>
<td>534</td>
<td>60</td>
<td>20.5</td>
<td>Billion Rial</td>
<td>Labor force efficiency</td>
</tr>
<tr>
<td>0</td>
<td>0.272727</td>
<td>0.00806282</td>
<td>0.1</td>
<td>0.1059934</td>
<td>percent</td>
<td>Human resource intensity</td>
</tr>
<tr>
<td>0</td>
<td>260</td>
<td>50.248</td>
<td>4.35</td>
<td>21.6</td>
<td>Billion Rial</td>
<td>Size(sale)</td>
</tr>
</tbody>
</table>

Table 3: Exporting and none exporting firm’s descriptive statistics Comparison of studying variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non Exporting</th>
<th>Exporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of companies</td>
<td>12058</td>
<td>1174</td>
</tr>
<tr>
<td>Size(sale)</td>
<td>Billion Rial</td>
<td>3573</td>
</tr>
<tr>
<td>Human resources intensity</td>
<td>percent</td>
<td>0.162</td>
</tr>
<tr>
<td>Labor force efficiency</td>
<td>Billion Rial</td>
<td>13.2</td>
</tr>
<tr>
<td>Industrial-Geographical concentration</td>
<td>percent</td>
<td>0.847</td>
</tr>
</tbody>
</table>

Table 4: Probit model results

<table>
<thead>
<tr>
<th>Final effects</th>
<th>Probability</th>
<th>Value(Z)</th>
<th>Standard Deviation</th>
<th>Coefficient(ji)</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.04528</td>
<td>0.0</td>
<td>18.50</td>
<td>0.01691</td>
<td>0.3128</td>
<td>Industrial-Geographical concentration</td>
</tr>
<tr>
<td>0.02686</td>
<td>0.0</td>
<td>7.90</td>
<td>0.02349</td>
<td>0.1855</td>
<td>Labor force efficiency</td>
</tr>
<tr>
<td>0.1154</td>
<td>0.0</td>
<td>7.00</td>
<td>0.1139</td>
<td>0.7976</td>
<td>Human resources intensity</td>
</tr>
<tr>
<td>0.0000509</td>
<td>0.0</td>
<td>10.19</td>
<td>0.0000345</td>
<td>0.0003518</td>
<td>Size(sale)</td>
</tr>
</tbody>
</table>

LRchi² = 688.38, Probchi² = 0.000, R²McFadden=0.087, Log Likelihood = -3619.8021, Pseudo R² = 0.0868

Resource: study find outs
increasing firm size about one percent, increase exporting decision probability about 0.00051 percent which is consistent with other studies results.

Summary of results:
Creating new capacities for improving non petroleum exports was always one of the long term economics solutions for Iran during recent years. Updating needed information considering global evolutions about decision and decision making, technical skills required for export, risk management in non petroleum exports, assists firms in developing export.

This study investigates local position effects on firms export decisions. In this study data from all Iran industrial firms during 2007 are used and these firms export decisions are estimated based on industrial-geographical concentration variable (as a local position index) and firm variable (like firm size, human resources intensity and labor force efficiency). For estimating model, probit multi variable regression model is used. From all involving firms 8.8 percent of them were exporting firms which affected the other firms sand encouraged them to start export.

All model variables have positive effect on firms export decisions which this study results confirms that. These variables meaningfully one percent and reliably 95 percent were affecting dependent variable. Between all under study variables industrial-geographical concentration and human resources intensity were more effective on export decision variable although all model variables had positive effect on export decision variable. These study results is consistent with Lovely and et al [30] in America, Mallemberg and et al in Sweden, Mitlstid in America, Becchetty and Rossi [12] in Italy and Alvarez in Chile findings.

This study could be really important for increasing Iran non petroleum exports by now. This study shows that some provinces of Iran are very active in particular products export and have privilege in exporting this product. Based on this study, establishing non exporting firms in provinces which have potential for special product export, increase these firms exporting inclination. Also increasing number of exporting firms in one province make a competition among firms and cause more firms going to be exporting in that region. So in order to increase export, firms local positions as an important factor must be in center of attention and also those firms in provinces with particular export potential should be noticed too.

REFERENCES