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Intra-industry trade: an examination of South Africa and the BRICs

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1. Conclusions and general comments

1. Intra-industry trade (IIT) is defined as the simultaneous import and export of goods within the same industry, and the IIT data presented here essentially shows to what extent trade is balanced between South Africa and selected partners in specific lines. The methodology simply compares the differences between imports and exports as a share (or percentage) of total trade in that particular line and then uses the trade weight to aggregate these line-by-line values to a final figure for the bilateral profile. In particular, it seeks to highlight how trade in like products may be evolving between trading partners.
2. Results for South Africa conform to the expected pattern of a resource exporting – manufactures importing nation. Overall, the IIT level is modest. At the next level down for individual countries it suggests levels of roughly half to two-thirds of this aggregate value for the ‘traditional’ partners of the European Union (EU), United States (US), Japan and Australia, while for the newly-emerging BRIC countries (Brazil, Russia, India and China) and Korea it is almost exclusively in single figures, although the aberration of aircraft trade with Brazil in 2001 was noted. Within the EU a similar pattern emerges whereby the two main partners of Germany and the EU have figures that in some years rival the parent aggregated EU, while the less significant partners from Europe have figures that are all in the 0.07 to 0.13 level range. In general, the more disaggregated the analysis becomes the lower the expected IIT value, but this is not an absolute.
3. These IIT values are relatively consistent over the 15-year period, with evidence of an upward trend through to the disruption caused by the global trade problems of 2008 – 2009, although the UK and Germany have shown much more variance.
4. We go on to analyse the IIT values for the BRIC countries and Japan using the same World Trade Atlas (WTA) trade data source for consistency. Reassuringly, their ‘mirror’ values for trade with South Africa are close, but not exactly the same, as those reported from South African data. The use of ‘special transactions’ as an HS classification may bias the IIT results, and this may be a factor operating here, albeit a minor one. We have also completed the BRIC matrix of IIT trade from each of the respective partners, and similarly found consistent results. These intra-BRIC intra-industry trade values are all low, and, in the case of Russia, extremely low. Again, except for Russia, the IIT between each of the BRICs and the world is very consistently in the

0.30 to 0.49 level, as are their IIT values with the EU. Those with the USA show more variation, with levels for Brazil and India being similar to the EU figures, South Africa and China being little more than half the EU figures and Russia clearly showing the unsophisticated nature of its trading profile by having extremely low levels of IIT with both the EU and USA (and indeed with Japan even more so).

5. Japan was analysed as a comparator study, and the results show a consistently sophisticated trading pattern for the world, EU, USA, China and Korea, but a very low level profile with the other BRICs (Brazil, Russia and India). South Africa is in-between although nearer to the remaining BRICs.
6. Continuing with the BRIC theme that tralac has been championing we examined the IIT values for these countries, and also those for Japan. China shows a strong engagement with the world as a whole, with EU, Korea and Japan grouped not too far back and ahead of the USA. Other than the modest (0.09 maximum) value for Chinese - Indian trade, Chinese IIT engagement with fellow BRICs (including South Africa) is extremely low. The same general pattern is represented for both Brazil and India, although India's pattern with both Japan and Korea shows very low IIT and intra-BRIC values, while still modest are marginally above China's comparable levels. Russia is certainly the exception to this BRIC pattern, as its overall global engagement IIT value with the world is just below 50% of the other BRICs and its intra-BRIC trade displays almost non-existent IIT values in some cases.
7. The next step was to examine the sector profile for South Africa. Here IIT values for agriculture and base metals have been stable, manufacturing has been steadily increasing, while values for textile/clothing/footwear (TCF) declined dramatically from 2003. The increasing values found in the general manufacturing sector are an indication that South Africa is becoming more integrated in the global manufacturing trade, although the data also suggests that the motor vehicle trade has an impact on the level of our IIT values.
8. Finally, we analysed IIT in the Tripartite (COMESA-EAC-SADC) Free Trade Agreement (T-FTA) to glean information on the degree of IIT between the potential members of this grouping to assess their level and sophistication of trade in industrial products. We consider that increasing the IIT

between these countries is an essential part of their development and that the Tripartite FTA should make a contribution to this development by enhancing trade in manufactured products.

9. Notwithstanding the data limitations we found that, aside from South Africa and Egypt, these IIT levels are low, and in some instances extremely low. This worrying trend is reinforced when we examine the IIT values for the 'majors' of Egypt, Kenya and South Africa with respect to intra-Tripartite trade and trade with the BRICs (excluding Russia). We suggest reasons as to why this may be so, and present some explanations for this and use IIT to point out how an FTA may help region development.

Introduction

World trade patterns have changed very markedly in the past few decades. International trade is no longer dominated by the simple nineteenth century Ricardian model of exchange of British cloth for Portuguese wine or the Heckscher Ohlin explanation of inter-industry trade patterns whereby a country exports some products in exchange for imports of other, quite different, products. Economists have been searching for ways to measure and assess emerging trends in trade that do not conform to the traditional patterns, and have come up with a variety of measures. The focus of this paper is on discussing and measuring intra- industry trade whereby a country both exports and imports the same or very similar products in the same industry. The emergence and growth of IIT has been more apparent between developed countries, and the objective of this paper is to assess the degree of IIT between South Africa and its leading trade partners. While emphasis will be given to South Africa, we will also examine IIT in a wider African context and between the so-called BRIC countries of Brazil, Russia, India and China now that South Africa has become what is in effect an associate of the BRICs.

Intra-industry trade is defined as the simultaneous import and export of goods within the same industry. An example for South Africa in the processed agricultural products is wine, where South Africa both exports wine to and imports wine from the EU, and in vehicles and their associated parts where a great deal of trade takes place. From a policy perspective, it is often argued that adjustment costs are lower when new trade is of the intra-industry type because disruption is minimised when

adjustment takes place within an industry. It is easier to transfer and adapt resources within industries than to switch them from one industry to another.

Measuring intra-industry trade

A number of attempts have been made to find a suitable method of measuring intra-industry trade and these have been discussed at length in the literature. Grubel and Lloyd were the first economists to seek to measure the significance of intra-industry trade. They measured IIT as the proportion (percent) of a country's total trade in the products of a given industry which was matched or balanced between exports and imports, and the Grubel-Lloyd (G-L) Index remains the main formula for measurement of this trade in similar items. It can be used to examine just individual trade lines at a given degree of disaggregation, sectors of these trade lines, or the more the aggregated index for total trade. The Grubel-Lloyd Index varies between zero (indicating no intra-industry trade) and one (indicating pure intra-industry trade). However, the results that one finds for the Grubel-Lloyd Index depend to a large extent on the degree to which one's data is disaggregated, with more disaggregation leading to less evidence of intra-industry trade.

One rather uncomfortable match is that the G-L Index measures trade in specific industrial sectors, and while trade is generally measure by trade classification industry is measured by industry classifications. The standard trade classification is the internationally accepted and applied Harmonised System (HS) which can be systematically disaggregated into more and more specific components, while the Standard Industry Trade Classification (SITC) applies to industry sectors and can similarly be disaggregated. There are concordance tables to assess the transformations from SITC to HS codes, but for the purpose of this paper we will use the HS trade codes only while acknowledging that this method is not perfect. We will also note that trade data is not perfect, especially when compared between trade partners (the reconciliation problem). One problem highlighted in South African trade data is the use of special classifications for the export of gold and the importation of motor vehicles, both of which are classified outside of the standard HS system, thus making concise line-by-line comparisons difficult.

In general, IIT has been found to have risen significantly since the 1980s in most developed and 'open'¹ countries and is highest for more sophisticated manufactured products. It has also been

¹ 'open' in the sense that they are able to both export and import with relative freedom.

linked to investment flows from outside, especially where there is an intra-firm aspect of these investment and subsequent trade flows.

The G-L Index measures intra-industry trade as a percentage of a country's total trade. For an individual product line or group (i) the share of IIT is formulated as

$$GL_i = 1 - (|X_i - M_i| / (X_i + M_i))$$

where X_i and M_i stand respectively for the exports and imports of industry (i). If all trade was balanced GL_i would equal 1, and conversely, if all trade was one-way, GL_i would equal zero. Thus, the closer GL_i is to 1 (i.e. the more imports equal exports), the more trade in industry (i) is IIT. The closer GL_i is to zero (where either exports or imports equal zero), the more trade in industry (i) is inter-industry trade. Therefore the index of intra-industry trade takes values from 0 to 1 as the extent of intra-industry trade increases, that is, $0 \leq GL_i \leq 1$.

The G-L Index above can be modified to obtain the average level of intra-industry trade for a country by aggregating all lines after weighting each line by the total trade. As the share of some products is higher than others within total trade, using a simple average of all lines would give a misleading result. Hence the most valuable G-L Index is the weighted mean for the bilateral trade relationship.

The data analysis for South Africa

In undertaking this analysis we used the WTA² annual series for South Africa, with annual December year data from 1996 to 2010 at the HS 4 digit line level. This generally gave between 1 000 to 1 200 individual lines for the respective trading partners. The data for imports and exports was lined up by the HS code using a combination of Vlookup and Pivot Table functions in Excel spreadsheets, an in calculating the total an IF³ statement was used to set the minimal total value of imports and exports at R10 (or US\$10 when using non-South African analysis) to avoid the dividing-by-zero problem where there was no trade reported. This makes an imperceptible difference to the final result, and we add that the analysis in theory should be indifferent to the currency used. We again acknowledge

² This is a commercial international data series obtained by John Brasher and his associates at Global Trade Information Services (GTIS), Inc. from the respective country authorities and placed into a user-friendly series. Currently, GTIS publishes monthly official government trade statistics for more than 80 countries representing nearly 100% of total world trade. More information can be found on <http://www.gtis.com>.

³ The 'IF' statement from an Excel worksheet to replace a zero with a minimum value to avoid dividing by zero.

the bias in South African data that may result from the special categories used by South Africa for gold exports and vehicle imports.⁴ The source for all tables is WTA data and tralac calculations.

The overall big picture for South Africa is given in Table 1. The second line of the table shows the South African world values for global trade, with these calculations in the 0.25 to 0.31 range. This data is shown in graphical form in Figure 1, where a steady increase through to 2005 followed by a stable period and then a decline in the two most recent years can be seen. Below the values for the world is a bloc showing the individual values for the BRIC countries. These values are significantly lower, and with the exception of Brazil in 2001 all are below 0.1.⁵ Next, the middle section of the table show the values for the main individual EU partners, with the aggregate EU data shown for the period 2007 to 2010 only.⁶ The largest values are for Germany and the UK, with these highlighted in Figure 3. Both values increase through to around 2001 for Germany and 2003 for the UK before declining dramatically for the UK and declining and then recovering again for Germany. Finally, the lower section shows the other significant partners of the USA, Japan, Korea and Australia. Highlighted here are 1) the consistent levels in the high teens for the US; 2) the large increases for Japan through to 2007; 3) the consistently low levels for Korea; and 4) the relatively high levels for Australia.

⁴ Many other countries use this special classification as well, for example for 'Classified' trade that is not revealed in detail.

⁵ In examining the Brazilian data for 2001 where the value jumps to 0.18 we find that during that period there were imports of aircraft (HS 8802) of R3 715 million representing 45% of the total Brazilian imports that year, with this somewhat balanced by exports to Brazil in the same line of R546 million or 24% of total exports.

⁶ We had difficulty in downloading the very large aggregated data base for the EU at HS4 level.

Table1: IIT data for South Africa, December years 1996 to 2010 inclusive for selected main non-African trading partners.

Year ending	1966	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
World	0.25	0.25	0.25	0.27	0.28	0.28	0.28	0.29	0.29	0.31	0.30	0.31	0.31	0.28	0.28
BRICs															
China	0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.05	0.05	0.04	0.03	0.03	0.02	0.02	0.02
India	0.04	0.06	0.07	0.10	0.05	0.06	0.05	0.09	0.10	0.06	0.09	0.07	0.05	0.05	0.05
Brazil	0.09	0.08	0.09	0.09	0.09	0.18	0.08	0.08	0.07	0.07	0.07	0.08	0.07	0.10	0.09
Russia	0.01	0.00	0.01	0.00	0.01	0.02	0.02	0.01	0.02	0.03	0.02	0.02	0.01	0.01	0.02
Europe															
EU 27												0.19	0.22	0.21	0.20
Germany	0.13	0.14	0.17	0.20	0.25	0.27	0.25	0.18	0.17	0.14	0.13	0.15	0.16	0.21	0.26
UK	0.20	0.23	0.23	0.29	0.31	0.30	0.30	0.30	0.27	0.18	0.20	0.15	0.13	0.12	0.10
Netherlands	0.12	0.11	0.10	0.10	0.10	0.11	0.10	0.08	0.07	0.11	0.12	0.10	0.09	0.09	0.08
Belgium	0.10	0.11	0.11	0.09	0.08	0.09	0.09	0.11	0.11	0.11	0.10	0.11	0.12	0.13	0.11
Italy	0.11	0.08	0.10	0.10	0.11	0.09	0.07	0.07	0.07	0.08	0.08	0.07	0.07	0.07	0.07
France	0.11	0.09	0.09	0.11	0.15	0.11	0.10	0.08	0.07	0.10	0.11	0.11	0.12	0.10	0.12
Spain	0.07	0.08	0.08	0.07	0.08	0.07	0.07	0.08	0.07	0.11	0.10	0.12	0.11	0.10	0.11
Other															
USA	0.12	0.14	0.13	0.14	0.15	0.15	0.17	0.20	0.20	0.18	0.17	0.16	0.13	0.14	0.16
Japan	0.01	0.01	0.02	0.02	0.07	0.06	0.07	0.10	0.12	0.15	0.17	0.17	0.11	0.11	0.10
Korea	0.03	0.03	0.03	0.02	0.03	0.02	0.02	0.02	0.03	0.03	0.02	0.01	0.02	0.06	0.06
Australia	0.11	0.14	0.12	0.13	0.12	0.13	0.12	0.16	0.12	0.18	0.14	0.17	0.14	0.15	0.15

Figure 1: IIT values between RSA and the world.

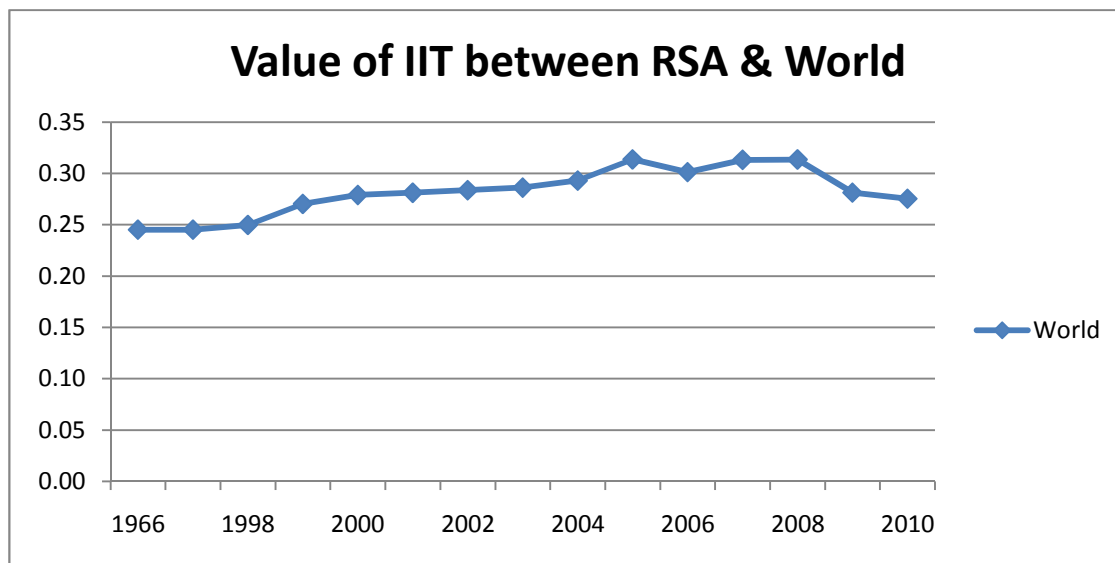


Figure 2: IIT between South Africa and the BRICs

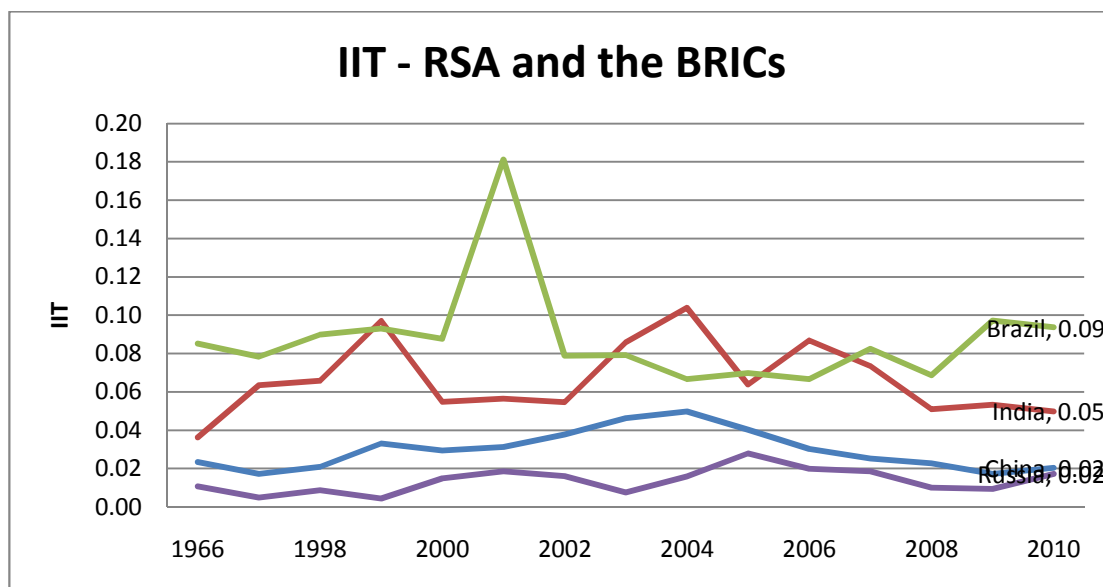


Figure 3: IIT between RSA and Germany/UK

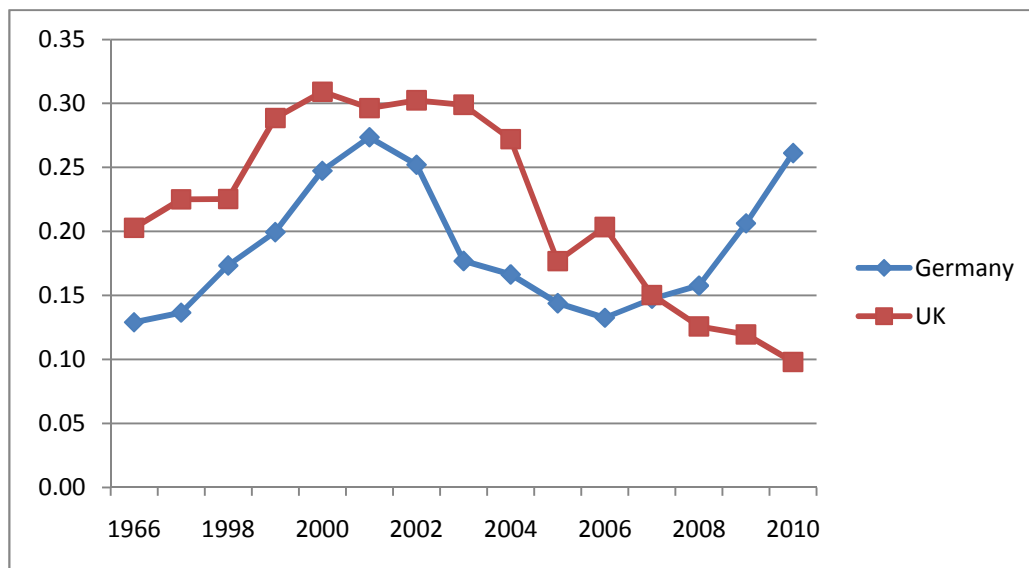


Table 2 shows the results from Table 1 above from South Africa augmented by the partner ‘mirror’ data for the BRICs and Japan to compare the values as assessed from partner trade data. Only the three most recent years of 2008, 2009 and 2010 are shown in each case. For this and the subsequent series of BRIC and Japanese table the South African values are shown on the left-hand side (from the right-hand side of Table 1) while the partner data calculated from their WTA data is shown on the right-hand side of Table 2. For South Africa, the values are reassuringly comparable in all cases.

Table 2: IIT values for South Africa and BRIC partner mirror data

Year ending	2008	2009	2010				
South Africa							
World	0.31	0.28	0.28		Partner data		
BRICs					2008	2009	2010
China	0.02	0.02	0.02		0.02	0.02	0.02
India	0.05	0.05	0.05		0.05	0.03	0.03
Brazil	0.07	0.10	0.09		0.08	0.09	0.09
Russia	0.01	0.01	0.02		0.01	0.03	0.02
Other							
Japan	0.11	0.11	0.10		0.10	0.10	0.10

The next five tables, Tables 3 to 7 inclusive, show the calculated IIT values for each of the BRIC countries and Japan as assessed from their trade data. Again, the calculations are from WTA for these countries. On the left-hand side the IIT values from the individual countries are shown for the world, the BRICs including South Africa, the EU, the USA, Japan and Korea. On the right-hand side is the ‘mirror’ data from the fellow BRICs and Japan. Following the BRIC acronym we will start with Brazil in Table 3 and then display Russia, India, China and lastly Japan in Table 7. Data in all cases is for the last three years only. This series of tables highlights that Brazil, India, China and Japan are more engaged with the world than is South Africa if the degree of IIT is used to measure a more mature global engagement. The exception is Russia, as the IIT data shows that this country is far more ‘traditional’ in the classic sense of inter-industry rather than intra-industry trade.

For Brazil, India, China and Japan the pattern is similar to that of South Africa: engagement with the world that has the full trade integration is the highest IIT Index, with this generally followed by the EU/USA. With one exception (South Africa and Brazil for 2009) intra-BRIC IIT values are all below 0.10, stressing that this BRIC trading engagement is not yet a very sophisticated one. This is even more so in the case of Russia, where the highest IIT (0.07) is between Russia, the USA and India with most of the others much lower. China’s engagement with both Japan and Korea is high, with recorded values above 0.30, while Japan itself has this level of engagement with the world, the EU, the USA and Korea as well. Indeed, it is a feature of the data that only Japan has consistently high IIT values for many partners that are actually above the Japan/world values.

Table 3: IIT for Brazil

Year ending	2008	2009	2010				
Brazil							
World	0.39	0.38	0.34		Partner data		
BRICs					2008	2009	2010
India	0.08	0.06	0.07		0.08	0.06	0.07
China	0.04	0.03	0.02		0.03	0.03	0.02
Russia	0.00	0.00	0.00		0.00	0.01	0.00
RSA*	0.08	0.09	0.09		0.07	0.10	0.09
EU 27	0.22	0.21	0.20				
USA	0.26	0.26	0.25				
Japan	0.03	0.03	0.03		0.03	0.03	0.03
Korea	0.02	0.03	0.02				

* Republic of South Africa

Table 4: IIT for Russia

Year ending	2008	2009	2010				
Russia							
World	0.14	0.16	0.12		Partner data		
BRICs					2008	2009	2010
China	0.03	0.03	0.02		0.02	0.02	0.02
India	0.06	0.05	0.07		0.03	0.05	0.03
Brazil	0.00	0.01	0.00		0.00	0.00	0.00
RSA	0.01	0.03	0.02		0.01	0.01	0.02
Europe							
EU 27	0.05	0.06	0.05				
USA	0.04	0.07	0.04				
Japan	0.01	0.01	0.01		0.01	0.02	0.01
Korea	0.02	0.03	0.02				

Table 5: IIT for India

Year ending	2008	2009	2010				
India							
World	0.33	0.31	0.31		Partner data		
BRICs					2008	2009	2010
Brazil	0.08	0.06	0.07		0.08	0.06	0.07
China	0.08	0.09	0.07		0.07	0.09	0.08
Russia	0.03	0.05	0.03		0.00	0.01	0.00
RSA	0.05	0.03	0.03		0.05	0.05	0.05
EU 27	0.33	0.29	0.31				
USA	0.24	0.26	0.26				
Japan	0.17	0.11	0.11		0.06	0.08	0.05
Korea	0.21	0.15	0.16				

Table 6: IIT for China

Year ending	2008	2009	2010				
China							
World	0.37	0.38	0.37		Partner data		
BRICs					2008	2009	2010
India	0.07	0.09	0.08		0.08	0.09	0.07
Brazil	0.03	0.03	0.02		0.04	0.03	0.02
Russia	0.02	0.02	0.02		0.03	0.03	0.02
RSA	0.02	0.02	0.02		0.02	0.02	0.02
EU 27	0.26	0.25	0.25				
USA	0.17	0.17	0.16				
Japan	0.32	0.30	0.30		0.33	0.29	0.30
Korea	0.34	0.33	0.31				

Table 7: IIT for Japan

Year ending	2008	2009	2010				
Japan							
World	0.34	0.34	0.33		Partner data		
BRICs					2008	2009	2010
China	0.33	0.29	0.30		0.32	0.30	0.30
India	0.06	0.08	0.05		0.17	0.11	0.11
Brazil	0.03	0.03	0.03		0.03	0.03	0.03
Russia	0.01	0.02	0.01		0.01	0.01	0.01
South Africa	0.10	0.10	0.10		0.11	0.11	0.10
EU 27	0.39	0.39	0.39				
USA	0.30	0.32	0.31				
Korea	0.39	0.39	0.37				

South Africa by sectors

In this section we will examine the South African IIT by aggregate HS groupings. The concept of IIT is generally applied to assess intra-industry trade in manufacturing products, so accordingly we have restricted our sector analysis to the main manufacturing products and agricultural products. These four groupings are: a) agriculture as defined by HS chapters 1 through to 24 inclusive; b) TCF (textiles, clothing and footwear) defined as HS chapters 50 to 67 inclusive; c) base metal products as defined by chapters 72 to 83 inclusive; and d) general manufacturing as defined by chapters 84 to 96 inclusive. Not analysed are mineral products; chemical and related products; chemicals, plastics and rubber products; leather and fur skin products; wood and related products; stone, ceramics and related products; precious metals; and the 'special' categories that include some vehicle imports under special customs preferences. It is only the latter that is an important omission.

Results show that the IIT values for agriculture and base metals have been stable, manufacturing has been steadily increasing, but TCF declined dramatically from 2003 when Chinese clothing imports began to increase and alter the trade balance. This latter effect, along with the modest upward trend in general manufacturing, is apparent from Figure 4 below. Importantly, note that agriculture and base metals are similar to the total trade profile, that TCF has fallen below the overall index value and that the general manufacturing sector where we would hope to find evidence of IIT is more than 50% above the overall figures. Given the importance of manufacturing (29.2% of total trade), this is advantageous, and, furthermore, given that Table 8 represents only around 50% of South Africa's

trade, it suggests that the IIT level for the excluded trade is very low. This is confirmed by looking at the final row of the table which shows the IIT values for the 51.4% of trade not included in these four sectors. This would include all exports of precious metals, trade in minerals and fuels, and the special category of motor vehicles which also somewhat changes our IIT for general manufacturing.⁷

⁷ It actually reduces the IIT for general manufacturing, and especially so in the final 2010 year from 0.50 to 0.45. This results from introducing an imbalance into the trade, and, of course, is based on the assumption that the HS 9801 actually belongs in HS 8703.

Table 8: South African IIT by selected sectors

1966	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
South Africa and the world - total trade														
0.25	0.25	0.25	0.27	0.28	0.28	0.28	0.29	0.29	0.31	0.30	0.31	0.31	0.28	0.28
Agriculture - HS chapters 1 to 24 - 7.1% of total														
0.22	0.25	0.24	0.26	0.26	0.27	0.28	0.27	0.24	0.22	0.27	0.24	0.26	0.26	0.27
TCF - HS chapters 50 to 67 - 2.1% of total														
0.37	0.37	0.40	0.43	0.44	0.45	0.45	0.45	0.40	0.34	0.27	0.27	0.26	0.21	0.20
Base metals - chapters 72 to 83 - 10.2% of total														
0.24	0.23	0.23	0.22	0.23	0.22	0.22	0.21	0.20	0.24	0.27	0.28	0.24	0.25	0.26
General manufacturing - chapters 84 to 96 - 29.2% of total														
0.32	0.37	0.34	0.39	0.43	0.43	0.43	0.43	0.46	0.49	0.45	0.45	0.45	0.47	0.50
all other trade - 51.4% of total														
0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.15	0.16	0.11	0.11

Figure 4: IIT for South African manufacturing and TCF sectors

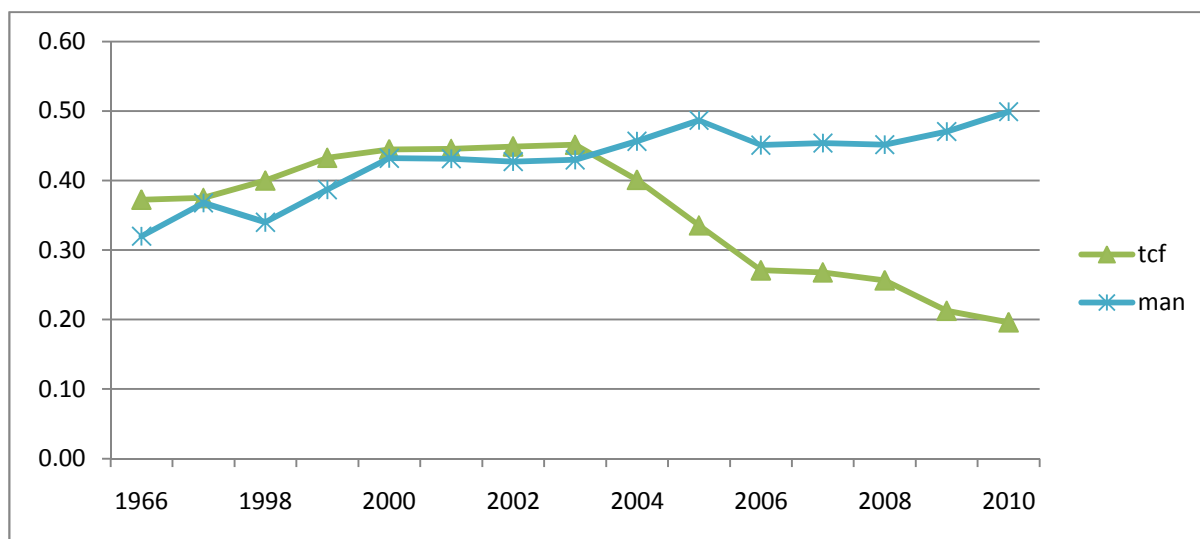


Table 9 takes the analysis further and shows the five main HS4 lines as ranked by their contribution to the overall IIT scores in their respective sectors. Column 1 shows the individual line IIT score, with this being the simple unweighted difference between exports and imports divided by the total trade in that line. Recall that for the main IIT aggregate figure this value is weighted by the ratio of total trade in the line as a percentage of total aggregate trade. Therefore a high IIT value in Column 1 will only make a major contribution to the final result if overall trade value is also high. Column 1 demonstrates how an individual line can make a contribution to the overall score by having (a) a high but perhaps unbalanced trade figure, (b) a modest but balanced trade value, or (c) some combination of these two. For example, the second line in agriculture, that of sunflower and cotton seed oils, has an IIT value of 0.094 as a result of its very balanced trade, while further down in the base metals we can see that ferro-alloys are third on this particular list with an IIT of only 0.052 but with a total trade of US\$34 billion ensuring a large weight. Notable in the final manufacturing sector, the sector where IIT is generally prominent, the motor vehicle trade is both large and balanced (although our caveat on the classification of ‘special’ for vehicle imports is noted).

Table 9: South Africa's IIT with the world – main lines in these selected sectors.

IIT line value	HS4 code	Agriculture	Trade rand (million)		
		Description of HS 4 line	Imports	Exports	Total
0.927	2106	Food preparations, nes*	1 016	878	1 894
0.964	1512	Sunflower/Cottonseed oil	786	732	1 518
0.451	2208	ethyl alcohol	2 277	663	2 940
0.795	1806	Chocolate, etc.	426	645	1 071
0.374	1701	Cane sugar	417	1 810	2 227
TCF					
0.617	5603	Nonwoven fabrics	411	183	594
0.667	6306	Tarpaulins, sails for boats, etc.	147	293	440
0.559	5201	Cotton, raw	363	141	504
0.189	6203	Men's or boys' suits, etc.	1 249	130	1 379
0.896	5703	Carpets	111	137	247
Base Metals					
0.971	7210	Flat-rolled iron	1 835	1 945	3 780
0.972	8207	Transformers	952	1 007	1 959
0.052	7202	Ferro-alloys	904	34 073	34 977
0.840	7326	Articles iron/steel nes	1 068	774	1 841
0.141	7601	Unwrought aluminium	684	9 013	9 696
General manufacturing					
0.995	8703	Vehicles	29 722	30 033	59 755
0.809	8704	Vehicles for goods	5 798	8 529	14 327
0.780	8708	Parts motor vehicles	8 715	5 570	14 286
0.303	8421	Centrifuges, etc.	2 845	15 940	18 785
0.762	9401	Seats	2 037	3 311	5 348

* Not elsewhere specified

Table 10 shows the same sectorial breakdown for South African trade with China. Agricultural products show the highest IIT values, followed by base metals. General manufacturing is very low, while TFC hardly registers (despite exports of South African raw wool to China being included in TCF).

Table 9: South Africa's IIT with China selected sectors.

1966	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
South Africa and China – total trade of R140 199 million during 2010														
0.02	0.02	0.03	0.04	0.03	0.05	0.06	0.06	0.08	0.06	0.04	0.04	0.03	0.02	0.02
Agriculture – HS chapters 1 to 24 – 1.9% total														
0.02	0.02	0.03	0.04	0.04	0.10	0.11	0.13	0.17	0.12	0.11	0.05	0.06	0.08	0.08
TCF – HS chapters 50 to 67 – 8.6% total														
0.00	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Base metals – chapters 72 to 83 – 11.4% of total														
0.01	0.02	0.04	0.09	0.05	0.04	0.09	0.05	0.10	0.08	0.06	0.05	0.05	0.03	0.02
General manufacturing – chapters 84 to 96 – 33.7 % of total														
0.03	0.02	0.02	0.03	0.02	0.04	0.03	0.05	0.06	0.04	0.03	0.02	0.02	0.02	0.02

Intra-industry trade in the COMESA-EAC-SADC region

In June 2011, negotiations towards the establishment of a grand free trade area comprising members of the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC) and the Southern African Development Community (SADC) were launched at a summit held in South Africa. The intention behind this grand FTA commonly referred to as the Tripartite FTA is to allow the duty-free, quota-free flow of goods and services, and the free movement of business people between the countries in these regions.

At the Summit, Heads of State adopted a developmental approach to the integration process that anchors on three pillars, namely:

- Market integration;
- Infrastructure development; and
- Industrial development.

The Tripartite FTA between the three regional economic communities (RECs) would be an expanded trade bloc comprising 26 countries that make up half of the Africa Union's (AU) membership. The new bloc will have a combined population and gross domestic product (GDP) of more than 580 million people and about US\$1 trillion respectively with a per capita GDP averaging US\$1 600. Average life expectancy at birth for the T-FTA countries is around 56 years. The region also has a high trade to GDP ratio, averaging around 73%, an indication that these countries are more economically sensitive to changes in the level of global trade than countries with a low ratio (such as Japan).⁸ Hopefully, this T-FTA will promote and increase Africa's share of global trade, which, despite experiencing exceptional growth in the past decade, remains low and is heavily concentrated in natural resources.

Export diversification, industrial development and the role of IIT

The drive towards the reduction of dependence on primary commodity exports and increasing volumes of manufactured or assembled exports has been the focus of many developing countries in the last few decades. There is widespread agreement that industrial development is the primary foundation upon which advanced societies have been built and is one reason why industrial policy

⁸ tralac calculations based on World Bank Indicators data.

has become a major preoccupation of policy makers in developing countries (Altman and Mayer, 2003).

The envisaged T-FTA must entail more than just tariff liberalisation. Member states have realised that there is a need for movement away from the production and trade of similar primary resource-based goods which have very little value addition, and the focus must be more on the diversification of the export base through the production of higher-value-added goods and the promotion of intra-regional trade. Indeed, according to the Africa Competitiveness Report (2011), African countries have much to gain by diversifying exports and by further opening up regional trade. African countries must become be integrated into the world economy and develop stronger and more sophisticated export sectors in order to maintain and achieve sustained growth.

It is assumed that diversification of production will lead to export diversification due to liberalisation and as a result of specialisation, thus introducing some competition for both the domestic and international markets with international producers. In the final stage of economic diversification, specialisation is likely to take place within sectors, leading to productivity gains through the exploitation of increasing returns to scale. Access to a larger market permits firms to increase plant size and/or engage in more plant specialisation, resulting in longer production runs and thus reducing unit costs. This gives rise to intra-industry specialisation and trade, and more products being produced profitably, in this way generating export diversity (Pettersson, 2005). The objective for this section is therefore to examine the state of IIT in the T-FTA region to provide some indication of the base that the region is working from.

The analysis

Our analysis will concentrate only on manufactures trade due to the fact that countries are increasingly aiming to diversify exports and move away from trade in primary-based products with their relatively low value-addition contributions to the economy. In this section we use the International Standard for Industrial Classification (ISIC) Revision 4 codes that are translated to the HS classification to guide us in the selection process rather than the HS4 lines as used above, and our data source changes to the International Trade Centre (ITC) TradeMap database. A brief discussion of the G-L Index has already been highlighted in earlier sections, and we continue to use data at the 4-digit Harmonised System (HS) level of product classification that has been coordinated with the

ISIC data rather than the arbitrary ‘Manufacturing’ classification used above in Tables 8 and 9. We again note the limitations of trade data, and, for this section more especially, access to reliable African trade data as they do impact on the analysis. Furthermore, as trade data may be distorted or simply not reported for a given year, we take the averages of two time periods, 2005-2007 and 2008-2010 (with 2010 again the latest available year for all countries under review). We must therefore treat the analysis as indicative of trade flows over the review period.

The results

Table 10 provides an indication of the IIT development for the T-FTA countries over the last six years, and in relation to comparator countries. If we are to consider the level of IIT as indicative of the level of industrial development, the data confirms that T-FTA countries as a group do not have highly advanced industrial bases. The IIT levels range from a mere 1% (Djibouti) to a maximum of 37% (South Africa) and averaging 14%. The bulk of the industrial sectors in these countries are primary resource based concentrated in agro- and food-processing products. Manufacturing value-addition is generally low and activities are restricted to the first stage of processing or the final stage of blending. South Africa is the only T-FTA country with a complex manufacturing base. Other countries such as Egypt, Kenya and Mauritius also fare better than average. Zimbabwe, which before the political impasse in that country used to be the second largest manufacturer in SADC after SADC, has little left other than a collapsed industrial base that is slowly recovering from the decade-long economic crisis.

The comparator countries reveal that with the exception of South Africa (and to a certain extent Egypt) the T-FTA countries compare unfavourably with other developing countries such as China, Brazil and India. India and China have the highest IIT levels amongst the developing country comparators exhibiting levels of over 40%⁹ despite having per capita income levels that are relatively comparable with the major trading T-FTA countries such as South Africa, Kenya, Botswana and Egypt. To the extent that IIT levels conform to the level of a country’s development, the poorer T-FTA member countries have small to virtually no industrial bases. This reinforces the general notion that IIT levels increase with the level of a country’s economic development.

⁹ This figure cannot be directly compared with the BRIC analysis above as we are using a different definition of ‘manufacturing’ here.

We also note that over the review period there has been no significant change to the IIT levels, and indeed some countries are experiencing a decline in IIT levels. However, we caution that this decline may be a result of either the impact of the global crisis on trade or simply a case of missing or non-reported trade – a common caveat to analysing African trade data in general. It is quite clear that despite this shortcoming, the picture depicted is relatively similar to the case on the ground, where no major industrial development initiatives have boosted the industrial base in the respective countries or regions despite repeated calls and strategies for enhancing industrial development being made with little success or lack of implementation and monitoring capability.

As an example, one country which experienced a significant decline over the review period was Burundi, which had an IIT of 20% in the period 2005-2007 but currently stands at a significantly lower 7%. Despite the country currently having a small manufacturing base, thus significantly limiting its impact on the overall economy, this was not always the case. Pre-crisis governments adopted pro-manufacturing policies, and this led to the growth of a modest industrial base. However, the crisis was particularly devastating for Burundi's manufacturing sector; it shrank dramatically, and by 2006 accounted for only 6.7% of exports. Nearly half of production comes from food industries, including alcoholic beverages, carbonated beverages, cigarettes, sugar and groundnut oil (EAC, 2010).

Looking at the region as whole, products that exhibit high levels of IIT include products classified mainly under Textiles and Clothing (T&C), processed agricultural products and, to a certain extent, processed mineral products such as iron and steel (albeit from a low base with respect to total trade value). We caution, however, that the increased IIT levels may be a result of re-exports¹⁰ especially within the T&C sector, but also a case of high intra-regional trade in those particular products. The latter notion was confirmed by Havrylyshyn and Kunzel (1997), who noted that 'one should expect that countries exhibit larger amounts of intra-industry trade within a unified trade or geographical area for proximity reasons'. This is mainly because the cost of information for trading differentiated products is higher than for standardised products and increases with distance.

¹⁰ Usually re-exports do not account for significant amounts of total IIT but may be important for countries that are natural ports or routing ways.

Table10: Intra-industry trade indices for manufactures (total trade)

Country	2005-2007	2008-2010		Country	2005-2007	2008-2010
Angola	0.05	0.08		Seychelles	0.31	0.19
Botswana	0.09	0.21		South Africa	0.38	0.37
Burundi	0.2	0.07		Sudan	0.08	0.04
Comoros	0.07	0.05		Swaziland	0.2	0.16
Djibouti	0.26	0.01		Tanzania	0.09	0.12
DRC	0.03	0.05		Uganda	0.18	0.24
Egypt	0.28	0.3		Zambia	0.06	0.12
Eritrea	0.06	0.08		Zimbabwe	0.13	0.19
Ethiopia	0.03	0.04				
Kenya	0.25	0.21		Comparator developing countries		
Lesotho	0.07	0.02		Brazil	0.37	0.36
Libya	0.15	0.16		China	0.4	0.4
Madagascar	0.14	0.13		India	0.4	0.42
Malawi	0.07	0.07				
Mauritius	0.16	0.17		Comparator developed countries		
Mozambique	0.09	0.1		EU	0.87	0.86
Namibia	0.16	0.16		US	0.57	0.62
Rwanda	0.06	0.06				

Source: ITC TradeMap Database and author's calculations

Table 11 examines (a) the direction of trade shares for manufacturing products for Egypt, Kenya and South Africa and compares this information with that for Brazil, India and China and (b) the IIT levels for this trade. If, as generally accepted, the cost of information for differentiated products is higher and increases with distance, this does not seem to be represented by the data in Table 11 with the exception of Kenya which has higher IIT levels for the T-FTA (24%) region than the world (21%). South Africa and Egypt do not exhibit this trend and several explanations for this can be suggested:

- These countries compete with highly efficient low-cost producers of manufactures for the regional market, thus partly explaining the low levels of trade within the T-FTA relative to total trade, with South Africa only trading 7% and Egypt a mere 4% of manufactures within the region.

- Costs of doing business and other barriers to trade are still prevalent in the region, making it difficult for T-FTA countries to penetrate and compete in these regional markets.
- The traditional North-South trading partnerships still offer a lucrative market and the fact that countries have established long-term relationships and have preferential access to some of these markets acts as a disincentive for exporters to look for alternative and closer markets despite the preferences they offer. The dominance of the EU in the trade with countries highlighted in Table 11 attests to this notion. IIT levels are at 19% for Egypt and 24% for South Africa while bilateral trade in manufactures for these countries stands at a relatively higher 27% and 25% respectively. Even with comparator countries, this trend is quite clear.

Table 11: Direction of trade and related intra-industry indices in manufactures (2008-2010)

	World IIT value	T-FTA IIT value	T-FTA trade (% world)	BRIC IIT value	BRICs trade world) (%)	EU IIT value	EU trade (% world)
Egypt	0.30	0.08	4	0.12	13	0.19	27
Kenya	0.21	0.24	19	0.02	20	0.02	15
South Africa	0.37	0.10	7	0.08	13	0.24	25
Comparator countries							
Brazil	0.36	0.06	2	0.09	13	0.23	20
India	0.42	0.10	3	0.17	11	0.33	16
China	0.40	0.02	1	0.28	9	0.26	16

Source: ITC TradeMap Database and author's calculations

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Annex

South African trade, 2009 and 2010, rand (million) – ranked by total trade

	Country/year	Exports		Imports		Totals	
		2009	2010	2009	2010	2009	2010
	World	511 607	587 291	542 090	581 006	1 053 698	1 168 298
1	Unidentified	52 871	62 237	70 818	80 872	123 690	143 110
2	China	47 722	59 326	63 244	66 114	110 966	125 440
3	USA	41 468	51 691	41 544	41 903	83 012	93 594
4	Japan	34 475	46 871	26 312	31 019	60 787	77 890
5	Germany	31 465	42 673	27 251	23 695	58 716	66 368
6	UK	25 265	26 991	22 109	23 004	47 375	49 995
7	India	17 402	21 742	21 432	21 979	38 834	43 721
8	Switzerland	21 506	17 750	15 408	20 549	36 914	38 299
9	Netherlands	17 508	16 951	16 932	17 034	34 440	33 984
10	Zimbabwe	13 533	15 698	15 642	16 080	29 175	31 778
11	Mozambique	13 522	13 782	13 678	14 644	27 200	28 426
12	Belgium	10 791	13 139	11 659	14 602	22 450	27 741
13	Zambia	11 917	12 747	11 504	13 322	23 420	26 068
14	Korea, South	7 582	12 500	9 656	12 763	17 237	25 264
15	Italy	9 094	10 397	9 839	10 323	18 934	20 721
16	Spain	9 161	8 044	9 393	10 256	18 554	18 301
17	Taiwan	6 920	7 739	10 565	9 890	17 485	17 629
18	Hong Kong	8 110	7 050	9 194	9 604	17 304	16 654
19	Australia	6 105	6 930	6 436	9 186	12 541	16 116
20	France	6 279	6 318	7 362	8 506	13 641	14 824
26	Brazil	2 993	5 230	4 893	6 359	7 887	11 588
42	Russia	1 502	2 073	2 944	1 967	4 446	4 040

Source: WTA
