

# Measuring Geographic Diversification: Inferences for Major Sugar Producing Nations



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### Abstract

World sugar trade is predominated by Brazil followed by other 122 nations where sugar is being produced from beet, cane and stevia plant. This present study aims at exploring the concentration (diversification) of sugar exports fifteen major sugar exporting nations from 2001 to 2015. The study revealed that except Canada and Mexico, sugar exports of every sample country has been specialized in a large number of nations in considerable time period. Overall trends show that exports of Germany, China and Spain are highly diversified while India's exports are showing cyclical patterns induced by inconsistent sugarcane production.

**Keywords:** Diversification, Concentration, Exports, Specialization, Cyclicalilty.

### Introduction

World sugar market is much more volatile due to certain factors like monetary policies, agricultural plans, population intensification, weather conditions, and technological advancements. These volatility patterns appear from export trends year on year basis (Figure 1), diversified production systems. World sugar exports are going through various structural changes as related statistics reveal that raw sugar exports predominates the world sugar trade at present time (UNCOMTRADE statistics, 2015). Brazil has a major role to play in international sugar market. But it does not imply that only large market players can sustain for a long run, other cost efficient and large sugar exporting nations also have the opportunity to grab considerable market share as per own competitiveness and cost structure. For instance, new producers are emerging with excellence like Thailand, India, Guatemala, Colombia and China. Concept of export competitiveness is more approachable in case of sugar trade of India as cyclical exports and returning imports over proxy years wrought the basis of sugar trade of India in past two decades. India is the fourth largest economy in the world with huge negative trade balance; therefore, a continuous check on export competitiveness indicator is prerequisite to maintain foreign trade balance. Previous researches conducted in this context show that exporting firms have high foreign exchange earnings and generate bolstering employment growth (Verma, 2002; Meilak, 2008; Ketels, 2010).

### Geographic Concentration (Diversification) - A Literary Review

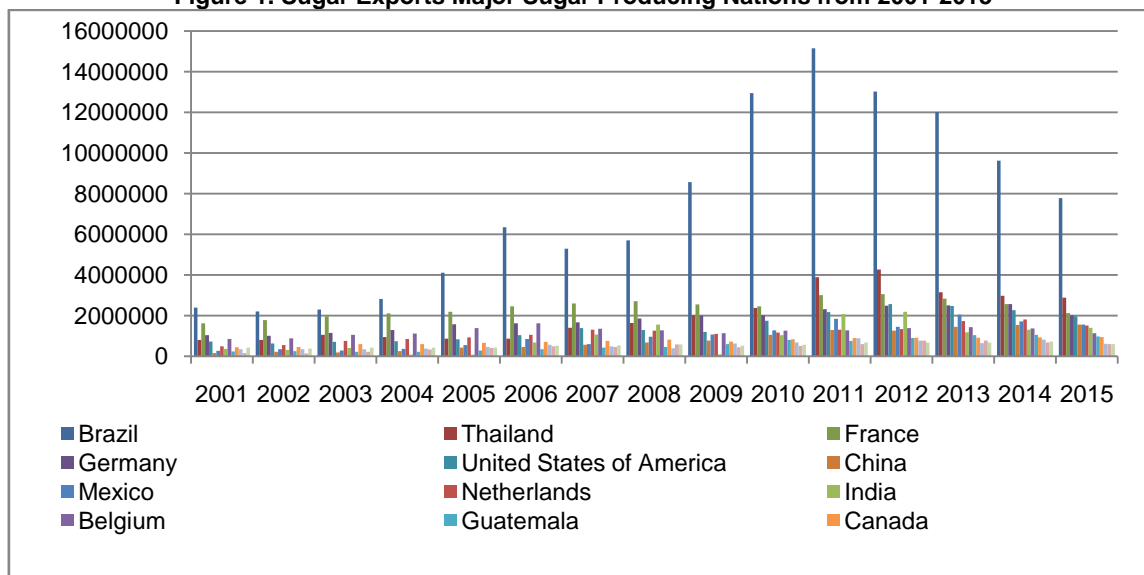
Export competitiveness of a nation is highly dependent on the composition of export basket vis-à-vis geographical dispersion of exports. Both are separate concepts to converse upon. Enriched literature on export composition vis-à-vis diversification patterns of India has significant implications for implementation of future trade policies. There is a wide acceptance of claim that India's manufacturing sector may be a prime constituent of export competitiveness, has very little share of just 14% as compared to 45% of china (Economic Times, 2012). India mainly follows the path of cheap labor enunciated by Hecksher-Ohlin (1933) and has been more specialized in raw material goods which requires more skilled labor but not in high tech and manufacturing goods (Fetscherin & Pillania, 2012). Though, Indian manufactured exports sustained its competitiveness in post reform period at the same time non-manufactured exports have been showing negative trends (Kaur & Nanda, 2011). For the industries like the agricultural or food industry often the degree of self-sufficiency, comparisons of prices or market shares are used for computation of competitive advantage (Schuele, 1999). Second perspective, enlarged geographically diversified products also ensure sustained competitiveness,

for instance, exporters holding low exporting status favored diversification strategy by selling to a lot of buyers belonging to different nations while high intensity exporters believed in concentration strategy which calls for selling to large buyers in limited markets.

Meanwhile, Sugar is considered to be among the most traded commodities with exports accounting for over one quarter of global production (Mahadevan, 2009). It is imperative to enumerate that however, volume wise, Brazil exerts strong influence on world sugar industry. Brazil has unique expansion capacity of sugarcane acreage area unlikely of India; if the sugarcane farmers opt for other crops then total sugarcane acreage area got affected but in Brazil there is a concept of utilizing the unfertile land first without affecting the acreage area of other crops. But Brazil is not the only nation which is highly

suitable for sugar production under current market dynamics rather other developing and LDCs like Thailand, India, Colombia and Guatemala are thriving in world sugar trade with higher comparative advantage with diversified compositions. Natural environment (temperature, rainfall and topography) is favorable in India and moreover, India has long crushing season as sugarcane acreage area is spread all across geographical boundaries (Zimmermann and Zeddies, 2002). Next to India and Brazil, let us concentrate on EU nations; France, Germany, Spain, Poland, Netherlands and Belgium as EU is third largest sugar producer and consumer as well (Elbehri et al., 2008). World sugar consumption is accelerating as per increase in population and income growth but in EU consumption is not increasing rather it is showing a declining trend due to slow population growth and increasing awareness of health issues.

**Figure 1. Sugar Exports Major Sugar Producing Nations from 2001-2015**



**Source:** Compilation on the basis of data from UNCOMTRADE statistics.

Quota system in production is prevalent in EU sugar industry under common agricultural policy programme and when the mills produces surplus then that glut is transferred to other uses; industry purposes and exports. But not any transparent or non-transparent support will be accessible to these sugar producers and exporters.

In U.S. sugar industry sugar is produced from sugarcane and sugar beet. Supporting system is available to sugarcane growers and sugar manufacturers in the form of domestic price support and loan programme which is highly benefitting U.S. sugar industry (Haley, 2013). After these enlarged production hubs, let us move to central and Latin American countries; Guatemala, Colombia and Mexico. Effective capacity utilization and cost competitiveness are salient features of these LDCs which is making them one of low cost producer around the world. Domestic market has not any major role to play in these central and Latin American countries rather exports are the major source of revenue.

**Aim of the Study**

After having a comprehensive overview of respective sugar industries all around the world, it is pre-requisite to explore the specialization of these nations in world market. Hence, the aim of this study is:

1. To examine the geographic diversification of sugar exports of major exporting nations.

**Data and Results**

Export concentration trade index has been employed on data to examine competitiveness of major fifteen sugar exporters during the period 2001-2015. UN COMTRADE statistics has been sourced for extracting data regarding this present study at four digit level. As far as collected data is concerned, not only of India but also the data of other sugar exporting nations have also been taken into consideration. Moreover, aggregated data of three heads ('1701, '1702, '1703) have been compiled.

**Calculation of Index- Hirschman Index (H)**

Other than traditional revealed comparative advantage indices, one more measure of trade competitiveness namely, export concentration has been suggested by many academicians in

international trade literature to predict the scope of diversification in exports. Diversification largely means geographical dispersion here and this index can be formulated as:

$$H_j = \sqrt{\sum (x^k/x_t)^2}$$

Where xi is country j's sugar exports to market k (at the four-digit HS classification) and Xt is country j's total sugar exports. High diversification as closer to zero means high competitiveness and reverse is the case results in high concentration (if H approaches to 1).

### Analysis and findings

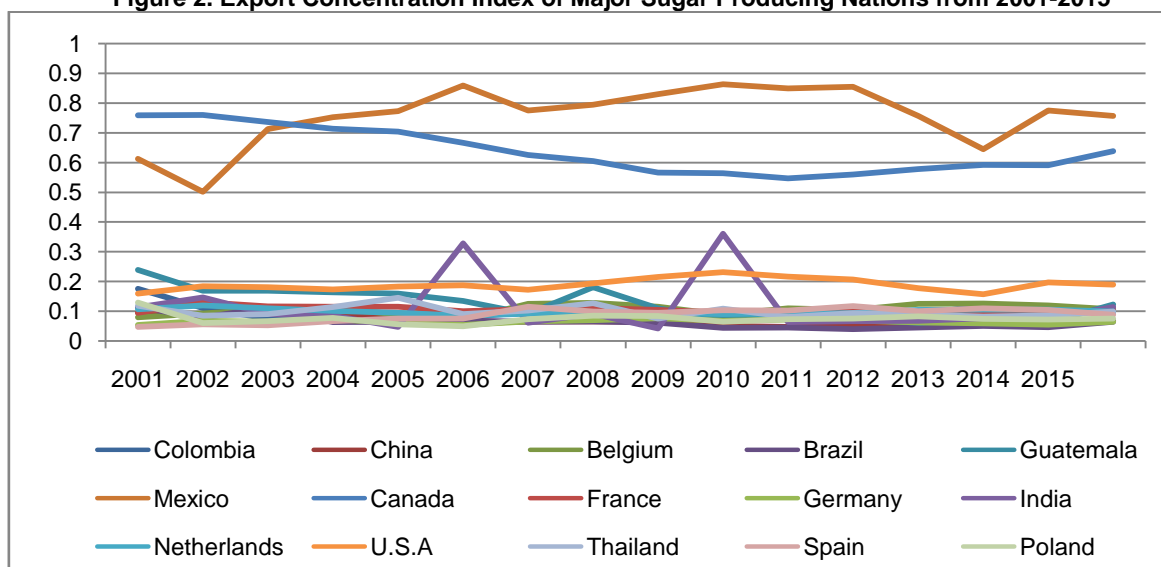
#### Geographic Concentration

Figure 2 and Table 1 posit that only Mexico and Canada have high concentration scores averaging as .75 (Mexico) and .63 (Canada), it implies

that their exports are highly concentrated and they are serving to fewer nations (narrow set of nations) comparatively. On the contrary, all other nations have very low concentration scores signifying more geographically dispersed exports. As discussed earlier, scores approaching to unity depicts the weak geographic dispersion and approaching to zero means the exports are scattered over large number of nations.

Underlying range of export concentration ratios of all nations are as follows; India (.05 to .15), China (.05 to .1), Colombia (.1 to .2), Belgium (.1 to .15), Guatemala (.5 to .25), France (.10 to .12), Germany (.05 to .07), Netherlands (.09 to .11), U.S.A (.15 to .25), Thailand (.05 to .15), Spain (.5 to .10) and Poland (.05 to .15).

**Figure 2. Export Concentration Index of Major Sugar Producing Nations from 2001-2015**



**Source:** Compilation on the basis of data from UNCOMTRADE statistics.

Cyclical Asian nations; China, India and Thailand, emerged players from EU; France, Netherlands, Poland and Central and Latin American

nations; Colombia and Guatemala all are expanding the geographical horizons of their exports (Table 1and Figure1).

**Table 1. Shifts in Export Concentration of Major Sugar Exporting Nations**

	2001	2005	2010	2015	Shifts in Export Concentration Ratio
<b>Belgium</b>	0.08	0.09	0.089	0.12	↓
<b>Brazil</b>	0.114	0.064	0.044	0.046	↑
<b>Canada</b>	0.759	0.704	0.565	0.591	↑
<b>China</b>	0.095	0.081	0.051	0.067	↑
<b>Colombia</b>	0.175	0.078	0.082	0.096	↑
<b>France</b>	0.095	0.116	0.096	0.095	Same as before
<b>Germany</b>	0.054	0.06	0.068	0.055	Same as before
<b>Guatemala</b>	0.239	0.159	0.074	0.061	↑
<b>India</b>	0.113	0.048	0.361	0.074	↑
<b>Mexico</b>	0.613	0.773	0.863	0.774	↓
<b>Netherlands</b>	0.106	0.096	0.09	0.106	Same as before
<b>Poland</b>	0.13	0.055	0.065	0.072	↑
<b>Spain</b>	0.048	0.076	0.104	0.104	↓
<b>Thailand</b>	0.119	0.145	0.108	0.086	↑
<b>U.S.A</b>	0.159	0.183	0.232	0.197	↓

**Note :** ↑- Diversification is increasing & ↓- Concentration is increasing.

**Source:** Author's calculations based on U.N. COMTRADE data base.

In addition to this, exports of Belgium, Mexico and Spain are supposed to behold presence just in comparatively narrower continuum of countries.

#### **Conclusion**

This factual outline enabled us to observe the trends in diversified exports of India as well as major world sugar exporting nations. Analyzing competitive performance and suggesting trade policy changes are the motives behind extracting geographic concentration ratios of sugar exports. India's diversification is cyclical; sustaining between highly concentrated to diversified and exports still requires diversification of Indian export basket. Home market of nations; Thailand, Mexico and Colombia, Guatemala is small and only leftovers are sufficient to meet domestic demand and the demand patterns of importing nations and international sugar prices have a major role to play.

Regarding this, notion highlighted by Agricultural outlook (2011) can be put forth; Whenever the international competitiveness of sugar production has been measured then output side which is significantly affected due to the national sugar policy of every country and input side is mainly characterized by the technical efficiency and national factor prices. Stability in exports in a large number of markets and in a diversified range of products ensures larger foreign exchange reserves and a successful strategy to cop up with the problem of cyclicality because the success of trading nations in international market largely depends upon the implementation of internationally competitive sugar policies. Moreover, Indian sugar industry has been titled as "handicapped" in world sugar trade due to predominance of stringent regulations in past decades (Zimmermann and Zeddies, 2002). Indian sugar industry is still struggling with the problem of cyclicality in sugarcane production and low labour productivity. Resultantly, finished product having comparatively higher cost as of competitors' product is impossible to export without governmental extended assistances.

There is a two way relation between agricultural trade policies and production and, exports of essential commodities. Hereby, sugar is an agricultural cum essential commodity as per Indian classification of goods whose exports and imports trade flows have a direct impact on agricultural trade policies of particular crop; sugarcane. Similarly, agricultural trade policies protect / influence the whole value chain upto exports of this manufacturing industry.

Reason behind this two way relationship is high intensity of competition in world sugar market and these are the agricultural policies that determine the decision; whether to export or just be self sufficient and assist their consumer base or exports. If the nations choose to export then it is also a major concern that the governments can sustain capacity to finance<sup>1</sup> their export or not. But supporting the export base is ephemeral and not advisable. In this context, Plumpe and Graff (2001) stated that governmental assistances in form of subsidies and protectionist measures can not ensure the growth of the industry

and economy in a long run. Whilst it is all about the technological advancements which induces positive changes in market shares of economies. International competitiveness in manufacturing exports can be attained and sustained fundamentally on the basis of technological advantage (continuous emphasis on product innovation through research and development activities).

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#### **Footnotes**

1. In India, EXIM bank finances every type of exports in two phases; pre-shipment and post shipment.