Export Performance Analysis of Gems & Jewellery Industry - A Comparative Study of India and USA

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This study analyses the export performance of the Gems & Jewellery Industry for India and its immediate competitors USA. The study identifies the pattern of Revealed Comparative Advantage using the Balassa (1965), Vollrath (1991), and Laursen (1998) index at 2 & 4-digit level of HS Classification of the Gems & Jewellery Industry for India and USA for the period of 2001-2013. The three Revealed Comparative Advantage indices that are demonstrated in this study have been calculated with export and import data for the countries, and the data has been taken from International Trade Centre (ITC). The results revealed that India has lower level of Export Competitiveness when compared with the United States of America. India has higher competitive advantage in commodities such as Diamonds, not mounted or set (7102), Articles of goldsmith's/silversmith's wares&pts (7114), Articles of jewellery parts thereof (7113), and Precious & semi-precious stone, not strug (7103). At two-digit level, India is the precedent of USA.

Keywords: Export Competitiveness, RCA Index, Gems & Jewellery Industry

Introduction

Trade has become a common phenomena and an important aspect for every economy. In this decade, for a country to survive with its domestic production wholly has become next to impossible. The increasing support from various international organizations has made the flow of goods and services produced in the home country to the foreign markets quick and easy with proper involvement of the trade officials, custom authorities of both the exporting and importing countries. The Gems and Jewellery sector has been one of oldest sectors traded by most of the important economies of the world. This sector has worldwide importance due to the artistic element imbibed in it. The Indian economy has bounced back from recession and over the last four years (2010-13) has achieved a sustainable and annual GDP growth rate of 5% (World Bank, 2010-2014). The growth rate has been highly influenced by the Export sector itself. The total exports of India for the year 1988 were US $13,872mn which has gained considerable momentum over the last two decades and has now reached US $336,611mn, therefore, trade accounts for 53.23% of India's GDP (WITS, 2013).

The Gems & Jewellery sector is mainly dominated by some of the powerful nations like the USA, UK, India, China, Thailand, Belgium etc. The top export partners of Indian Gems & Jewellery are UAE, China, USA, Belgium, Israel, Thailand, Singapore, UK and Japan. The importing markets of Indian Gems & Jewellery sector are Switzerland, Belgium, UAE, Hong Kong, South Africa, UK and USA (WITS, 2013). This industry has recorded an exceptional growth over the last forty years with its exports increasing from US $28mn in 1966-67, when the Gems and Jewellery Export Promotion Council was established, to US $35bn in 2013 (GJEPC, 2013). By 2018, the sector is expected to grow by US $80.59-85.43bn (IBEF, 2015).

Among the top five products that are exported by India, Diamonds, not mounted or set (7102) and Articles of jewellery parts thereof (7113) are two such products that are exported by India to a large extent, that is, US $27.08bn and US $9.57bn respectively (WITS, 2013).

India's immediate and consistent competitor in this sector over the study period 2001-2013 has been the USA. The top export partners of USA's Gems & Jewellery are Hong Kong, Switzerland, Canada, India and Israel, while the importing markets of USA for this sector are China, India, Mexico, Israel and Canada (WITS, 2013). The commodity Gold (incl. gold plated with platinum), non-monetary, in powder form (710811) is the third-most export product for USA which accounts for US $31.88bn of country's total export (WITS, 2013).

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Literature Review

The Gems and jewellery is one of the major industry of many nations which carries the true reflection of various cultural and religions. In India, this is one of the traditional industries which provide the livelihood to many the craftsmen and most of the Indian rural household. Satya Sundaram (2001) analyzed the possibilities of Indian Gems & Jewellery Industry. According to his research, In recent years, performance of Indian Gems & Jewellery industry has been remarkably improved in international market but to enhance it market hold and for the long run survival in the international trade, India need to be more focused towards the quality and the taste and of European market.

A major part of this study is to find out the competitive advantage of the Gems & Jewellery in India and its immediate competitor the USA. For this, (Exim Bank, 2010) found the strategies and other challenges in this sector. Due to recession, the industry has faced a loss in the world market. It also analyses the commodities such as Pearls, nat or cult, etc (7101), Imitation Jewellery (7117) which could be focussed upon in future in order to increase the export competitiveness of India in Gems & Jewellery. It also analyses the other potential markets which are untapped and that could be utilised in order for India & USA to have a greater foothold in other nations as well. Vipul Shah (2012) has over the years held many successful meetings with India's immediate competitor USA in order to bring forward all the major players of these countries with their Indian counterparts in order to facilitate better business opportunities for the growth of trade. It has been stated in the report that the Indian Gems and Jewellery industry has been showcasing a growth of 10-15% per year and an increase in the volume of exports from US$25.4 billion in the year 2009 to US$46.36 billion in 2011, thereby indicating a net increase of an enormous 82.5%. A newer dimension was provided when the exports to Russia for 2011 increased from US$ 3.13 million in 2009 to US$ 8.2million in 2011 indicating net increase of 162%.This increase is the result of market revival post worldwide recession (2008-2009) and also the various measures undertaken by the Indian Government in order to gain foreign trade. (IBEF, 2013) assessed that India has performed extremely well in regards to polishing, which in turn made world class cut diamonds. The report also forecasted that a joint trade between India & USA could be beneficial which could account over 30% of global diamond market in 2015. After studying about the industry, the export promotional activities and other trade policies, the Revealed Comparative Advantage (RCA) introduced by (Balassa B. , 1965) has been used to analyze the competitive advantage of the jewellery industry for India and its immediate competitors. The RCA is an economist's tool that helps in identifying the particular industries or sectors that possess a competitive advantage in a country's economy. If the result of RCA index was greater than unity, the sector or a commodity of that sector said to have a competitive advantage. In order to get a more symmetric result which could be compared on both sides of unity, the Revealed Symmetric Comparative Advantage (RSCA) by (Laursen K. , 1998) is also studied. Furthermore, since RCA showed trade patterns by considering only the exports of a country, the Relative Trade Advantage (RTA) by (Vollrath T. L., 1991) is also studied which gives the trade patterns by taking into consideration both imports and exports of a country.

Objectives of the study

a) To measure the Export Competitiveness for India and USA

b) To find out which country has better potential for exports of Gems & Jewellery.

c) To find out the influential product category in Gems & Jewellery industry for both the countries.

Research Questions

Q1) Whether the Indian Gems & Jewellery industry enjoy export competitiveness over USA?

Q2) Where India's competitiveness and comparative advantage lie in Gems & Jewellery industry within the framework of international trade in reference to USA?

Q3) Which are the competitive products in terms of their comparative advantage and export competitiveness for both the countries under consideration?

Research Methadology

There are various measures for determining comparative advantage of a nation. Among these various measures, one of the most commonly used

methods is Balassa's Revealed Comparative Advantage Index. This index was given by Bela Balassa and is popularly known as Balassa's index. Balassa (1965, 1979, 1986, and 1989) suggested that, instead, a country's comparative advantage is "revealed" by observing its trade patterns. Balassa's index is defined as the relative proportion of the export share of a given product or sector in a country as compared to the export share of that commodity or industry in the global market. This index can be expressed as depicted by equation (1).

$$RCA_{nm} = RXA = (X_{nm} / X_{wm}) / (X_n / X_w) \dots\dots\dots (1)$$

Where,

X_{nm} = n^{th} country's export of product m

X_{wm} = World's total export of product m

X_n = Total export of country n

X_w = Total export of world

RCA_{nm} = Revealed comparative advantage of product m in country n.

As per the RCA index a country 'n' is said to have a comparative advantage in a commodity 'm' when RCA > 1, and is said to have a comparative disadvantage when RCA < 1. When RCA= 1 the proportionate share of the given commodity is the considered to be identical as the world average.

However, the RCA index is not without shortcomings. The pure RCA is said to be asymmetric and not comparable on both side of unity. To deal with this shortcoming, Dalum et al. (1998) improved upon this index by proposing an adjusted index. Lauresen (1998) acknowledged this index as Revealed Systematic Comparative Advantage (RSCA). This index can be expressed as depicted by equation (2).

$$RSCA = (RCA-1) / (RCA+1) \dots\dots\dots\dots (2)$$

RSCA removes the skewness of RCA and makes it symmetric such that the values obtained ranges between -1 and +1. The positive value of RSCA depicts that nth country has comparative advantage in export of product m in reference with market of particular set of countries and the negative value of RSCA depicts vice-versa.

However, RCA/RSCA index take into consideration only the exports of a country. To improve upon this Thomas Lachlan Vollrath suggested three alternative indices in 1991 that take in the effect of both exports as well as imports of the country to measure the comparative advantage of a

nation. The Vollrath (1991) index which holds for double counting in world trade has been used in this analysis. In this study, the first of these measures is used which is the Relative Trade Advantage (RTA), and it holds true for imports as well as exports. Relative Trade Advantage index is defined as difference between relative export advantage (RXA) which is same as Balassa's index (RCA) and its counterpart, relative import advantage (RMA). This index can be mathematically depicted as:

$$RTA_{nm} = RXA_{nm} - RMA_{nm} = (X_{nm} / X_{wm}) / (X_n / X_w) - (Y_{nm} / Y_{wm}) / (Y_n / Y_w) \dots\dots\dots (3)$$

Where, all the variables are same as given by equation (1) except Y which represents imports.

The positive values of Vollrath indicate a competitive/comparative advantage of a product for the particular country under consideration and the negative values depict a competitive / comparative disadvantage.

Since the study deals in the number of alternative RCA indices, it can produce varying results and varying conclusions. Thereby, some statistical tests will be performed to check the consistency of the result obtained from alternative RCA indices. The cardinal interpretation and ordinal interpretation given by (Balance, Forstner, & Murray, 1987) is performed. The former finds out the extent to which a country possesses comparative advantage in a product, while the latter finds out whether the RCA index provides a ranking of products by degree of comparative advantage. The consistencies of these interpretations are measured by Karl Pearson's correlation coefficient for consistency of cardinality and Spearman's rank correlation coefficient for ordinality suggested by (Balance, Forstner, & Murray, 1987). The coefficients values closer to one for each test indicate that a pair of indices is consistent as a cardinal and ordinal measure of comparative advantage respectively.

As the focus of the study is to assess the Export Competitiveness of Gems & Jewellery Industry for India and its immediate competitors in the world market, the indices are calculated separately for all Gems & Jewellery commodities and for entire Gems & Jewellery industry as a whole. All the values for export and import of commodities have been taken from the International Trade Centre (ITC) online database for the study period 2001-2013. The RCA indices are calculated for 2-digit level of HS Classification, i.e., Gems & Jewellery (71) and also

for 4-digit level of HS Classification to get a detailed and more comparative study of the various commodities, 7101-7118. It is also necessary to understand that RCA indices do not work in isolation. They may sometimes be influenced by government interventions. Vollrath (1989) suggested that government interventions and competitiveness are inversely related, which means that a commodity which reveals comparative advantage can be more competitive if markets are more open.

Results And Discussion

The study analyses Export Competitiveness employing Balassa's (1965), Laursen's (1998) & Vollrath (1991) index at 2 & 4-digit level of HS Classification of the Gems & Jewellery Industry for India and USA for the period of 2001-2013. The analysis gives a clear view about the commodities in which the countries are having comparative advantage in the Gems & Jewellery export for the study period.

The Balassa Index used in this study gives the direction of trade flows and reveals a country's specialization patterns and therefore the revealed comparative advantage, but, not the source of this advantage. The BI is calculated as the share of a given industry in a country's exports to the share of the same industry in total world exports. The Balassa Index does not differentiate among the destinations of exports, whether they are regional or international. Vollrath (1989) developed the "Revealed Competitiveness" (RC) index which incorporates both imports and exports. Laursen (1998) calculated the Symmetric RCA (RSCA) since the RCA was unable to produce an output that could be compared on both sides of 1. Thus, RSCA takes values from - 1 to + 1. The focus of this study is on the Export Competitiveness of the Gems & Jewellery Industry for India and its immediate competitors USA by considering Balassa's, Laursen's and Vollrath's indices for a time period of 2001-2013.

Two Digit Level

Table 1: Revealed Comparative Advantage for Gems & Jewellery (71) in India & USA					
	India			USA		
Years / Indices	RCA	RTA	RSCA	RCA	RTA	RSCA
2001	8.57	-1.31	0.79	17.86	-8.83	0.89
2002	9.00	0.39	0.80	13.68	-8.92	0.86
2003	9.16	0.31	0.80	13.08	-6.76	0.86
2004	8.47	-0.74	0.79	12.10	-5.21	0.85
2005	8.15	-0.22	0.78	11.10	-2.25	0.83
2006	6.41	0.37	0.73	12.75	0.37	0.85
2007	6.15	0.06	0.72	13001	2.49	0.86
2008	4.79	-0.20	0.65	12.07	5.16	0.85
2009	7.01	0.54	0.75	8.26	2.61	0.78
2010	5.07	-2.23	0.67	8.07	2.52	0.78
2011	4.73	-1.80	0.65	6.80	2.18	0.74
2012	4.11	-1.20	0.61	6.83	2.74	0.74
2013	3.84	-1.07	0.59	6.27	1.57	0.72
Mean	6.57	-0.55	0.72	10.91	-0.95	0.82
CV	0.30	-1.67	0.11	0.31	-5.13	0.07
Source: Author's calculations based on HS data from the International Trade Cente's (ITC) database.						

Table 1 exhibits two digit level of HS classification of Gems & Jewellery industry. From all the three indices it can be inferred that USA has a higher Comparative Advantage for this industry than India. To consider export competitiveness, RSCA index gives a better output as it deals with the shortcomings and asymmetry of RCA values. According to RSCA values, USA has a mean of 0.82 and India has a mean of 0.72 respectively, with a difference of 10% for coefficient of variation between both the countries, USA (7%) and India (11%), i.e., USA not just holds a higher mean-RSCA value, it's result is more reliable than India due to a lower variation. It can also be observed that in order for USA & India to have a Relative Trade Advantage, they need to cut down on their imports and should increase their exports.

Four Digit Level
RCA Analysis

- ### India

Code	Product label	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean	CV
	Table 2 - Revealed Comparative Advantage (RCA-India)															
'7101	Pearls, nat or cult, etc	0.18	0.29	0.37	1.38	0.15	0.13	0.20	0.13	0.24	0.04	0.07	0.23	11.08	1.11	2.71
'7102	Diamonds, not mounted or set	17.27	16.27	17.67	14.55	14.08	11.98	12.71	11.97	13.91	12.41	12.55	10.47	10.94	13.60	0.17
'7103	Precious & semi-precious stone, not strug,	16.09	13.53	13.69	11.85	10.87	8.66	7.84	6.38	5.82	3.79	3.76	4.12	5.30	8.60	0.49
'7104	Syn/reconstr prec/semi-prec stones, not strg/mounted/set	1.15	0.70	0.78	0.92	0.62	0.42	0.35	2.20	1.91	1.00	1.04	1.53	1.44	1.08	0.52
'7105	Dust&powder of precious or semi-precious stones	6.79	8.01	2.45	6.03	6.68	2.36	3.88	1.03	27.28	6.50	9.12	2.52	6.80	6.88	0.96
'7106	Silver,unwrght or in semi-manuf. form	0.00	0.01	0.02	0.11	0.05	0.18	0.04	0.09	0.46	0.07	0.03	0.08	0.08	0.09	1.29
'7107	Base metals clad with silver, nfw than semi-manufactured	0.01	0.11	0.01	0.02	0.07	0.01	0.03	0.06	0.00	0.03	1.73	0.19	0.03	0.18	2.64
'7108	Gold unwrought or in semi-manuf forms	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.12	0.05	0.12	0.01	0.50	0.06	2.24
'7109	Base metals or silver, clad with gold, nfw than semi-manufactured	0.01	0.37	0.67	0.01	0.05	0.12	0.00	0.05	0.08	0.01	0.03	0.02	0.06	0.11	1.70
'7110	Platinum, unwrought or in semimanufactured forms	0.12	0.06	0.05	0.05	0.07	0.02	0.07	0.03	4.23	0.01	0.01	0.01	0.02	0.36	3.19
'7111	Base metals, or silver or gold, clad w plat, nfw than semi-manufactured	1.09	0.04	0.21	0.02	0.99	2.68	0.09	0.08	0.00	0.87	0.00	0.00	0.00	0.47	1.67
'7112	Waste & scrap of precious metal	0.02	0.01	0.07	0.09	0.49	1.01	1.16	0.64	0.47	0.93	0.94	1.24	1.01	0.62	0.74
'7113	Articles of jewellery&parts thereof	8.02	8.08	9.08	11.72	10.10	11.73	10.43	7.70	14.70	9.06	10.46	10.69	5.64	9.80	0.23
'7114	Articles of goldsmith's/silversmith's wares&pts	0.94	2.32	2.01	6.20	7.04	19.37	3.66	1.48	45.21	14.43	10.25	21.73	1.92	10.51	1.19
'7115	Articles of precious metal or metal clad with precious metal, nes	0.43	0.05	0.06	0.04	0.02	0.10	0.19	0.13	0.02	0.08	0.07	0.01	0.02	0.09	1.23
'7116	Articles of natural or cultured pearls, prec/semi prec stones	0.06	1.85	2.16	1.38	0.39	0.04	0.01	0.05	0.20	0.28	0.15	0.17	0.20	0.53	1.40
'7117	Imitation jewellery	2.23	2.20	2.19	19.16	11.90	2.61	2.21	2.54	2.50	1.96	3.40	3.68	2.79	4.57	1.12
'7118	Coin	0.03	0.00	0.01	0.02	0.01	2.17	0.28	0.43	7.16	27.85	0.29	0.43	0.01	2.98	2.60

Source: Author's calculations based on HS data from the International Trade Cente's (ITC) database.

Table 2 shows that, India holds a comparative advantage on nine of the products of Gems & Jewellery industry at four digit level of HS classification i.e., 7101-7118. Diamonds, not mounted or set (7102), Articles of goldsmith's/silversmith's wares&pts (7114), Articles of jewellery parts thereof (7113), and Precious & semi-precious stone, not strug (7103) hold the highest comparative advantage among all the Eighteen gems and jewellery products. Out of the above four products, HS-Code 7102 shows least variation of 17%, thus giving a major advantage to the Diamond industry. This result tells that India has got an Export Competitiveness in diamonds which gives India an edge over others. Pearls, nat or cult, etc (7101), Syn/reconstr prec/semi-prec stones, not strg/mounted/set (7104), Dust&powder of precious or semi-precious stones (7105), Imitation jewellery (7117), Coin (7118) are the other commodities that have their RCA index above 1 and thus shows export competitive advantage. The RCA values thus infer that India has export competitive advantage in nine commodities and disadvantage in the other nine commodities which are Silver,unwrght or in semi-manuf. Form (7106), Base metals clad with silver, nfw than semi-manufactured (7107), Gold unwrought or in semi-manuf forms (7108), Base metals or silver, clad with gold, nfw than semi-manufactured (7109), Platinum, unwrought or in semimanufactured forms (7110), Base metals, silver or gold, clad w plat, nfw than semi-manufactured (7111), Waste & scrap of precious metal (7112), Articles of precious metal or metal clad with precious metal, nes (7115), Articles of natural or cultured pearls, prec/semi prec stones (7116).

- ### USA

Code	Product label	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean	CV
	Table 3 - Revealed Comparative Advantage (RCA-USA)															
'7101	Pearls, nat or cult, etc	0.36	0.46	0.37	0.37	0.55	0.33	0.42	0.35	0.33	0.37	0.42	0.53	0.25	0.39	0.21
'7102	Diamonds, not mounted or set	0.78	0.76	0.88	1.07	1.12	1.30	1.42	1.66	1.39	1.36	1.45	1.49	1.57	1.25	0.24
'7103	Precious & semi-precious stone, not strug,	0.77	0.90	1.11	1.22	1.17	1.16	1.44	1.37	1.73	1.39	1.90	2.19	1.83	1.40	0.30
'7104	Syn/reconstr prec/semi-prec stones, not strg/mounted/set	0.84	0.88	1.08	1.29	1.29	1.48	1.22	1.35	0.98	1.48	1.57	1.40	1.19	1.23	0.19
'7105	Dust&powder of precious or semi-precious stones	2.08	2.29	2.11	2.16	2.06	1.92	2.20	2.42	1.25	1.70	1.77	2.51	2.30	2.06	0.16
'7106	Silver,unwrght or in semi-manuf. form	0.51	0.56	0.43	0.58	0.53	1.11	0.73	0.75	0.82	1.05	0.95	0.90	0.71	0.74	0.29
'7107	Base metals clad with silver, nfw than semi-manufactured	4.51	4.54	1.25	1.80	1.22	1.76	1.76	2.57	3.14	2.97	3.45	3.94	4.82	2.90	0.44
'7108	Gold unwrought or in semi-manuf forms	1.86	1.23	1.42	1.10	1.57	1.58	2.08	2.02	1.25	1.23	1.37	1.41	1.40	1.50	0.20
'7109	Base metals or silver, clad with gold, nfw than semi-manufactured	0.90	1.11	1.12	1.19	1.70	3.26	4.85	4.38	4.00	3.23	2.45	3.59	4.15	2.76	0.51
'7110	Platinum, unwrought or in semimanufactured forms	1.19	1.91	1.20	1.18	1.22	1.80	1.43	1.17	0.86	1.20	1.09	0.84	0.88	1.23	0.27
'7111	Base metals, or silver or gold, clad w plat, nfw than semi-manufactured	1.96	1.48	1.14	2.58	1.39	3.66	1.55	4.94	4.79	1.12	0.01	0.01	0.12	1.90	0.87
'7112	Waste & scrap of precious metal	3.08	3.44	3.20	3.68	3.25	3.90	4.36	5.15	5.16	5.12	5.26	2.64	2.77	3.92	0.25
'7113	Articles of jewellery&parts thereof	0.88	0.91	0.95	1.07	1.17	1.33	1.16	1.29	1.21	1.16	1.05	0.90	1.11	1.09	0.14
'7114	Articles of goldsmith's/silversmith's wares&pts	0.55	0.63	0.40	0.42	0.50	0.98	0.43	0.19	0.09	0.07	0.03	0.12	0.11	0.30	0.68
'7115	Articles of precious metal or metal clad with precious metal, nes	1.30	1.28	1.29	1.01	0.91	0.54	0.51	1.15	0.86	1.01	0.35	0.15	0.19	0.81	0.51
'7116	Articles of natural or cultured pearls, prec/semi prec stones	3.79	4.57	5.04	6.74	7.43	7.40	9.06	6.83	6.22	6.18	3.56	3.50	2.48	5.60	0.35
'7117	Imitation jewellery	0.56	0.54	0.53	0.46	0.46	0.57	0.52	0.58	0.48	0.52	0.59	0.58	0.56	0.53	0.09
'7118	Coin	0.39	0.36	0.31	0.58	0.56	0.80	1.24	1.21	0.69	1.41	3.95	2.74	1.67	1.22	0.87

Source: Author's calculations based on HS data from the International Trade Cente's (ITC) database.

From Table 3 we can see that, United States of America holds a comparative advantage on thirteen products out of eighteen products of Gems & Jewellery industry at four digit level of HS classification i.e., 7101-7118. Diamonds, not mounted or set (7102), Precious & semi-precious stone, not strug (7103), Syn/reconstr prec/semi-prec stones, not strg/mounted/set (7104), Dust&powder of precious or semi-precious stones (7105), Base metals clad with silver, nfw than semi-manufactured (7107), Gold unwrought or in semi-manuf forms (7108), Base metals or silver, clad with gold, nfw than semi-manufactured (7109), Platinum, unwrought or in semi manufactured forms (7110), Base metals, silver or gold, clad w plat, nfw than semi-manufactured (7111), Waste & scrap of precious metal (7112), Articles of jewellery parts thereof (7113), Articles of natural or cultured pearls, prec/semi prec stones (7116) and Coin (7118) hold comparative advantage as their mean RCA values are >1 among all the eighteen Gems and Jewellery commodities. Of the thirteen products mentioned above HS Code-7112 (Waste & scrap of precious metal) and 7116 (Articles of natural or cultured pearls, prec/semi prec stones) has the maximum mean value of 3.92 and 5.60 respectively, but the variation is lesser for HS Code 7112 (Waste & scrap of precious metal) 25% than 7116 (Articles of natural or cultured pearls, prec/semi prec stones) 35% thereby, making it more reliable for export. Pearls, nat or cult, etc (7101), Silver, unwrght or in semi-manuf. form (7106), Articles of goldsmith's/silversmith's wares&pts (7114), Articles of precious metal or metal clad with precious metal, nes (7115), Imitation Jewellery (7117) are the commodities which show export comparative disadvantage for United States of America.

RSCA Analysis
- ### India

Code	Product label	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean	CV
'7101	Pearls, nat or cult, etc	-0.70	-0.55	-0.46	0.16	-0.74	-0.77	-0.67	-0.77	-0.62	-0.93	-0.87	-0.62	0.83	-0.52	-0.94
'7102	Diamonds, not mounted or set	0.89	0.88	0.89	0.87	0.87	0.85	0.85	0.85	0.87	0.85	0.85	0.83	0.83	0.86	0.02
'7103	Precious & semi-precious stone, not strug,	0.88	0.86	0.86	0.84	0.83	0.79	0.77	0.73	0.71	0.58	0.58	0.61	0.68	0.75	0.15
'7104	Syn/reconstr prec/semi-prec stones, not strg/mounted/set	0.07	-0.17	-0.13	-0.04	-0.24	-0.41	-0.48	0.37	0.31	0.00	0.02	0.21	0.18	-0.02	-11.08
'7105	Dust&powder of precious or semi-precious stones	0.74	0.78	0.42	0.72	0.74	0.41	0.59	0.01	0.93	0.73	0.80	0.43	0.74	0.62	0.39
'7106	Silver,unwrght or in semi-manuf. form	-0.99	-0.99	-0.96	-0.80	-0.91	-0.70	-0.93	-0.83	-0.37	-0.87	-0.94	-0.85	-0.86	-0.85	-0.19
'7107	Base metals clad with silver, nfw than semi-manufactured	-0.97	-0.80	-0.98	-0.96	-0.87	-0.99	-0.94	-0.89	-1.00	-0.94	0.27	-0.68	-0.94	-0.82	-0.41
'7108	Gold unwrought or in semi-manuf forms	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-0.99	-1.00	-0.79	-0.90	-0.78	-0.98	-0.33	-0.91	-0.21
'7109	Base metals or silver, clad with gold, nfw than semi-manufactured	-0.98	-0.46	-0.20	-0.99	-0.90	-0.79	-1.00	-0.90	-0.84	-0.99	-0.94	-0.97	-0.88	-0.83	-0.28
'7110	Platinum, unwrought or in semimanufactured forms	-0.78	-0.89	-0.91	-0.90	-0.87	-0.96	-0.88	-0.95	0.62	-0.97	-0.98	-0.98	-0.97	-0.80	-0.54
'7111	Base metals, or silver or gold, clad w plat, nfw than semi-manufactured	0.04	-0.92	-0.65	-0.96	-0.01	0.46	-0.84	-0.85	-1.00	-0.07	-1.00	-1.00	-1.00	-0.60	-0.85
'7112	Waste & scrap of precious metal	-0.96	-0.98	-0.86	-0.83	-0.34	0.01	0.07	-0.22	-0.36	-0.04	-0.03	0.11	0.00	-0.34	-1.23
'7113	Articles of jewellery&parts thereof	0.78	0.78	0.80	0.84	0.82	0.84	0.83	0.77	0.87	0.80	0.83	0.83	0.70	0.81	0.05
'7114	Articles of goldsmith's/silversmith's wares&pts	-0.03	0.40	0.34	0.72	0.75	0.90	0.57	0.20	0.96	0.87	0.82	0.91	0.32	0.59	0.54
'7115	Articles of precious metal or metal clad with precious metal, nes	-0.40	-0.91	-0.89	-0.92	-0.96	-0.83	-0.68	-0.76	-0.96	-0.86	-0.87	-0.98	-0.97	-0.85	-0.19
'7116	Articles of natural or cultured pearls, prec/semi prec stones	-0.89	0.30	0.37	0.16	-0.44	-0.92	-0.97	-0.91	-0.67	-0.57	-0.74	-0.71	-0.67	-0.51	-0.93
'7117	Imitation jewellery	0.38	0.37	0.37	0.90	0.84	0.45	0.38	0.44	0.43	0.32	0.54	0.57	0.47	0.50	0.36
'7118	Coin	-0.94	-0.99	-0.99	-0.96	-0.97	0.37	-0.57	-0.39	0.75	0.93	-0.55	-0.40	-0.99	-0.44	-1.57

Table 4 - Revealed Symmetric Comparative Advantage (RSCA-India)

Source: Author's calculations based on HS data from the International Trade Cente's (ITC) database.

Table 4 shows indices for Laursen's (1998) RSCA. India holds Revealed Symmetric Comparative Advantage in six commodities and the highest in Diamonds, not mounted or set (7102), Precious & semi-precious stone, not strug (7103), Articles of goldsmith's/silversmith's wares&pts (7114), Articles of jewellery parts thereof (7113). Diamond has the least variation of 2% which thus makes it have highest Export Competitiveness for India. RSCA take values from -1 (when RXA tends to infinite, which indicates absolute export advantage) to + 1 (when RXA is zero and exports are minimal). The Table 4 values confirms the values of RCA of Table 2, by showing advantage in exporting commodities Diamonds, not mounted or set (7102), Precious & semi-precious stone, not strug, (7103), Dust&powder of precious or semi-precious stones (7105), Articles of jewellery parts thereof (7113), Articles of goldsmith's/silversmith's wares&pts (7114), Imitation jewellery (7117). These commodities have a clear export advantage as their mean RSCA values are nearer to +1. The commodities Pearls, nat or cult, etc (7101), Syn/reconstr prec/semi-prec stones, not strg/mounted/set (7104), Coin (7118) on the other hand though showed Revealed Comparative Advantage in Table 2, the RSCA index deals with the shortcomings and asymmetry of RCA values and gives a more appropriate result for export competitiveness by giving a measure that ranges between -1 and +1. Commodities Silver,unwrght or in semi-manuf. Form (7106), Gold unwrought or in semi-manuf forms (7108), Base metals or silver, clad with gold, nfw than semi-manufactured (7109),Articles of precious metal or metal clad with precious metal, nes (7115) have shown Export Disadvantage continuously for the study period and thus do not have significant export advantage for India.

- **USA**

Code	Product label	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean	CV
'7101	Pearls, nat or cult, etc	-0.47	-0.37	-0.46	-0.46	-0.29	-0.50	-0.41	-0.49	-0.50	-0.46	-0.41	-0.31	-0.60	-0.44	-0.19
'7102	Diamonds, not mounted or set	-0.12	-0.14	-0.06	0.03	0.06	0.13	0.17	0.25	0.16	0.15	0.18	0.20	0.22	0.10	1.38
'7103	Precious & semi-precious stone, not strug,	-0.13	-0.05	0.05	0.10	0.08	0.07	0.18	0.16	0.27	0.16	0.31	0.37	0.29	0.14	1.02
'7104	Syn/reconstr prec/semi-prec stones, not strg/mounted/set	-0.09	-0.07	0.04	0.13	0.13	0.19	0.10	0.15	-0.01	0.19	0.22	0.17	0.09	0.10	1.04
'7105	Dust&powder of precious or semi-precious stones	0.35	0.39	0.36	0.37	0.35	0.31	0.38	0.41	0.11	0.26	0.28	0.43	0.39	0.34	0.25
'7106	Silver,unwrght or in semi-manuf. form	-0.32	-0.28	-0.40	-0.26	-0.31	0.05	-0.16	-0.14	-0.10	0.03	-0.02	-0.05	-0.17	-0.16	-0.87
'7107	Base metals clad with silver, nfw than semi-manufactured	0.64	0.64	0.11	0.29	0.10	0.28	0.27	0.44	0.52	0.50	0.55	0.60	0.66	0.463	0.46
'7108	Gold unwrought or in semi-manuf forms	0.30	0.10	0.17	0.05	0.22	0.22	0.35	0.34	0.11	0.10	0.16	0.18	0.17	0.19	0.49
'7109	Base metals or silver, clad with gold, nfw than semi-manufactured	-0.05	0.05	0.06	0.09	0.26	0.53	0.66	0.63	0.60	0.53	0.42	0.56	0.61	0.38	0.69
'7110	Platinum, unwrought or in semimanufactured forms	0.09	0.31	0.09	0.08	0.10	0.29	0.18	0.08	-0.08	0.09	0.04	-0.09	-0.07	0.09	1.42
'7111	Base metals, or silver or gold, clad w plat, nfw than semi-manufactured	0.32	0.19	0.07	0.44	0.16	0.57	0.21	0.66	0.65	0.65	-0.99	-0.98	-0.78	0.05	12.80
'7112	Waste & scrap of precious metal	0.51	0.55	0.52	0.57	0.53	0.59	0.63	0.67	0.68	0.67	0.68	0.45	0.47	0.58	0.14
'7113	Articles of jewellery&parts thereof	-0.07	-0.05	-0.02	0.03	0.08	0.14	0.07	0.13	0.09	0.07	0.03	-0.05	0.05	0.04	1.75
'7114	Articles of goldsmith's/silversmith's wares&pts	-0.29	-0.23	-0.43	-0.41	-0.33	-0.45	-0.40	-0.69	-0.84	-0.86	-0.94	-0.78	-0.79	-0.57	-0.44
'7115	Articles of precious metal or metal clad with precious metal, nes	0.13	0.12	0.13	0.01	-0.05	-0.30	-0.32	0.07	-0.08	0.00	-0.48	-0.74	-0.68	-0.17	-1.82
'7116	Articles of natural or cultured pearls, prec/semi prec stones	0.58	0.64	0.67	0.74	0.76	0.76	0.80	0.74	0.72	0.72	0.56	0.56	0.42	0.67	0.16
'7117	Imitation jewellery	-0.28	-0.30	-0.31	-0.37	-0.37	-0.27	-0.32	-0.27	-0.35	-0.32	-0.25	-0.26	-0.28	-0.30	-0.13
'7118	Coin	-0.44	-0.47	-0.53	-0.26	-0.28	-0.11	0.11	0.09	-0.18	0.17	0.60	0.47	0.25	-0.05	-7.78

Table 5 - Revealed Symmetric Comparative Advantage (RSCA-USA)

Source: Author's calculations based on HS data from the International Trade Cente's (ITC) database.

Table 5 shows indices for Laursen's (1998) RSCA. United States of America holds Revealed Symmetric Comparative Advantage in twelve commodities which are Diamonds, not mounted or set (7102), Precious & semi-precious stone, not strug (7103), Syn/reconstr prec/semi-prec stones, not strg/mounted/set (7104), Dust&powder of precious or semi-precious stones (7105), Base metals clad with silver, nfw than semi-manufactured (7107), Gold unwrought or in semi-manuf forms (7108), Base metals or silver, clad with gold, nfw than semi-manufactured (7109), Platinum, unwrought or in semi manufactured forms (7110), Base metals, silver or gold, clad w plat, nfw than semi-manufactured (7111), Waste & scrap of precious metal (7112), Articles of jewellery parts thereof (7113) and Articles of natural or cultured pearls, prec/semi prec stones (7116). The Table 5 values confirms the values of RCA of Table 3, by showing advantage in exporting commodities with HS-Codes 7102, 7103, 7104, 7105, 7107, 7108, 7109, 7110, 7111, 7112, 7113, 7116. Coin (7118) showed Revealed Comparative Advantage, but, the RSCA table gives a clear picture by dealing with the asymmetry of the RCA and gives the value of export competitiveness in the range of -1 and +1 which eliminates HS-Code 7118 from Table 5 to show export competitiveness. Waste & scrap of precious metal (7112), Articles of natural or cultured pearls, prec/semi prec stones (7116) have maximum mean value of 0.58 and 0.64 and a minimum variation of 14% and 16% respectively, thus making them reliable and better commodities for export. This gives a clear and better picture of Export Competitiveness as the RSCA values deals with the shortcomings and asymmetry of RCA values. Pearls, nat or cult, etc (7101), Silver, unwrght or in semi-manuf. form (7106), Articles of goldsmith's/silversmith's wares&pts (7114), Articles of precious metal or metal clad with precious metal, nes (7115), Imitation Jewellery (7117), Coin (7118) showed Export Comparative Disadvantage for United States of America for the study period.

RSCA Analysis
- **India**

Table 6 shows the indices for Vollrath (1989) alternative specification for RCA, i.e., Relative Trade Advantage (RTA). India holds relative trade advantage in ten commodities which are Pearls, nat or cult, etc (7101), Diamonds, not mounted or set (7102) and Precious & semi-precious stone, not strug (7103), Dust&powder of precious or semi-precious stones (7105), Base metals, silver or gold, clad w plat, nfw than semi-manufactured (7111), Waste & scrap of precious metal (7112), Articles of jewellery parts thereof (7113), Articles of goldsmith's/silversmith's wares&pts

Code	Product label	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean	CV
'7101	Pearls, nat or cult, etc	-0.24	-0.11	-0.11	1.09	-0.10	-0.08	-0.05	-0.06	-0.08	-0.22	-0.17	-0.20	1.22	0.07	7.19
'7102	Diamonds, not mounted or set	5.49	4.57	6.24	3.79	4.87	5.70	6.76	5.79	4.71	1.96	3.74	4.11	4.37	4.78	0.26
'7103	Precious & semi-precious stone, not strug,	10.35	9.81	8.65	7.94	6.91	5.24	4.05	3.92	2.55	0.83	1.18	0.66	2.56	4.97	0.69
'7104	Syn/reconstr prec/semi-prec stones, not strg/mounted/set	0.43	-0.12	-0.95	-0.46	-0.65	-0.59	-1.12	0.86	0.20	-0.36	0.23	-0.14	-1.84	-0.34	-2.11
'7105	Dust&powder of precious or semi-precious stones	4.84	6.37	0.91	4.47	5.31	1.21	2.80	0.20	26.15	5.58	8.05	0.74	5.17	5.52	1.21
'7106	Silver,unwrght or in semi-manuf. form	-18.33	-12.74	-10.80	-6.66	-9.28	-0.61	-5.42	-6.37	-1.41	-3.28	-5.22	-2.33	-6.26	-6.82	-0.73
'7107	Base metals clad with silver, nfw than semi-manufactured	-4.49	0.11	-0.35	-0.02	-0.10	-0.09	0.03	0.05	0.00	0.03	1.64	0.11	-0.35	-0.26	-5.16
'7108	Gold unwrought or in semi-manuf forms	-25.94	-14.51	-16.17	-19.97	-19.16	-18.23	-16.18	-9.97	-13.80	-14.14	-11.72	-9.43	-7.26	-15.11	-0.33
'7109	Base metals or silver, clad with gold, nfw than semi-manufactured	0.01	-0.44	0.48	-0.18	0.03	0.05	-0.79	-0.19	-0.77	-0.07	0.00	0.00	-7.72	-0.74	-2.88
'7110	Platinum, unwrought or in semimanufactured forms	-0.02	-0.08	-0.13	-0.12	-0.10	-0.11	-0.09	-0.65	-0.69	-0.22	-0.22	-0.29	-0.27	-0.23	-0.92
'7111	Base metals, or silver or gold, clad w plat, nfw than semi-manufactured	1.02	0.01	0.17	0.02	0.99	2.57	0.09	0.07	-0.01	0.87	0.00	-0.01	-0.01	0.45	1.70
'7112	Waste & scrap of precious metal	0.01	0.01	0.07	0.08	0.48	1.01	1.13	.62	0.45	0.92	0.93	1.23	1.00	0.61	0.75
'7113	Articles of jewellery&parts thereof	7.74	7.80	8.68	11.24	9.73	11.12	9.85	7.44	14.09	8.83	10.04	8.35	5.27	9.25	0.24
'7114	Articles of goldsmith's/silversmith's wares&pts	0.49	1.81	1.54	5.96	6.14	19.09	3.15	0.44	44.84	14.27	10.02	21.61	1.84	10.09	1.25
'7115	Articles of precious metal or metal clad with precious metal, nes	0.37	-0.20	-0.56	-0.45	-0.11	-0.11	-0.10	-0.06	-0.04	0.05	-0.04	-0.15	-0.03	-0.11	-2.04
'7116	Articles of natural or cultured pearls, prec/semi prec stones	0.05	1.83	2.14	1.38	0.38	0.03	0.00	0.04	0.17	0.27	0.14	0.15	0.19	0.52	1.43
'7117	Imitation jewellery	2.19	2.17	2.13	19.11	11.82	2.55	2.12	2.46	2.41	1.86	3.28	3.56	2.65	4.49	1.14
'7118	Coin	-22.07	-25.90	-10.36	-0.78	0.01	2.13	-0.02	0.37	7.12	27.75	0.29	0.43	0.01	-1.62	-8.10

Source: Author's calculations based on HS data from the International Trade Cente's (ITC) database.

(7114), Articles of natural or cultured pearls, prec/semi prec stone (7116), Imitation Jewellery (7117). All the other eight commodities have their mean RTA value <0, thus showing a Relative Trade Disadvantage in the Gems & Jewellery sector. Both the commodities Silver, unwrght or in semi-manuf. Form (7106) and Gold unwrought or in semi-manuf forms (7108) have relative disadvantage continuously over the study period. This says that both the commodities are not advantageous for India as they have shown signs of Repeated Trade Advantage. Both the commodities also show repeated comparative disadvantage of -0.85 and -0.91 respectively from the RSCA indices (Table 4). Thus the two commodities are not of much significant importance for India. The increase in the number of commodities from six as seen in Table 4 having Export Advantage to ten commodities having Relative Trade Advantage suggests a contradictory result which states India does export the four commodities (Pearls, nat or cult, etc (7101), Base metals, silver or gold, clad w plat, nfw than semi-manufactured (7111), Waste & scrap of precious metal (7112)), Imitation Jewellery (7117) but the four commodities doesn't hold an Export Advantage in the RSCA Table 4 as such because of high domestic consumption as Indians are fascinated with Gems & Jewellery from an ancient times. So, these commodities only possess trade advantage, and not export advantage.

- *USA*

Code	Product label	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean	CV
'7101	Pearls, nat or cult, etc	-1.04	-0.89	-0.91	-1.06	-0.70	-0.97	-0.88	-0.96	-0.75	-1.14	-0.87	-0.76	-0.40	-0.87	-0.22
'7102	Diamonds, not mounted or set	-0.51	-0.41	-0.39	-0.18	-0.04	-0.06	-0.03	0.19	0.11	0.12	0.24	0.20	0.20	-0.05	-5.71
'7103	Precious & semi-precious stone, not strug,	-0.88	-0.82	-0.68	-.35	-0.47	-0.56	-0.42	-0.48	0.01	-0.34	0.38	0.57	0.90	-0.24	-2.27
'7104	Syn/reconstr prec/semi-prec stones, not strg/mounted/set	0.13	0.28	0.44	0.64	0.58	0.69	0.51	0.68	0.28	1.00	1.11	0.95	0.88	0.63	0.48
'7105	Dust&powder of precious or semi-precious stones	1.33	1.68	1.43	1.46	1.21	1.06	1.22	1.12	0.24	0.23	0.38	1.20	1.07	1.05	0.45
'7106	Silver,unwrght or in semi-manuf. form	-0.25	-0.39	-0.72	-0.60	-0.63	0.03	-0.51	-0.57	-0.34	-0.55	-0.79	-0.74	-1.05	-0.55	-0.50
'7107	Base metals clad with silver, nfw than semi-manufactured	4.49	4.48	1.19	1.68	1.08	1.71	1.66	2.46	3.04	2.90	3.35	3.79	4.74	2.81	0.46
'7108	Gold unwrought or in semi-manuf forms	1.39	0.79	0.96	0.54	1.01	0.92	1.65	1.60	0.45	0.46	0.72	0.84	0.80	0.93	0.43
'7109	Base metals or silver, clad with gold, nfw than semi-manufactured	0.79	1.02	1.08	1.14	1.66	3.14	4.82	4.31	3.97	3.18	2.42	3.55	3.22	2.64	0.52
'7110	Platinum, unwrought or in semimanufactured forms	-0.52	0.48	-0.20	-0.37	-0.21	0.30	-0.28	-0.22	-0.08	0.20	-0.09	-0.33	-0.27	-0.12	-2.35
'7111	Base metals, or silver or gold, clad w plat, nfw than semi-manufactured	1.68	1.04	0.81	2.38	1.29	3.59	1.47	4.89	4.75	1.09	-0.05	-0.07	0.04	1.76	0.96
'7112	Waste & scrap of precious metal	2.63	3.04	2.70	3.07	2.78	3.29	3.60	4.40	4.28	4.27	4.40	1.53	1.56	3.20	0.31
'7113	Articles of jewellery&parts thereof	-0.88	-0.82	-0.77	-0.64	-0.52	-0.35	-0.46	0.03	0.16	0.14	0.20	0.23	0.47	-0.25	-1.89
'7114	Articles of goldsmith's/silversmith's wares&pts	-0.25	-0.22	-0.09	-0.17	-0.15	-0.01	-0.06	-0.37	0.04	0.00	-0.08	-0.03	-0.03	-0.11	-1.07
'7115	Articles of precious metal or metal clad with precious metal, nes	1.04	1.05	1.00	0.76	0.61	-0.57	-0.28	-0.66	-2.55	-1.23	-1.90	-1.32	-0.38	-0.34	-3.50
'7116	Articles of natural or cultured pearls, prec/semi prec stones	1.94	2.66	2.69	4.17	4.43	4.75	5.95	3.32	3.53	3.15	0.39	0.72	0.51	2.94	0.58
'7117	Imitation jewellery	-1.08	-1.16	-1.16	-0.95	-1.11	-1.01	-1.14	-1.07	-1.33	-1.40	-1.29	-1.37	-1.37	-1.19	-0.13
'7118	Coin	0.00	-0.37	-0.09	-1.26	-0.82	-0.70	0.31	-0.52	-0.27	1.12	3.56	2.26	1.24	0.34	3.98

Source: Author's calculations based on HS data from the International Trade Cente's (ITC) database.

Table 7 shows the indices for Vollrath (1989) alternative specification for RCA, i.e., relative trade advantage (RTA). United States of America holds relative trade advantage in nine commodities which are Syn/reconstr prec/semi-prec stones, not strg/mounted/set (7104), Dust&powder of precious or semi-precious stones (7105), Base metals clad with silver, nfw than semi-manufactured (7107), Gold unwrought or in semi-manuf forms (7108), Base metals or silver, clad with gold, nfw than semi-manufactured (7109), Base metals, silver or gold, clad w plat, nfw than semi-manufactured (7111), Waste & scrap of precious metal (7112), Articles of natural or cultured pearls, prec/semi prec stones (7116) and Coin (7118). All the other nine commodities have their mean RTA value <0, thus showing a relative trade disadvantage in the Gems & Jewellery sector. HS Code 7101 (Pearls, nat or cult, etc) and 7117 (Imitation Jewellery) have relative trade disadvantage continuously over the thirteen years. This says that both the commodities are not advantageous for USA as they have shown signs of repeated trade disadvantage. Thus, this commodity is not of much significant importance for United States of America. From Table 7, commodities Diamonds, not mounted or set (7102) and Articles of jewellery parts thereof (7113) has shown gradual increase in RTA values starting from 2008. But the variation is lesser for HS Code Articles of jewellery parts thereof (7113) (-189%) than Diamonds, not mounted or set (7102) (-571%) making HS Code-7113 advantageous for future trade by United States of America. From Table 7, commodities Diamonds, not mounted or set (7102) and Articles of jewellery parts thereof (7113) has shown gradual increase in RTA values starting from 2008. But the variation is lesser for HS Code Articles of jewellery parts thereof (7113) (-189%) than Diamonds, not mounted or set (7102) (-571%) making HS Code-7113 advantageous for future trade by United States of America. The commodities Diamonds, not mounted or set (7102), Precious & semi-precious stone, not strug (7103), Platinum, unwrought or in semi manufactured forms (7110), Articles of jewellery parts thereof (7113) showed Revealed Symmetric Comparative Advantage (Table 5), but when their imports were considered these commodities did not show trade advantage as they were exported less and were imported to a greater extent.

Consistency and Stability of Revealed Comparative Advantage

Table 8								
Consistency of Revealed Comparative Advantage Indices (Two Digit Level)								
Gems & Jewellery 71								
Caedinal	**RCA**	**RTA**	**RSCA**		**Ordinal**	**RCA**	**RTA**	**RSCA**
RCA	1	0.491	.984**		**RCA**	1	0.462	.996**
RTA	0.491	1	0.515		**RTA**	0.462	1	0.461
RSCA	.984**	0.515	1		**RSCA**	.996*	0.461	1
Source: Author's calculations based on HS data from the International Trade Cente's (ITC) database. **. Correlation is significant at the 0.01 level (2-tailed)								

A correlation is performed to measure the consistency of the three indices. The consistency test for cardinality is based on Karl Pearson correlation coefficient, whereas, the ordinality is based on Spearman rho's rank correlation coefficient for each pair of indices. Table 8 shows the result at 2-digit level of HS classification for the Gems & Jewellery commodities (7101-7118). From the cardinality test, 49.1% and 98.4% of variation in RCA is explained by RTA and RSCA respectively and vice-versa. Similarly 51.5% of variation is RSCA is explained by RTA and vice-versa as both the variables are linear in nature. It is clear from the table that for both cardinality and ordinality tests, Revealed Comparative Advantage (RCA) with Revealed Symmetric Comparative Advantage (RSCA) holds a high degree of correlation, i.e., 0.984 and 0.996 respectively as they are both measuring Export Competitiveness. In case of correlation between Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) with Relative Trade Advantage (RTA), the degree of correlation is moderate for both as, RCA and RSCA only measures Export Competitiveness and on the other hand, RTA also takes into consideration, thus giving the total Trade Advantage.

Conclusion

This study gives a broad overview and analyses the Export Competitiveness of the Gems &

Jewellery Industry for India and its immediate competitor the USA by considering Balassa's (1965), Laursen's (1998) and Vollrath (1989) indices at 2 & 4-digit level of HS Classification for a time period of 2001-2013. The Data Analysis gives a clear view about the country that holds higher Export Comparative Advantage as well as Trade Advantage. The study also talks in detail about the commodities in which a country holds Export Advantage, the commodities in which it hold Export Disadvantage and also the commodities which could be focussed upon in order to increase Export Advantage.

After studying all the three indices it can be inferred that United States of America holds the highest Revealed Comparative Advantage with a variation of only 7% (Table 1). USA holds Export Comparative Advantage in twelve commodities with the highest in Waste & scrap of precious metal (7112), Articles of natural or cultured pearls, prec/semi prec stones (7116) that have a minimum variation of 14% and 16% (Table 5) respectively, thus making them reliable and better commodities for export. On the other hand, USA shows Relative Trade Advantage in only nine commodities, which says, that though the commodities Diamonds, not mounted or set (7102), Precious & semi-precious stone, not strug (7103), Platinum, unwrought or in semi manufactured forms (7110), Articles of jewellery parts thereof (7113) showed Revealed Symmetric Comparative Advantage, when the imports of these commodities were considered, they appeared to be higher than their exports. Thus, these commodities do not hold trade advantage. The commodity Articles of jewellery parts thereof (7113) has shown gradual increase in RTA values since 2008 with a lesser variation of -189% (Table 7) thereby, making itself advantageous for future trade by USA. Commodities Pearls, nat or cult, etc (7101) and Imitation Jewellery (7117) have shown Relative Trade Disadvantage continuously over the study period. This says that both the commodities are not advantageous for USA as they have shown signs of Relative Trade Disadvantage.

USA is given head to head competition by India when it comes to Revealed Comparative Advantage with a variation of 11% for the study period 2001-13 (Table 1). India possesses 4% lesser variation than USA which makes India more reliable for Exports than USA. India holds Export Comparative Advantage in six commodities with the highest in

Diamonds, not mounted or set (7102) that have a minimum variation of 2% (Table 4). India, unlike USA, holds Relative Trade Advantage in ten commodities. The increase in the number of commodities from six to ten commodities having Relative Trade Advantage (RTA) suggests a contradictory result which states that India exports the four commodities (Pearls, nat or cult, etc (7101), Base metals, silver or gold, clad w plat, nfw than semi-manufactured (7111), Waste & scrap of precious metal (7112) and Imitation Jewellery (7117)) but the four commodities doesn't hold an Export Advantage in the RSCA Table 4 as such because of high domestic consumption as Indians are fascinated with Gems & Jewellery from an ancient times. Not just lesser exports the commodities are also imported to a lesser content, thereby, making these commodities of negligible importance for Indian trade.

To conclude, this study shows that India's Gems & Jewellery sector has an overall good level of export competitiveness and comparative advantage. India also holds strong position in international framework. This industry has been playing a pivotal rule in boosting the economy, providing employment to millions of artisans and earning foreign exchange. In order to increase as well as retain this comparative advantage special focus should be given to this industry to exploit its huge potentiality. The limitation of this study provides scope for future research. To measure net trade advantage RTA has been used. However, RTA does not take into consideration Country or sector's size rendering its application inapt for comparing countries. In addition, due to time limitation the probable reasons for substantial shift in competitiveness of the and thus presents a possibility for further research. The study arouses a need to research extensively the major drivers of this industry and drawing guidelines to improve export competitiveness of India's Gems & Jewellery industry with international context.

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