

# EQuIP

## Enhancing the Quality of Industrial Policies



## TOOL 2

### Sub-sector Competitive Performance

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

EQuIP Tool 2:

Sub-sector Competitive  
Performance



# Summary Sheet

Enhancing the Quality of Industrial Policies (EQUIP) – Tool 2	
<b>Name of the tool:</b>	Sub-sector Competitive Performance
<b>Objective:</b>	<p>This tool aims at measuring the competitiveness of any given sub-sector within manufacturing in a multifaceted manner. The methodology is in line with that of Tool 1 on Industrial Capacity and Growth, and it helps to measure both the production and the export performance of any sub-sector using a number of indicators. Through the comparison of performance across sub-sectors, this tool helps identify sub-sectors that can contribute the most to overall industrial and export competitiveness and growth. This tool provides a methodology to analyse current performance and past developments of sub-sectors, while supporting the sub-sector selection exercise in the strategy-setting phase of the industrial policy cycle.</p>
<b>Key questions addressed:</b>	<p>To what extent is a country able to produce and export products of a particular sub-sector? How is that country's performance in different sub-sectors compared to main competitors and role models? And how has the capacity to produce and export changed over time in individual sub-sectors?</p> <p>What role does a country have as a global (or regional) player in a specific sub-sector, and how has its world (or regional) market share changed over the years?</p> <p>How much does a particular sub-sector contribute to the manufacturing industry of the country?</p>
<b>Indicators used:</b>	<p>Sub-sector value added per capita  Sub-sector exports per capita  Share in world value added of sub-sector  Share in world exports of sub-sector  Share of sub-sector in total manufacturing value added (MVA)  Share of sub-sector in manufactured exports</p>



# Contents

1. Introduction	1
2. Methodology and Analytical Steps	3
2.1 Defining a sub-sector	3
2.2 Indicators for analysis	4
2.3 The capacity dimension	5
2.3 The impact dimension	6
2.3 The structure dimension	7
3. Interpretation of Findings	9
3.1 The capacity dimension	9
3.2 The impact dimension	10
3.3 The structure dimension	12
3.4 Competitiveness scorecards	13
3.5 Cross-sub-sector analysis: Comparing manufacturing sub-sectors within one economy	15
4. Possible Extensions	17
5. Link to other Areas	18
6. Possible Data Sources	19
7. References and further readings	20
8. Annexes	21

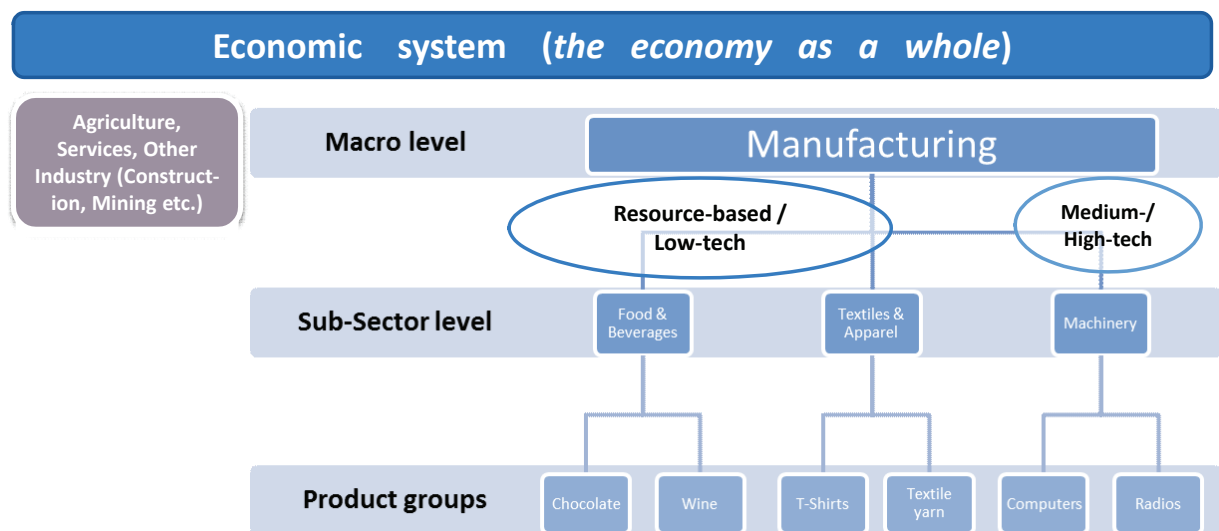




# 1. Introduction

The manufacturing sector is composed of different sub-sectors. Tool 1 on “industrial capacity and growth – domestic and export dimensions” presents a diagnostic methodology that takes the manufacturing sector as a whole as its unit of analysis. Thus, Tool 1 outlines a methodology for a macro-level analysis. Diagram 1 illustrates the different layers of the economic system and thereby points to the different possible units of analysis for an industrial diagnosis. It is important to recognise that different sub-sectors typically operate under different circumstances, requiring different capabilities and inputs in terms of technology, skills etc. In this way, different sub-sectors contribute to overall industrial development in various ways. Some sub-sectors have a larger impact in terms of exports while others cater more to domestic consumption while still others contribute more to increasing the level of technological sophistication. A macro-level analysis masks such differences. This tool aims to account for these differences.

**Diagram 1: Different layers of the economic system**



This tool aims at measuring the competitiveness of any given sub-sector within manufacturing using a multi-layered approach. To do so coherently, we align the analysis developed in this tool to the macro (manufacturing) level analysis presented in Tool 1. This sub-sector level methodology therefore breaks down the indicators used to measure performance of the manufacturing sector as a whole to allow for an assessment of any given sub-sector within manufacturing. Such a methodology addresses two **main goals**:

- It allows us to investigate and benchmark the international competitiveness of a specific sub-sector;
- It allows us to reveal how the manufacturing sub-sector of any economy is constructed. By looking at all sub-sectors of manufacturing, rather than focusing on one or two, we can better understand which sub-sectors contribute to industrial competitiveness, in which way they do so, and determine at which stage of the industrial development trajectory the country is.

The methodology is therefore valuable for various exercises at different stages of the policy-making process. Commonly, it is used at the diagnosis phase at the starting point of the cycle, in a similar way the macro-level analysis (Tool 1) is used. In addition, the sub-sector level assessment of competitiveness also lends itself very well to the strategy-setting stage, as it can assist the analyst in the selection of sub-sectors to suggest for industrial policy intervention – depending on the

sub-sector's performance and its contribution to overall industrial competitiveness of the country. Furthermore, the methodology allows the generation of information that can be useful for policy design in that it indicates, for example, where the strengths and weaknesses of each sub-sector lie regarding its competitiveness. Finally, this sub-sector-level performance assessment is useful for monitoring and evaluation (M&E) purposes. As the analysis is based on internationally comparable, non-perception based data, the presentation of the indicators in terms of "scorecards" visualizes individual sub-sector's performance in an easy-to-read manner.

While this tool focuses on the sub-sectors within manufacturing<sup>1</sup>, a box in Section 3 below demonstrates how the methodology in this tool can be easily replicated for a sub-sector of the service sector or any other sub-sector.

### Justification of Sub-sector Level Competitiveness Analysis

Carrying out a competitiveness analysis at the macro level inherently hides certain information of what is happening *within* the manufacturing sector. In particular, the following questions can be answered only with a sub-sector-level assessment:

- To which extent is a country able to produce and export products of a particular sub-sector, and how is the different sub-sectors' performance compared to that of main competitors and role model countries?
- How has the different sub-sectors' capacity to produce and export changed over time?
- How important is the country as a global player in a specific sub-sector, and how has its world market share changed over time?
- How much does a particular sub-sector contribute to the manufacturing industry of the country?

Furthermore, analysing sub-sector performance and competitiveness trends over time provides insight into the composition of industry and structural change processes. By conducting sub-sector competitiveness analyses within the macro level context, it is possible to pinpoint to what extent the different sub-sectors have been contributing to economic performance at the macro level. Additional questions can be explored, such as: What is the country best at producing and exporting? What sub-sectors have been growing the fastest? Which sub-sectors have been slow or unable to develop?

Sub-sector analysis is particularly insightful because sub-sectors operate under very different circumstances from each other. They operate in distinct global value chains, of which each one is governed uniquely. The individual sub-sectors and the different activities undertaken in these sub-sectors will require varied technologies, skillsets, financing, and support systems.

Moreover, each sub-sector contributes to overall industrial development and competitiveness in distinct ways. While some will have a larger impact in terms of exports, others cater more for domestic consumption. Similarly, some may contribute more to increasing the level of technological sophistication and have greater positive spillovers in terms of innovation and skills development. Furthermore, while some sub-sectors may constitute a large share of the manufacturing sector at present, other sub-sectors may be growing at significant rates, augmenting their importance for the country's economy in the future. This tool presents a methodology that enables the analyst to observe such differences. Being in a position to carry out such a sub-sector competitiveness analysis will indicate where further analysis and possible intervention would be most beneficial. The individual sub-sectors will also have differing socio-economic impacts, some of which can be analysed through the "industrial employment and poverty alleviation" tool and the "greening industry" tool (see Tools 5 and 6) of this toolbox.

---

<sup>1</sup> Please see Tool 1 for the rationale behind EQUiP's focus on the manufacturing sector.

## 2. Methodology and Analytical Steps

### 2.1 Defining a Sub-sector

The first step is to define manufacturing sub-sectors. There are different strategies to determine what products belong to which sub-sector and into how many sub-sectors the manufacturing sector should be divided. The clustering of product groups into sub-sectors is important to pave way for a meaningful analysis of a given economy at a more disaggregated and detailed level. The degree of disaggregation of manufacturing activities into sub-sectors that the analyst chooses will depend on the purpose or intention of the analysis, on data availability, and on the time available to the analyst.

Table 1 presents one example of how to disaggregate the manufacturing sector into sub-sectors, broadly based on production processes and levels of technological sophistication. The table illustrates the corresponding ISIC rev. 3 and SITC rev. 3 classifications<sup>2</sup> and assigns each sub-sector one of three technology classifications: RB = Resource Based, LT = Low technology, and MHT = Medium and high technology.

**Table 1: Sub-sector classifications and codes: example**

	Manufacturing Sub-sector	Sub-sector Tech. Class	ISIC (rev 3) codes	SITC (rev 3) codes
1	<b>Food, Beverages and Tobacco</b>	RB	15, 16	016, 017 023, 024, 035, 037, 046, 047, 048, 056, 058, 059, 061, 062, 073, 091, 098, 111, 112, 122, 411, 421, 422, 431
2	<b>Textiles, wearing apparel and leather products</b>	RB	17, 18, 19	264, 265, 266 (MT), 267(MT), 611-13, 651-9, 653(MT), 831, 841-8, 851
3	<b>Wood and Paper products</b>	RB	20, 21	247, 248, 633-5, 641, 642, 251
4	<b>Metal products</b>	LT	27, 28	281-9, 673-7, 679, 671 (MT), 672 (MT), 678 (MT), 689, 691-9
5	<b>Coke, refined petroleum, non-metallic mineral products and rubber</b>	LT	23, 2510, 26	232, 322, 334, 335, 621, 625, 629, 661-7, 342, 344, 345
6	<b>Machinery, equipment and telecommunications</b>	MHT	29, 30, 31, 32, 33	711- 4, 716, 718, 721-8, 731, 733, 735, 737, 741-9, 751-2, 759, 761-4, 771-6, 778, 871-4, 881-5
7	<b>Transport equipment</b>	MHT	34, 35	781-6, 791-3
8	<b>Chemical and plastic products</b>	MHT	24, 2520	512, 513, 525, 533, 511(RB), 514-6(RB), 522-4(RB), 531-2(RB), 541, 542, 551(RB), 553, 554, 562, 571- 5, 579, 581-3, 591, 592(RB), 593, 597, 598, 893 (LT)
9	<b>N.E.S. (incl. furniture, recycling and publishing and printing )</b>		36, 37, 22	811, 812, 813, 899, 894-8, 821, 891

<sup>2</sup> ISIC is the acronym for International Standard Industrial Classification of All Economic Activities, which is a system for classifying economic data. Similarly, SITC stands for Standard International Trade Classification and refers to an internationally standardised system of names and numbers to categorise and classify traded products. These categorisation schemes are revised from time to time in order to reflect changes in the product range available. Here we suggest using Revision 3 (rev. 3) of both data classification schemes.

**Note:** RB = Resource Based, LT = Low technology, MHT = Medium and high technology. Although at the 2-digit level of disaggregation sub-sectors are considered to be of a certain level of technological sophistication, specific product groups within a given sub-sector (which are captured at the 3-digit level of disaggregation) may indeed have a differing level of sophistication. When this is the case, the level of technological sophistication is indicated in brackets.

The analyst may carry out a sub-sector competitive performance analysis for all sub-sectors within manufacturing to obtain a holistic picture and allow for comparisons. Alternatively, the analyst can decide to carry out the assessment on one or several sub-sectors, depending on the objective of the analysis. The selection of sub-sectors for the exercise will depend on national priorities.

## 2.2 Indicators for Analysis

In the same way the capacity and growth analysis is undertaken for the overall manufacturing level (see Tool 1), the sub-sector level analysis aims to observe both the production and trade performance of sub-sectors since this is information that complements one another.

### Production data:

1. Reveals actual production (value added) taking place within national borders and;
2. also includes production of goods, which are consumed domestically.

### Trade/Export data:

1. Gives an indication of the competitiveness of the particular sub-sector when exposed to the international market and competition;
2. Therefore, it ensures that sub-sectors which are not fully exposed to international competition are not overestimated (which would be the case if only production data was considered);
3. However, this data does not allow the analyst to identify to what extent the production of the country's export goods actually took place within national borders (which is why production data is also necessary).

Table 2 illustrates the indicators at sub-sector level, which are based on the macro indicators described in the industrial capacity and growth tool (i.e. Tool 1).

**Table 2: The competitive performance indicators for sub-sectors**

Dimension	Industry Indicators	Trade Indicators
Capacity	Sub-sector value added per capita	Sub-sector exports per capita
Impact	Share in sub-sector's world value added	Share in sub-sector's world exports
Structural Change	Share of sub-sector's value added in total manufacturing value added (MVA)	Share of sub-sector's exports in total manufacturing exports

The capacity indicator measures the ability of a country to produce or export proportional to its population size. This allows us to compare large and small countries with each other and will indicate how much – in theory – one person in the country can produce/export of that sub-sector. By nature, this will favour countries with a smaller population.

The impact dimension reveals the share that a country has in terms of the world's production or export of that sub-sector. It is the only dimension that is relative by nature, taking the performance of the rest of the world (or region) into account. As larger countries are more likely to do better in this indicator, it somewhat balances out the bias in the capacity indicator discussed previously.

Structural Change illustrates the importance of any sub-sector to the overall manufacturing on both the production and export side. In other words, it illustrates the composition of the manufacturing sector.

As competitiveness in itself is a multifaceted concept, the combined analysis of these indicators is necessary to obtain a holistic picture of the competitive performance of each sub-sector. The remaining description of the tool aims to illustrate this.

In order to obtain a sense of competitiveness in relative terms, an important part of the exercise is to benchmark the economy or economies of interest to those of other countries. These countries could be competitors (either current or likely future competitors), role models, neighbouring countries or other countries with similar characteristics.

As illustrated above, sub-sector competitiveness performance is analysed using a set of dimensions – capacity, impact, structure – for the country's production and trade in a particular sub-sector. It is the composite of these indicators that provides holistic understanding of sub-sector competitiveness. An explanation of the calculation and interpretation of the indicators is described below.

## 2.3 The Capacity Dimension

Tracking sub-sector value added or export data is beneficial to understand levels, observe trends, and get a better understanding of how the country is doing in specific sub-sectors, particularly when compared to other countries. However, in order to evaluate the ability (i.e. capacity) of a country to produce and export the products of a sub-sector, it would be misleading to observe these figures as they stand, because country size, or population, do matter. To say, for example, that China is more capable of producing T-Shirts than Thailand, as China simply has more manpower to do so (Thailand's population is less than 5% of China's), would give the wrong message.

### 2.3.1 Sub-sector Value Added per Capita

Table 3 below illustrates the variables required and the data sources from which this data can be retrieved for a large number of countries.

**Table 3: Data and sources for computing industrial capacity**

Indicator	Variable	Source
Sub-sector Industrial Capacity	Value added, by sub-sector and country	UNIDO's Industrial Statistics Databases (INDSTAT)
	Population, total	World Development Indicators (WDI) Databank

A table similar to Table 4 can be generated for the countries and years of interest.

**Table 4: Illustration of presentation of data: sub-sector value added per capita**

Sub-sector Value Added per Capita						
	Sub-sector value added			Sub-sector value added per capita		
Country	2000	2005	2010	2000	2005	2010
South Africa						
India						
Brazil						

### 2.3.2 Sub-sector Exports per Capita

We calculate sub-sector exports per capita in order to understand a country's export capacity for a particular group of products. The data required and possible data sources are presented in Table 5.

**Table 5: Data and sources for computing sub-sector export capacity**

Indicator	Variable	Source
Sub-sector Export Capacity	Export values, by sub-sector and country	UNCOMTRADE
	Population, total	WDI

**Note:** UNCOMTRADE data is provided in current prices.

## 2.4 The Impact Dimension

The impact indicator at the sub-sector level measures the share of a country's contribution to world value added and exports for a given sub-sector. It puts the country's performance into perspective and is the only indicator in the competitiveness analysis that is relative.

### 2.4.1 Impact in World Value Added of the Sub-sector

To calculate this indicator, different databases, such as those mentioned in Table 6, will need to be used. While the figures for *sub-sector* level value added will be the same as the ones used for the capacity indicator, the data for *world* value added by sub-sector is taken from the table provided in Annex 1, created by UNIDO for the purpose of this exercise.

**Table 6: Data and sources for computing the impact of a country's sub-sector value added**

Indicator	Variable	Source
Impact in world value added of sub-sector	Value added, by sub-sector and country	UNIDO's Industrial Statistics Databases (INDSTAT)
	World Value added, by sub-sector	Table provided by UNIDO (UNIDO Statistics, WDI), see annexes 1 and 2

Once the shares in world value added per sub-sector are calculated, they can be presented in a table or a graph as illustrated below:

**Table 7: Illustration of presentation of data: share in world value added of sub-sector**

Share in world value added of sub-sector					
	Share in World Sub-sector Value Added			Change in Share (percentage points)	
Country	2000	2005	2010	2000-2010	2005-2010
South Africa					
India					
Brazil					

### 2.4.2 Impact in World Exports of the Sub-sector

A country's share of world exports within a particular sub-sector is also known as the world market share. Table 8 illustrates the data required to calculate this indicator.

**Table 8: Data and sources for computing the impact of a country's sub-sector value added**

Indicator	Variable	Source
Impact in sub-sector's world trade	Export values, by sub-sector and country	UNCOMTRADE
	World Export values, by sub-sector	UNCOMTRADE

## 2.5 The Structure Dimension

For this indicator we look at the relative importance a particular sub-sector has in total national manufacturing, i.e. its contribution to manufacturing value added and manufactured exports. Analysing all sub-sectors will help us understand intra-industry structural change, i.e. the composition and shifts in the composition of the manufacturing sector.

### 2.5.1 The Structure of MVA

To measure the structure of MVA, we utilise the data presented in Table 9.

Table 9: Data and sources for computing a sub-sector’s contribution to manufacturing value added

Indicator	Variable	Source
Structure of Industry	Value added, by sub-sector and country	UNIDO’s Industrial Statistics Databases (INDSTAT)
	Manufacturing Value Added (total, by country)	UNIDO’s Industrial Statistics Databases (INDSTAT)

2.5.2 The Structure of Manufactured Exports

Here we divide each sub-sector’s exports by total manufactured exports. Data can be taken from UNCOMTRADE (see Table 10).

Table 10: Data and sources for computing a sub-sector’s contribution to manufacturing exports

Indicator	Variable	Source
Structure of Manufactured exports	Export values, by sub-sector and country	UNCOMTRADE
	Total manufactured exports by country	UNCOMTRADE



### 3. Interpretation of Findings

This section will analyse the competitive performance of the food, beverages and tobacco sub-sector in South Africa. It will compare its performance to that of role model and competitor countries.

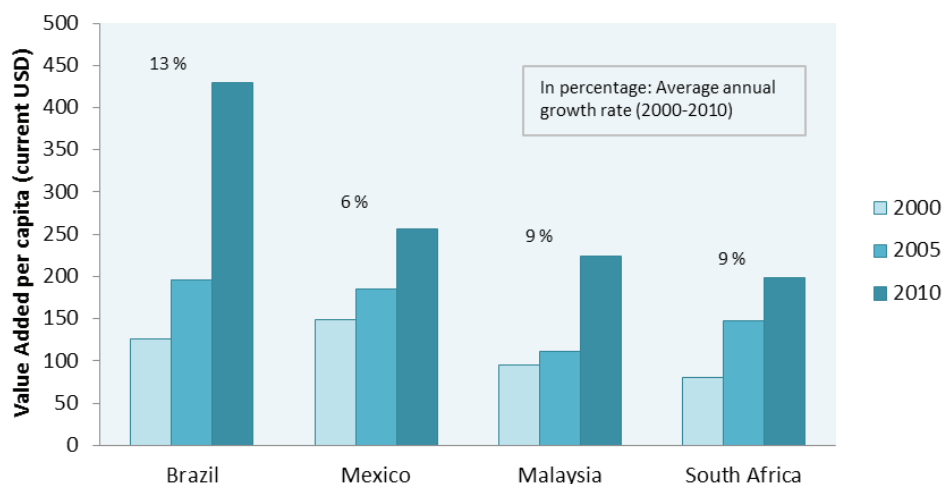
#### 3.1 The Capacity Dimension

##### Sub-sector Value Added per Capita

Figure 1 illustrates South Africa's capacity to produce food, beverages and tobacco and compares this to Brazil's, Mexico's and Malaysia's capacity. South Africa had a value added per capita of almost US\$ 200 in 2010, which is lower than that of the other countries in the sample, but close to the industrial capacity of Malaysia. We also see that South Africa has been improving this capacity over the ten-year period analysed, growing quite steadily at an average annual growth rate of 9%. Only Brazil surpassed this rate in our sample. However, during the last five years presented in our study, South Africa's production capacity in the food, beverages and tobacco sub-sector has seen a slower growth than during the first five years, while the other countries in the sample were able to increase their growth rates especially in these years.

**Figure 1: Production capacity at a sub-sector level: The food, beverage and tobacco sub-sector**

#### **(1) Food, Bev & Tobacco Value Added per capita (current USD)**



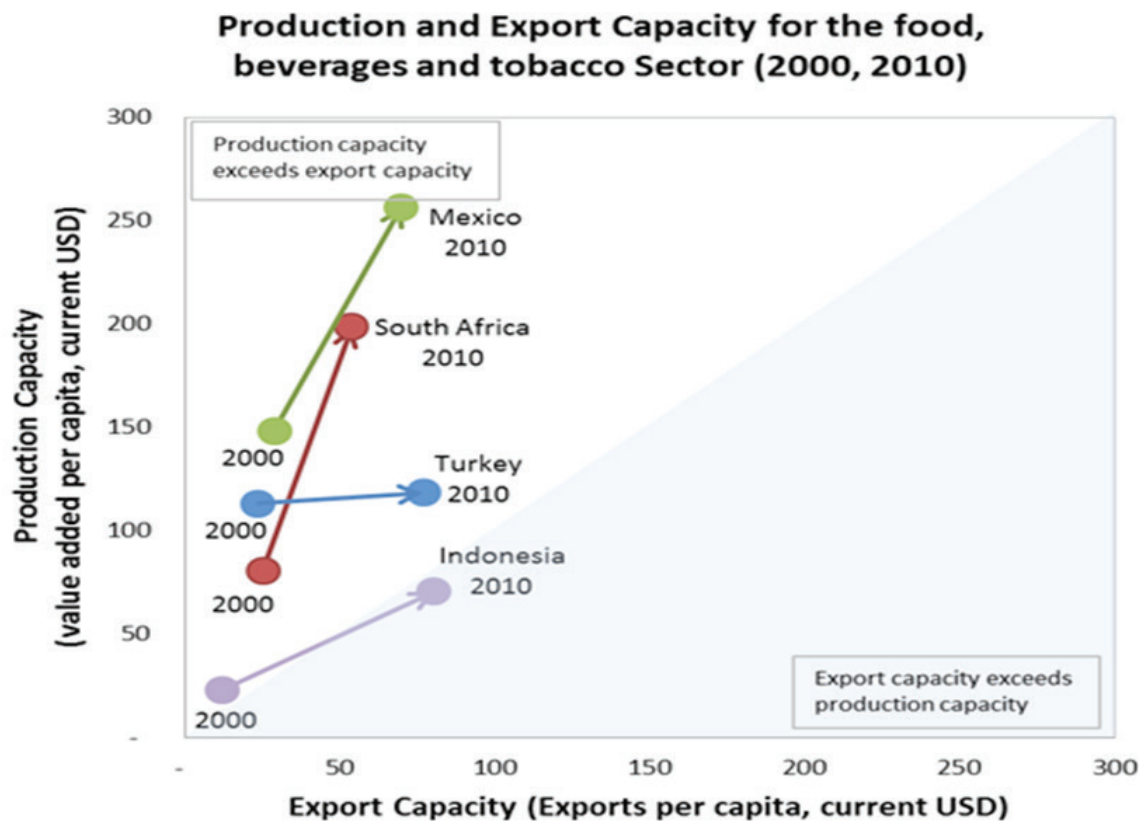
**Source: UNIDO INDSTAT database**

**Note: Average annual growth rate was calculated as Compound Annual Growth Rate.**

##### Sub-sector Exports per Capita

In addition to creating a simple bar chart and interpreting the levels and trends observed (as was done for value added per capita), it is illuminating to compare the capacity of a country to export to that of its capacity to produce for a given sub-sector. Figure 2 is an illustration of this.

Figure 2: Production versus export indicators at sub-sector level: The food, beverage and tobacco sub-sector



Source: UNIDO INDSTAT database and UNCOMTRADE

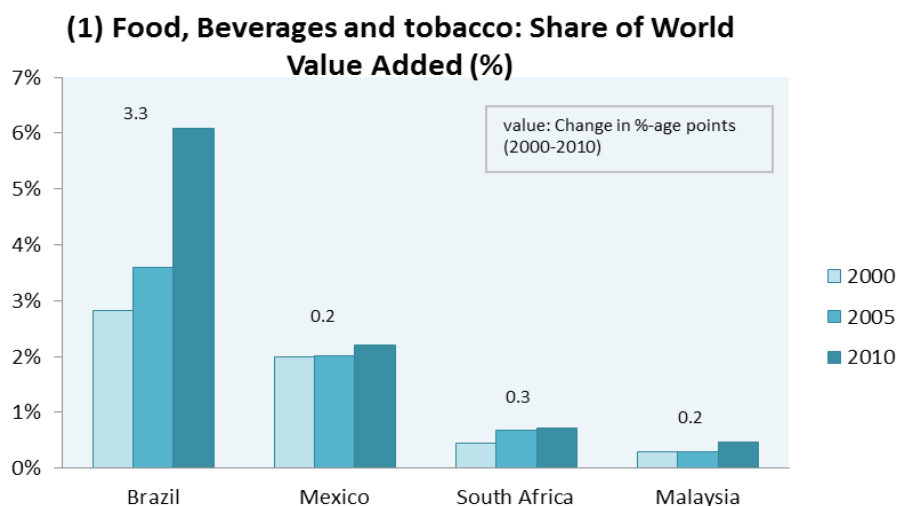
In the two graphs above, countries are located with regard to their capacity to export and add value for the food, beverages and tobacco sub-sector. If positioned in the top-left half of the graph (white area), the country's production capacity exceeds its export capacity. If a country lies underneath the line, in the bottom-right part, the inverse is true. For the food, beverages and tobacco sub-sector, it is clear that most countries of the sample were able to produce more than export, with the exception of Indonesia in 2010. This means that domestic consumption is important in this sector. In general, however, both Turkey and Indonesia had more balanced capacities to produce and export in 2010 than the others. South Africa and Mexico are more capable of producing food, beverages and tobacco than the former two countries, although their capacity to export has not matched these levels. Such graphs comparing export and production values can be done for any of the indicators and they will be of high value when beginning to think of possible strategies.

### 3.2 The Impact Dimension

#### Impact in World Value Added of the Sub-sector

Once the shares in world value added per sub-sector are calculated, they can be presented in a graph as shown below.

Figure 3: Impact of production at a sub-sector level: The food, beverage and tobacco sub-sector



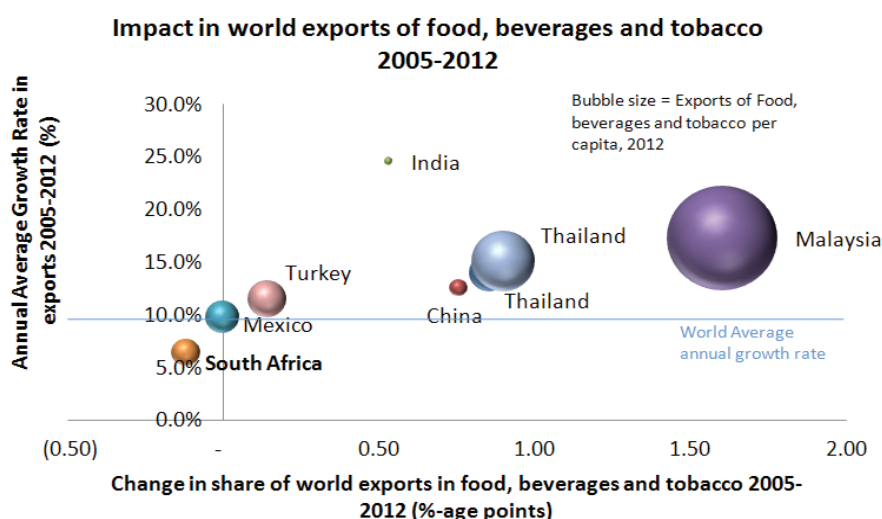
Source: UNIDO INDSTAT database

When compared to the other countries in the sample, South Africa did not have an impressive share in world value added. Similarly, this share did not particularly increase between 2000 and 2010 either. Brazil, in contrast, did exceptionally well in both terms.

#### Impact in World Exports of the Sub-sector

In addition to presenting a bar chart as the one in Figure 7, the information that has been collected until now can be used to create a bubble chart as seen below in Figure 4.

Figure 4: Observing trends in the impact of exports at a sub-sector level: The food, beverage and tobacco sub-sector (2005-2012)



Source: UNCOMTRADE

On the y-axis the annual average growth rate of the sub-sector's exports is illustrated, while on the x-axis the change in world market share for a food, beverages and tobacco sub-sector is plotted. This reveals that increasing exports per year alone does not imply that the country is doing well in

the sub-sector compared to other countries (or the world on average). It will need to grow at a rate exceeding the world average in order for the country to experience an increase in the share of world exports of that sub-sector. Furthermore, the bubble sizes represent the export values for the most recent year, in this case 2012. A country with a larger export value will find it easier to increase its market share. Note that countries with negligible world market shares may find it more relevant to make this analysis observing its share within a certain region (e.g. Sub-Saharan Africa) rather than for the whole world.

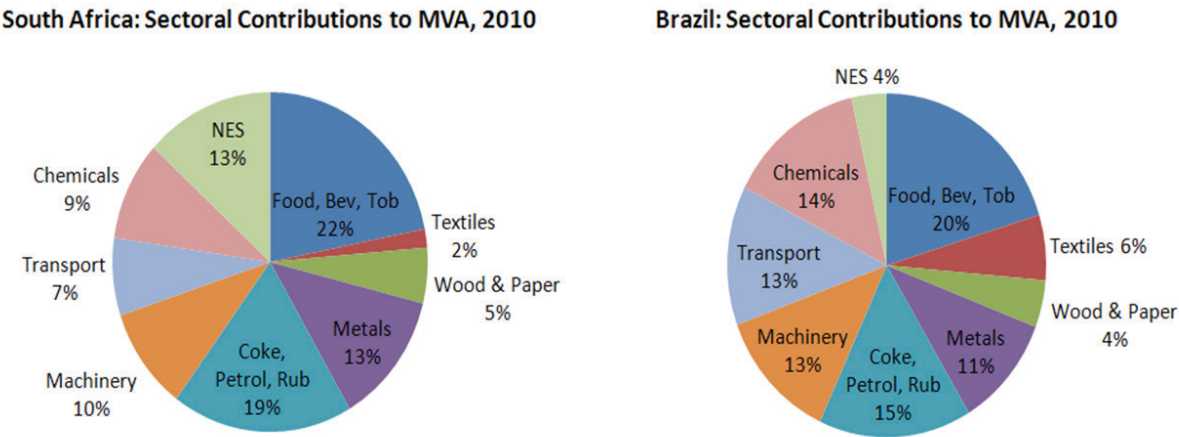
This figure also shows that South Africa has not managed to keep up with the average growth rates of the world for the food, beverages and tobacco sub-sector, despite having grown at roughly 6% on average per annum. This is why it has lost world market shares overall. The majority of the other countries in the sample have managed to grow faster in this sub-sector and have therefore managed to increase their share in the world market.

### 3.3 The Structure Dimension

#### The Structure of MVA

Various graphs can be generated to present the structure of value added. One straight-forward type would be a pie chart. Because such pie charts illustrate the composition of MVA for one country and one year only, we can present different pie charts, either presenting different points in time, or different countries, as done in figure 5 for South Africa and Brazil.

**Figure 5: Pie charts presenting sub-sector contributions to MVA**



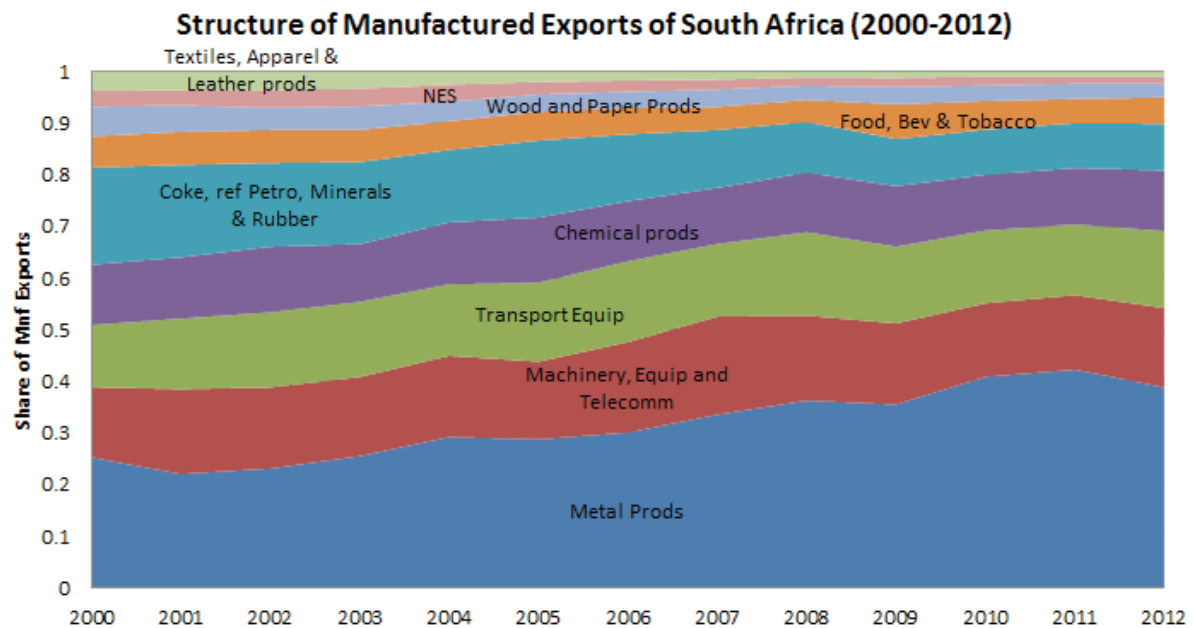
**Source: UNIDO INDSTAT database**

From figure 5 it can be observed that South Africa and Brazil have a similar production structure, though Brazil has a somewhat larger share of those sub-sectors considered medium and high-tech (e.g. machinery, transport and chemicals). South Africa's main contributing sub-sector to manufacturing value added is food, beverages and tobacco, followed by coke, refined petroleum, and rubber.

#### The Structure of Manufactured Exports

Figure 6 is a stacked line graph, which allows to observe changes in the structure of manufactured exports over time.

Figure 6: Structure of manufactured exports of South Africa (2000-2012)



Source: UNCOMTRADE

Particularly if there is a certain interest in (a) specific sub-sector(s), the graph above can be very useful. It is easy to read if there has been an increasing importance in that particular sub-sector within total manufactured exports. If, for example, the idea is shared that there should be a focus on sub-sectors that are generally considered to be more technologically sophisticated sub-sectors, then it is interesting to observe the sub-sectors of chemical products, transport equipment and machinery, equipment and telecommunications together. Taking the example of South Africa in Figure 6 above, the share of the three sub-sectors mentioned has increased by almost five percentage points between 2000 and 2012. Apart from the metals sub-sector, all sub-sectors which are not considered medium and high tech have decreased their shares.

An analyst could also compare the structure dimension of production to that of exports. Figure 2 gives evidence that the food, beverages and tobacco sub-sector is significantly more important to South Africa in terms of production than in terms of exports, whereas for metals the opposite is true.

### 3.4 Competitiveness Scorecards

Once all the indicators are calculated the information can be summarised using a scorecard. This can be done for each sub-sector individually for any country. An example for the food, beverages and tobacco sub-sector is presented below (Figure 7). Having one scorecard per sub-sector allows us to easily monitor performance of the particular sub-sector of interest over time. Furthermore, scorecards for different sub-sectors can be compared with one another for cross-sub-sector comparisons.

Figure 7: Sub-sector level scorecard: The food, beverage and tobacco sub-sector

SCORECARD: (1) Food, Beverages and Tobacco								
Dimensions	Industry Indicators (MVA)				Trade Indicators (Exports)			
	2000	2005	2010	2000-2010	2000	2005	2012	2000-2012
Capacity (USD)	80.61	147.94	198.64	↑	25.25	38.31	54.5	↑
Impact (%)	0.46	0.69	0.72	↑	0.63	0.61	0.49	↓
Structural Change (%)	15.5	17.1	21.9	↑	6.05	5.57	5.11	↓
Industrial Deepening (%)					43.1	51.5	53.3	↑

Source: UNIDO INDSTAT database and UNCOMTRADE

From the analysis presented above and by looking at this scorecard, certain conclusions about the competitiveness of South Africa's food, beverages and tobacco sub-sector can be made. Firstly, the country is significantly more capable of producing food, beverages and tobacco than exporting them. There may be various reasons for this, for example that the quality of the goods is not competitive internationally, that trade restrictions make this difficult, or simply that domestic consumption is high. This is a sub-sector that very commonly has a higher value in production than in exports. Nonetheless, the capacity of South Africa has increased on both aspects. Secondly, South Africa's share in both world production and world exports of food, beverages and tobacco is below 1%. Additionally, it has lost world export market shares, meaning other countries have increased their exports faster than South Africa. Finally, while the food, beverages and tobacco sub-sector has played an increasing role in MVA for South Africa since 2000, its importance for exports has decreased from an already small starting point. This, as already mentioned, is not necessarily something negative, if the country has reasons for wanting other sub-sectors to gain more importance.

**Box 1: Sub-sector competitive performance analysis for other sectors**

While this tool has focused on an analysis of sub-sectors within the manufacturing sector as a whole, it is also possible to use this tool for sub-sectors of other sectors, such as the service sector. Below is an example of a scorecard for the transport sub-sector within the service sector for South Africa. Note that the denominator of the structure indicator is no longer MVA for the industry side, but rather value added of services. Data will need to be obtained from different sources. Indications of where the data was collected for the transport sector are made below the scorecard.

South Africa						
SCORECARD: Transport Service Sub-sector						
Dimensions	Industry Indicators (Value Added)			Trade Indicators (Exports)		
	2000	2012	2000-2012	2000	2012	2000-2012
Capacity (USD)	265	600	↑	27	33	↑
Impact (%)	0.47%	0.62%	↑	0.34%	0.19%	↓
Structure (% of Services)	14.90%	13.20%	↓	23.44%	11.43%	↓
Note: Value Added data: Transport includes storage and communication (ISIC I)						
Data sources: UN National Accounts, WDI, UNCTAD						

### 3.5 Cross-sub-sector Analysis: Comparing Manufacturing Sub-sectors within One Economy

In addition to comparing the competitiveness of a sub-sector of one country to that of other countries, comparing the performance of the different manufacturing sub-sectors within a country to one another reveals additional information that can be important for various stages of the policy cycle.

To give an example of such a cross-sub-sectoral analysis, one interesting question that can be addressed is: *What is the competitive potential of each sub-sector for the country?*

While there is a variety of ways to assess the competitive potential of a sub-sector, we can work with export data to obtain a simplistic understanding of the trends in world demand for products of a particular sub-sector on the one hand, and the changes in world market share of a country on the other hand (see Figure 8). Drawing a horizontal line of world average annual growth rates for all manufactured products allows us to classify sub-sectors into four quadrants:

**Champions:** Sub-sectors where world demand has been growing at above average rates and where the country is succeeding in gaining world market shares.

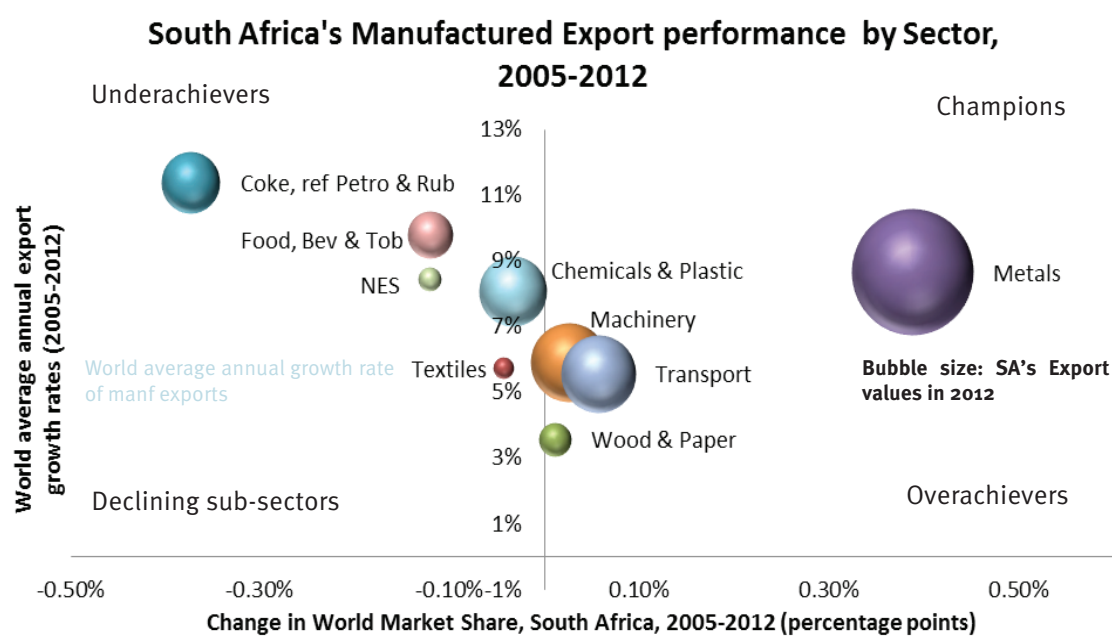
**Underachievers:** Sub-sectors where world demand has been growing at above average rates, but where the country has had a decrease in world market share throughout the years.

**Overachievers:** Sub-sectors where the country has been gaining world market share, but where the world demand has been growing slower than average.

**Declining sub-sectors:** Sub-sectors where the demand has been growing slower than average and the country has been losing world market share.

From Figure 8 below it is clear that only the metals sub-sector is considered to be a champion, as world demand throughout the observed period has increased at an above average rate and South Africa has been able to capture a larger share of the market. South Africa was also able to increase its share in world market in sub-sectors that have been growing in terms of world demand, though lower than the average of manufactured exports. There seem to be some missed opportunities, such as in the coke, refined petroleum and rubber sub-sectors, which had the largest increase in world demand. Meanwhile, South Africa's food, beverages and tobacco sub-sector is considered an underachiever according to this graph: While world demand in this subsector has been growing above average, South Africa is losing world market share (which is something we have seen earlier in Figure 7). Whether South Africa would like to attempt to improve its position in the world market is a strategic question it will have to reflect upon.

Figure 8: Competitiveness potential of different sub-sectors in South Africa (2005-2012)



Source: UNCOMTRADE



## 4. Possible Extensions

As for all other tools, there is room to improve and extend this sub-sector competitive performance tool. Significantly more analysis could be added to this tool. One could, for example, bring the **diversification of products analysis** (see Tool 4) down to the sub-sector level. This would illuminate how diversified the production and exports of that sub-sector are. There will be certain reasons in favour of diversification, while one can also argue for specialization towards carefully selected products. Similarly, one could do a **market diversification analysis** (see Tool 4) for any or each sub-sector. This will indeed be very insightful as one would get an understanding of the vulnerability in terms of export destinations of the country for any sub-sector. Having a solid understanding of the export partners is a first step when assessing how to tap into other markets for the products of any sub-sector.

## 5. Link to Other Areas

The sub-sector competitive performance tool is closely linked to a number of the other tools within the toolkit. On the one hand, it is based on the industrial capacity and growth tool (Tool 1), which is used to measure the overall manufacturing competitiveness. However, it would be very important to link this sub-sector competitive performance analysis to the “industrial employment and poverty alleviation” tool and the “greening industry” tool (see Tools 5 and 6), in order to bring social aspects into the analysis. It is important to understand the roles of different sub-sectors in terms of these two dimensions in addition to their competitiveness and how these different dimensions interact. For example, some sub-sectors will be more beneficial to generate economic growth, while others are able to create more employment. Similarly, some will be more energy efficient and have less of a detrimental impact on the environment than others.

## 6. Possible Data Sources

UNIDO Industrial Statistics databases – INDSTAT2 and INDSTA4: CD-ROM and <http://stat.unido.org/>

UNCOMTRADE database <http://comtrade.un.org/>, which is also freely available through:

World Bank World Integrated Trade Solution (WITS):<https://wits.worldbank.org/>

National statistics

## 7. References and Further Readings

UNIDO (2012): *Tanzania Industrial Competitiveness Report 2012*. Vienna: United Nations Industrial Development Organization, Ministry of Industry and Trade of the United Republic of Tanzania, and President's Office Planning Commission of the United Republic of Tanzania (POPC).

UNIDO (2002): *Industrial Development Report 2002/2003: Competing Through Innovation and Learning*. Vienna, United Nations Industrial Development Organization

Lall, S. (2001): *Competitiveness, Technology and Skills*. Cheltenham, UK and Northampton, USA: Edward Elgar

## 8. Annexes

**Annex 1: World Value Added by Sub-sector (*UNIDO-defined Sub-sectors*)**

World Value Added per Sector (estimates, current USD)						
Sectors	ISIC (rev 3) codes	2000	2001	2002	2003	2004
1 Food, Beverages and Tobacco	15, 16	784,461,988,435	763,561,605,950	781,128,264,149	859,759,833,551	946,634,778,507
2 Textiles, wearing apparel and leather goods	17, 18, 19	342,990,503,676	315,103,027,262	307,851,947,766	327,044,645,573	354,214,609,214
3 Wood and Paper Products	20, 21	283,594,215,404	264,236,049,847	273,940,629,850	297,654,316,628	330,631,002,793
4 Metals	27, 28	736,373,290,883	692,621,147,073	704,659,311,187	784,755,597,550	902,322,981,909
5 Coke and Petroleum, Rubber, Glass and other	23, 26, 2510	520,854,520,046	495,413,943,741	510,177,643,388	565,165,455,749	632,093,867,059
6 Machinery, equipment and telecommunications	29, 30, 31, 32, 33	1,264,727,968,635	1,164,575,895,682	1,167,006,945,088	1,331,417,733,666	1,555,498,043,124
7 transport equipment	34, 35	578,534,782,167	557,331,249,224	580,821,468,322	647,392,289,449	731,789,412,277
8 Chemicals	24, 2520	829,724,984,900	798,033,456,306	843,142,491,695	940,307,584,751	1,062,465,669,383
9 NES	22, 36, 37	415,929,534,806	390,022,822,224	388,273,653,797	417,313,190,586	458,228,632,402
<b>Total MVA</b>		<b>5,757,191,788,952</b>	<b>5,440,899,197,309</b>	<b>5,557,002,355,243</b>	<b>6,170,810,647,505</b>	<b>6,973,878,996,667</b>

Annex 1 (cont.): World Value Added by Sub-sector (*UNIDO-defined Sub-sectors*)

World Value Added per Sector (estimates, current USD)							
Sectors	ISIC (rev 3) codes	2005	2006	2007	2008	2009	2010
1 Food, Beverages and Tobacco	15, 16	1,011,111,077,697	1,060,876,448,683	1,174,140,714,170	1,267,280,571,248	1,196,933,423,526	1,346,403,841,302
2 Textiles, wearing apparel and leather goods	17, 18, 19	361,576,377,082	381,309,710,520	421,819,565,004	448,891,276,037	411,477,143,072	463,843,110,775
3 Wood and Paper Products	20, 21	348,393,312,577	361,504,110,779	389,536,377,367	403,568,666,838	361,896,847,112	406,140,053,550
4 Metals	27, 28	957,105,084,239	1,048,221,632,289	1,192,719,372,817	1,301,445,842,733	1,166,717,070,726	1,336,229,322,358
5 Coke and Petroleum, Rubber, Glass and other	23, 26, 2510	668,678,051,059	702,521,621,778	767,296,084,053	820,551,238,355	735,641,572,608	829,004,126,736
6 Machinery, equipment and telecommunications	29, 30, 31, 32, 33	1,693,953,344,968	1,904,416,249,231	2,257,123,780,591	2,480,077,560,582	2,271,835,521,600	2,652,843,922,955
7 transport equipment	34, 35	782,184,669,969	833,800,825,606	936,201,823,538	977,368,571,892	882,895,394,431	1,035,905,997,163
8 Chemicals	24, 2520	1,129,096,340,983	1,201,997,168,053	1,335,373,139,832	1,404,451,231,537	1,306,518,511,418	1,484,338,163,093
9 NES	22, 36, 37	477,848,293,047	500,385,544,997	547,553,064,389	570,279,808,039	510,202,431,258	563,261,441,874
<b>Total MVA</b>		<b>7,429,946,551,621</b>	<b>7,995,033,311,936</b>	<b>9,021,763,921,762</b>	<b>9,673,914,767,260</b>	<b>8,844,117,915,749</b>	<b>10,117,969,979,806</b>

Annex 2: World Value Added by Sub-sector (according to the 2-digit-level branches of ISIC Rev. 3)

ISIC(Rev.3) - Branch	WORLD VALUE ADDED BY SUB-SECTOR (IN US\$) (estimated by UNIDO)		
	2000	2005	2011
15 - Food and beverages	696,620,206,463	928,743,318,953	1,274,864,217,455
16 - Tobacco products	80,600,685,045	89,159,358,619	101,179,699,798
17 - Textiles	166,958,561,880	178,318,717,239	182,123,459,636
18 - Wearing apparel, fur	132,415,411,146	118,879,144,826	131,533,609,737
19 - Leather, leather products and footwear	51,814,726,101	44,579,679,310	50,589,849,899
20 - Wood products (excl. furniture)	115,143,835,779	148,598,931,032	151,769,549,697
21 - Paper and paper products	166,958,561,880	208,038,503,445	252,949,249,495
22 - Printing and publishing	247,559,246,925	297,197,862,065	354,128,949,293
23 - Coke, refined petroleum products, nuclear fuel	213,016,096,191	289,767,915,513	364,246,919,273
24 - Chemicals and chemical products	621,776,713,207	869,303,746,540	1,173,684,517,657
25 - Rubber and plastics products	264,830,822,292	334,347,594,823	435,072,709,132
26 - Non-metallic mineral products	236,044,863,347	304,627,808,616	384,482,859,233
27 - Basic metals	305,131,164,814	401,217,113,788	505,898,498,990
28 - Fabricated metal products	431,789,384,171	520,096,258,613	677,903,988,647
29 - Machinery and equipment n.e.c.	518,147,261,006	661,265,243,094	920,735,268,162
30 - Office, accounting and computing machinery	74,843,493,256	89,159,358,619	151,769,549,697
31 - Electrical machinery and apparatus	230,287,671,558	282,337,968,962	414,836,769,172
32 - Radio, television and communication equipment	253,316,438,714	386,357,220,684	768,965,718,465
33 - Medical, precision and optical instruments	178,472,945,458	252,618,182,755	394,600,829,212
34 - Motor vehicles, trailers, semi-trailers	420,275,000,593	594,395,724,130	789,201,658,425
35 - Other transport equipment	155,444,178,302	208,038,503,445	333,893,009,334
36 + 37 - Furniture; manufacturing n.e.c. + Recycling	195,744,520,824	222,898,396,549	303,539,099,394
<b>TOTAL WORLD MVA</b>	<b>5,757,191,790,952</b>	<b>7,429,946,553,626</b>	<b>10,117,969,981,817</b>

Note: As there is a significant number of countries that do not report to UNIDO's INDSTAT database for each year or sub-sector, it is not reliable to use the sum of all countries' value added by sub-sector as a proxy for the world value added. Instead, UNIDO has specifically created a table with estimated figures of world value added by sub-sector for selected years using world MVA data from WDI and shares of world value added by sub-sectors.

For the impact indicator it is important to ensure that this denominator includes roughly the same countries each year, so that we do not identify large jumps from one year to the next, which would affect the share in an unjust manner. It is more important to observe trends over time and compare values and trends between countries than to ensure the share is precise. This is possible using the estimates reported in the table.

### Annex 3: UNIDO Classification for Sophistication of Product Groups within Subsectors

Sub-sector	Product Groups (with SITC rev. 3 codes)		Notes
	High value product groups	Low value product groups	
1 Food, Beverages and Tobacco			
	122 Tobacco, manufactured	58 Fruit presvd/fruit preps	(excl. 981, 985, 989)
	35 Fish, dried/salted/smoked	98 Edible products n.e.s.	
	37 Fish/shellfish, prep/pres	48 Cereal, etc., flour/starch	
	16 Meat/offal preserved	91 Margarine/shortening	
	24 Cheese and curd	56 Veg root/tuber, prep/pres	
	73 Chocolate/cocoa preps	59 Fruit/veg juices	
	17 Meat/offal presv'd n.e.s	421 Fixed veg oil/fat, soft	
	23 Butter and cheese	411 Animal oil/fat	
	62 Sugar confectionery	431 Animal/veg oils processed	
	112 Alcoholic beverages	422 Fixed veg oils not soft	
	981 Homogenised food preps.	61 Sugar/mollasses/honey	
	985 Soups and broths	47 Cereal meal/flour, n.e.s	
	989 Food preparations, n.e.s.	46 Flour/meal wheat/meslin	
	616 Natural honey	111 Beverage non-alcohol, nes	
2 Textiles, Wearing Apparel and Leather Products			
	613 Furskins tanned/dressed	655 Knit/crochet fabrics	(excl. 8511,2,4)
	845 Articles of apparel nes	658 Made-up textile articles	
	612 Leather manufactures	846 Clothing accessories	
	654 Woven textile fabric nes	831 Trunks and cases	
	656 Tulle/lace/embr/trim etc	851 Footwear	
	848 Headgear/non-text clothg	657 Special yarns/fabrics	
	653 Man-made woven fabrics	651 Textile yarn	



652	Cotton fabrics, woven	267	Man-made fibres nes/wast	
611	Leather	266	Synthetic spinning fibre	
8511	Footwear metal toe-cap	265	Veg text fibre ex cot/ju	
8514	Footwear leather upr nes	264	Jute/bast fibre raw/retd	
8512	Sports footwear	843	Men/boy wear knit/croch	
842	Women/girl clothing woven	844	Women/girl wear knit/cro	
841	Mens/boys wear, woven	659	Floor coverings etc.	
<b>3 Wood and Paper Products</b>				
633	Cork manufactures	635	Wood manufactures n.e.s.	(excl. 6352,4)
642	Cut paper/board/articles	248	Wood simply worked	
6352	Cooprage prod,inc staves	641	Paper/paperboard	
6354	Domestic/decor wood art.	634	Veneer/plywood/etc	
		251	Pulp and waste paper	
		247	Wood in rough/squared	
<b>4 Metal Products</b>				
695	Hand/machine tools	689	Misc non-ferr base metal	
696	Cutlery	699	Base metal manufac nes	
697	Base metal hhold equipms	694	Nails/screws/nuts/bolts	
692	Metal store/transpt cont	691	Iron/stl/alum structures	
678	Iron/steel wire	693	Wire prod exc ins electr	
671	Pig iron etc ferro alloy	679	Iron/steel pipe/tube/etc	
672	Primary/prods iron/steel	675	Flat rolled alloy steel	
		677	Iron/steel railway matl	
		674	Rolled plated m-steel	
		676	Iron/steel bars/rods/etc	
		673	Flat rolled iron/st prod	
<b>5 Coke, Refined Petroleum, Non-metallic Mineral</b>				
625	Rubber tyres/treads	345	Coal gas/water gas/etc	
629	Articles of rubber nes	663	Mineral manufactures nes	
621	Materials of rubber	344	Petrol./hydrocarbon gas	

666 Pottery  
 232 Rubber synth/waste/etc  
 664 Glass  
 665 Glassware

662 Clay/refractory material  
 334 Heavy petrol/bitum oils  
 342 Liquid propane/butane  
 335 Residual petrol. prods  
 661 Lime/cement/constr matl  
 322 Briquettes/lignite/peat  
 667 Pearls/precious stones

## 6 Machinery, Equipment and Telecommunications

716 Rotating electr plant  
 718 Power generating equ nes  
 751 Office machines  
 752 Computer equipment  
 759 Office equip parts/accs.  
 764 Telecomms equipment nes  
 771 Elect power transm equip  
 774 Medical etc el diag equi  
 776 Valves/transistors/etc  
 871 Optical instruments nes  
 874 Measure/control app nes  
 881 Photographic equipment

711 Steam generating boilers  
 712 Steam/vapour turbines  
 713 Internal combust engines  
 714 Engines non-electric nes  
 721 Agric machine ex tractr  
 722 Tractors  
 723 Civil engineering plant  
 724 Textile/leather machinry  
 725 Paper industry machinery  
 726 Printing industry machny  
 727 Food processing machines  
 728 Special indust machn nes  
 731 Mach-tools remove mtrial  
 733 Mtl m-tools w/o mtl-rmvl  
 735 Metal machine tool parts  
 737 Metalworking machine nes  
 741 Indust heat/cool equipmt  
 742 Pumps for liquids  
 743 Fans/filters/gas pumps  
 744 Mechanical handling equi  
 745 Non-electr machines nes  
 746 Ball/roller bearings

		747 Taps/ cocks/ valves	
		748 Mech transmission equmnt	
		749 Non-elec parts/ acc machn	
		761 Television receivers	
		762 Radio broadcast receiver	
		763 Sound/ tv recorders etc	
		772 Electric circuit equipmt	
		773 Electrical distrib equip	
		775 Domestic equipment	
		778 Electrical equipment nes	
		872 Medical/ etc instruments	
		873 Meters and counters nes	
		882 Photographic supplies	
		884 Optical fibres	
		885 Watches and clocks	
<b>7 Transport Equipment</b>			
	792 Aircraft/ spacecraft/ etc	791 Railway vehicles/ equipmt	(excl. subgroups under high soph)
	783 Road motor vehicles nes	793 Ships/ boats/ etc	
	782 Goods/ service vehicles	784 Motor veh parts/ access	
	781 Passenger cars etc	785 Motorcycles/ cycles/ etc	
	79322 Tanker ships/ boats	786 Trailers/ caravans/ etc	
	79328 Passenger ships/ boats		
	79329 Warships, lifeboats		
	79351 Dredgers		
	79359 Light/ fire/ crane vessels		
	7937 Tugs and pusher craft		
<b>8 Chemical and Plastic Products</b>			
	541 Pharmaceut exc medicamnt	515 Organo-inorganic compnds	
	542 Medicaments include vet	531 Synth org colour agents	
	525 Radio-active etc matrial	591 Household/ garden chemical	

551 Essent.oil/perfume/flavr  
 553 Perfume/toilet/cosmetics

581 Plastic tube/pipe/hose  
 582 Plastic sheets/film/etc  
 893 Articles nes of plastics  
 514 Nitrogen function compds  
 583 Monofilament rods/sticks  
 524 Other inorganic chemical  
 593 Explosives/pyrotechnics  
 533 Pigments/paints/varnish  
 597 Oil etc additives/fluids  
 598 Misc chemical prods nes  
 574 Polyacetals/polyesters..  
 532 Dyeing/tanning extracts  
 575 Plastic nes-primary form  
 572 Styrene primary polymers  
 592 Starches/glues/etc.  
 516 Other organic compounds  
 554 Soaps/cleansers/polishes  
 513 Carboxylic acid compound  
 571 Primary ethylene polymer  
 573 Vinyl chloride etc polym  
 511 Hydrocarbons/derivatives  
 579 Plastic waste/scrap  
 522 Elements/oxides/hal salt  
 512 Alcohols/phenols/derivs  
 523 Metal salts of inorg acid  
 562 Manufactured fertilisers







**UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION**  
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria  
E-mail: [policy@unido.org](mailto:policy@unido.org)

**DEUTSCHE GESELLSCHAFT FÜR INTERNATIONALE ZUSAMMENARBEIT (GIZ) GMBH**  
Friedrich-Ebert-Allee 40, 53113 Bonn, Germany  
E-mail: [sv-nawi@giz.de](mailto:sv-nawi@giz.de)

Website: [www.equip-project.org](http://www.equip-project.org)