TANZANIA INDUSTRIAL COMPETITIVENESS REPORT 2012

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

GOVERNMENT OF
THE UNITED REPUBLIC OF TANZANIA

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Acknowledgements

The Tanzania Industrial Competitiveness Report 2012 (TICR 2012) is a product of the partnership between the Government of the United Republic of Tanzania and the United Nations Industrial Development Organization (UNIDO) in the context of the United Nations Development Assistance Plan 2011-2015 (UNDAP). The TICR 2012 is the first analytical report prepared under the joint MIT, POPC, ZMTIM and UNIDO program on "Building institutional capacities for industrial policy design, implementation, monitoring and evaluation".

An inter-organizational Industrial Policy Group (IPG) set-up and trained by UNIDO was responsible for the analysis presented in the TICR 2012. Hence, it represents a true national effort, facilitated by UNIDO, to provide thorough quantitative analysis as an important prerequisite for effective evidence-based industrial policymaking in the country. The report does not attempt to develop an industrial policy for Tanzania. It presents a solid quantitative assessment of the performance of the manufacturing sector, sheds light on key challenges and opportunities for Tanzanian industry and proposes a number of high priority and practical industrial policy recommendations. These recommendations are essentially a compilation and expansion of policy concerns that emerged from a review workshop which was held in Dar es Salaam to validate the analytical findings of this report. Accordingly, these policy recommendations are not meant to be exhaustive and may therefore not reflect all issues that are relevant for Tanzanian industry today.

The review workshop provided the platform for members of the IPG to present the findings of the TICR 2012. At this event, key industrial policy makers – including Dr. Phillip Mpango (Executive Secretary of POPC), Ms. Joyce K.G. Mapunjo (Permanent Secretary of MIT) and Mr. Rashid A. Salim (Deputy Permanent Secretary of ZMTIM) – provided valuable feedback and validated the findings of the report. The workshop also benefitted from the active participation of various representatives of the government, private sector, think tanks and development partners as well as the UNIDO Representative in Tanzania, Mr. Emmanuel Kalenzi. The workshop was followed by a working session under the leadership of the advisory board of the TICR 2012 and involved the IPG members who were responsible for the analysis of this report. UNIDO staff members acted as facilitators and technical advisors to this national effort.

Ms. E. Sikazwe, Ms. E. Pallangyo (Director and Deputy Director at MIT), Mr. P. Kessy (Deputy Executive Secretary at POPC) and Mr. S. Hamad (Director at ZMTIM) provided overall support and guidance for the elaboration of the TICR 2012. The report significantly benefitted from the inputs and supervision of an Advisory Board, composed of Prof. Samuel Wangwe (Executive Director, REPOA) and Dr. Bitrina Diyamett (Executive Director, STIPRO). Dr. Mohammed Hafidh (Consultant) provided additional valuable background information.

The writing team of the TICR 2012 included several analysts of the Inter-Organizational Industrial Policy Group (IPG) that was set up and trained by UNIDO: Mr. Abdulla R. Abdulla (ZMTIM), Mr. Arun Jacob (POPC), Ms. Falecia Massacky (UDSM), Ms. Esther Mkenda (MIT), Mr. Musambya Mutambala (STIPRO), Ms. Dotto Nkonya (POPC) and Ms. Neema Rutatina (REPOA). The UNIDO staff members Mr. Manuel Albaladejo and Mr. Philipp Neuerburg were the main authors responsible for the compilation of the report and provided the conceptual framework and technical guidance to the drafting team.

The report also benefited from analytical inputs provided by Ms. Maria Elena Ayala (UNIDO Consultant) and Mr. Brian McCrohan (Junior International Expert, UNIDO), who was based in Dar es Salaam to support the drafting team. Chapter six of the TICR 2012 is based on a background paper that was produced by UNIDO Consultants Mr. Antonio Andreoni (author) and Mr. Florian Kaulich (statistical analysis). A number of trainees from UNIDO's training courses in Tanzania provided additional inputs: Ms. M. Abdallah (UDSM), Mr. D. Kimolo (BOT), Mr. M. Makame (ZNCCIA), Ms. N. Mjema (MIT) and Mr. A. Songole (Mzumbe University).

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FOREWORD

Industrial development has recently taken centre stage in the policy debate in the United Republic of Tanzania. The adoption of the Long Term Perspective Plan (2011/12-2025/26), which advocates for industry to drive the socio-economic transformation envisioned in the TDV 2025, and the Integrated Industrial Development Strategy (2011-2025), confirms that the Government of the United Republic of Tanzania conceives industrialization as the main catalyst to transform the economy, generate sustainable growth and reduce poverty.

Despite the past and current efforts to boost industrialization, paramount challenges remain. Macro-economic stability policies, trade liberalization and regional integration have paved the way but proven insufficient. With manufacturing still accounting for less than 10 percent of national GDP, Tanzania remains one of the less industrialized countries in the world. Diversifying away from an unproductive agricultural sector and from low value-added extractive industries is a prerequisite if Tanzania is to achieve its development vision in 2025.

In this context, the release of the Tanzania Industrial Competitiveness Report 2012 (TICR 2012) — a result of the collaboration between the Ministry of Industry and Trade (MIT), the President's Office Planning Commission (POPC) and the United Nations Industrial Development Organization (UNIDO) — is timely as it contributes to the ongoing debate and raises important policy issues. This report focuses on the manufacturing sector to identify key areas of intervention. Using UNIDO's methodology and indicators, it assesses Tanzania's industrial performance vis-à-vis other countries in the region and role models in Asia and sheds light on strategic short- and long-term industrialization paths for Tanzania.

The TICR 2012 highlights several areas of policy focus: the effect of regional integration on Tanzanian industry and the challenges ahead, the domestic and international opportunities that emerge in the new global market for manufactures, the key role of modern skills for industrial development, and the likely 'quick win' scenario of a resource-based industrialization process.

We sincerely hope that the TICR 2012 will be deemed a valuable contribution to the existing debate on industrialization in Tanzania, as well as a useful document for policymakers in the formulation of evidence-based industrial and trade policies.

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Minister of Industry and Trade

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SECTION A: SETTING THE SCENE

1. Introduction and theoretical underpinnings

1.1 UNIDO's methodology and institutional capacity building

UNIDO has developed a series of industry-related indicators and indices to assess national industrial performance. This methodology is the fruit of years of research and advisory work carried out under the guidance of the late Professor Sanjaya Lall of Oxford University. These indicators have been widely used by policymakers and the private sector around the world. UNIDO's Competitive Industrial Performance (CIP) index captures 'the ability of countries to produce and export manufactured goods competitively' (UNIDO 2002-2003: 42) in a simple, intuitive combined measure.

The central tenet of UNIDO's approach to support industrial policymaking in developing countries is to build national institutional capacity for policy design and implementation. Within the scope of the programme, UNIDO sets up and trains inter-ministerial intelligence units to produce analytical reports on their own. The TICR 2012 is the first major output of UNIDO's institutional capacity building programme in Tanzania.

The report is structured around four sections: a) theoretical background of the analysis; b) analysis of Tanzania´s industrial performance at the macro-level compared with regional and international comparators; c) analysis of some key challenges and opportunities for industrialization in URT; and d) policy recommendations.

The first section – "Setting the Scene" – presents an introduction to the challenges countries face in the industrial development process. Special attention is given to the changing context of industrialization and to the identification of the structural drivers of industrial competitiveness. This section makes the case for industrial development in Tanzania, provides an overview and challenges facing the manufacturing sector and a historical perspective of the government's initiatives to industrialize through industrial policies.

The second section – "Competitive Industrial Performance" – ranks Tanzania's industrial performance within the context of international comparators using UNIDO's CIP index. This section seeks to track Tanzania's performance at the macro-level, including the analysis of Tanzania's trade vulnerability to changes in demand or increased competition using the manufactured Product Diversification Index and the Market Diversification Index. Furthermore, it analyses Tanzania's ability to adapt production and compete in the world's most dynamic markets.

The third section – "Key challenges and opportunities for industrialization in URT" – analyses crucial areas that require special attention to improve Tanzania's industrial competitiveness in the world. It examines the impact of regional integration, identifies competitive threats and opportunities in the domestic and international market, presents the current status of modern skills for industry and explores the prospects of resource-based industrialization. The

final section provides a list of policy recommendations for increasing industrial competitiveness in URT.

1.2 The new industrialization scenario

The context in which industrialization occurs is changing. Rapid and profound technological change, the globalization of production systems in every industry and the emergence of new competitors have created an entirely new context for sustainable industrial development. The challenge is particularly paramount for countries that have yet to realize their industrial potential. Tanzania, where manufacturing continues to play only a marginal role, has not benefited from increased flows of FDI and the internationalization of industry. However, the new scenario offers opportunities for countries whose policymakers understand its main features and act upon these. The key elements that are shaping the new industrial scene are:

- *Rapid technological progress affects all economic activities,* rendering previous technologies and modes of organization obsolete. This means that every country, regardless of its level of income and development, has to keep abreast of new technologies if it is to compete globally;

- *International competitiveness has become crucial,* partly because economic distance is shrinking as transport and communication costs fall, and partly because most countries are opening their economies to trade. There is, however, a more important underlying reason for this trend: tapping the productive potential of new technologies requires countries to more fully participate in global flows of products and inputs – tangible and intangible – and to specialize in ways that maximize the returns to their productive factors;

- *The essence of competitiveness is innovation and learning*, mastering new technologies and complementary advances in business management, organization and networking. This is true in developing countries as well as in highly industrialized ones. As UNIDO's *Industrial Development Report 2002-2003* asserts, and which still holds today, developing countries can only tap the existing reservoir of knowledge if they can build the required skills, technological capabilities, entrepreneurship, infrastructure and institutions to master new technologies efficiently. This is not an easy task. It requires more than simply 'opening up' to markets for goods, capital and knowledge. The technological learning process is complex, protracted and demanding, and calls for strategic government intervention;

- *Products and resources* – components, equipment, capital, technology and high-level skills – *move around the globe more easily and rapidly.* The 'death of distance' is the compelling reality within which industrial companies have to grow and compete;

- *The role of transnational companies (TNCs) in world productive activity is increasing,* as they become the main engines of product and factor mobility. TNCs conduct around three quarters of world trade, with some 40 percent of this trade taking place within corporate systems rather than on open markets. Intra-firm trade covers some of the most dynamic, technology-intensive activities in the world and entry into these activities necessitates TNC participation;

- One important consequence of the falling costs of distance and liberalization is that *national value chains are more closely linked to global value chains.* Global value chains are now more tightly organized, with a few lead players or "system integrators" acting as focal points for innovation, product development, the securing of raw materials, locating production, transferring information and technologies, organizing the logistics of transportation and handling marketing and promotion. The lead firms in each chain play important roles: they control what is produced, where it is produced, by whom, what quantity, at what price and how (by what processes). Who governs the chain depends on chain type and its stage of technological development. The nature of industrial organization and global value chains is changing as competitive pressures force firms to specialize more narrowly and offload all activities that are not essential to their core competencies.

This implies that the determinants of competitive advantage are changing. Resources are being moved across the globe and efficient, reliable and technologically capable producers are being sought. However, these mobile resources need to be complemented by immobile ones in host economies, which do not only entail basic natural resources or abundant labour, but technological and organizational skills, good supplier networks and infrastructure, and support services for training, technology and R&D. Countries have to develop these competitive factors to

reap the benefits of new technology and global value chains.

Many of these competitive factors develop not only in independent firms, but also in clusters of related firms located in proximity of each other. Many of these new advantages develop faster where firms can share knowledge, skills and innovation, and the promotion of dynamic clusters is now an important tool of competitiveness strategy.

Information and communication technology (ICT) plays a particularly important role in industrial development. The management of global value chains is highly dependent on rapid, efficient and cheap communication. Building the infrastructure and skills required for effective ICT use is crucial if countries are to compete in such chains.

To obtain new technology from leading foreign enterprises, conscientious strategies to attract and target foreign investment need to be implemented. In fact, sophisticated strategies of investment promotion are a key instrument in competitiveness development.

1.3 Conceptual framework

The concept of industrial competitiveness is defined as *the capacity of countries to increase their industrial presence in domestic and international markets while developing industrial structures in sectors and activities with higher value added and technological content*. Competing through innovation and learning may result in countries obtaining greater and more sustainable industrial margin (UNIDO, 2002-2003).

It is imperative for policymakers to create a 'checklist' of the key determinants of industrial competitiveness. This is not an easy task. Many social, historical, political and economic factors affect industrial development, and the effects vary over time and by context. Nevertheless, it is useful to list the relevant economic factors that now shape industrial development and to amend the list for specific country conditions and priorities.

This report draws on UNIDO's framework to identify the 'structural drivers of industrial competitiveness' (Figure 1). The industrial system with its main actors (local producers, suppliers, buyers, institutions and policymakers) lies at the core of this framework. Industrial systems can be divided into sectors, subsectors and clusters. Actors cooperate and compete with each other, their interactions conditioned by local rules, regulations, customs and social capital. The result is a social and economic *milieu* that affects industrial development as well as the national system of innovation and learning in the country. A strong system produces rapid and widespread learning and broad-based competitiveness. A weak one leads to inefficiency, lags and the inability to compete.

Industrial development fundamentally depends on the international context. As already noted, this context is changing rapidly, driven by globalization, liberalization and technological change. Specifically, it is characterized by tighter linkages within global value chains based on close coordination between national and international actors within integrated systems. The success of national industries thus increasingly depends on firms' ability to build technological competence in given products, processes or functions.

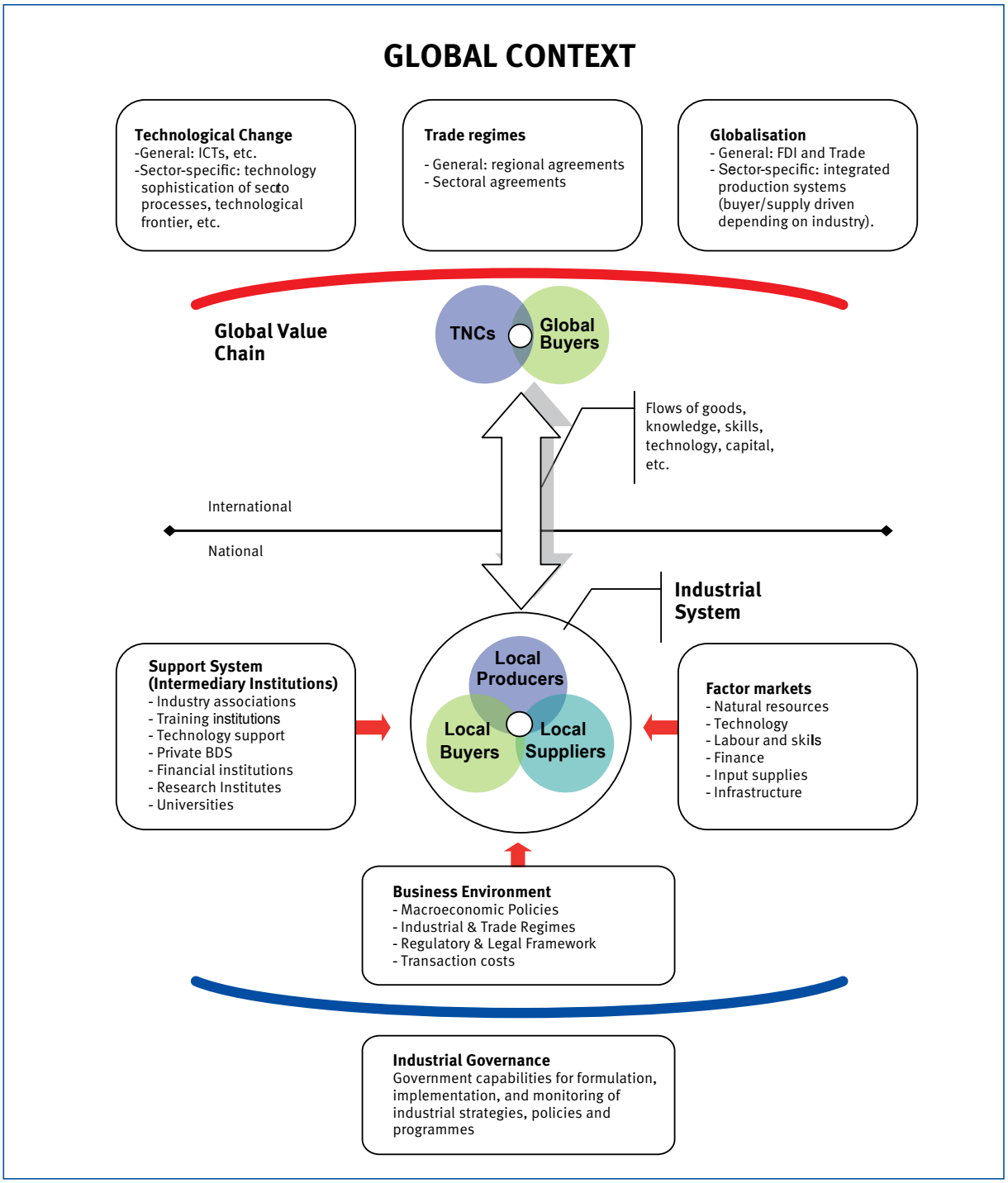
Industrial development also depends on the business environment (the 'framework conditions'), the efficiency of factor markets (for labour, skills, technology, finance, inputs and infrastructure) and the quality of support available from intermediary institutions (for training, technological services, R&D, and so on). Government policies can improve or worsen these structural determinants of industrial development; hence, governance (the ability to form, implement and monitor policies) assumes considerable significance.

Many markets in developing countries are inefficient and the necessary institutions are absent. In many cases, these deficiencies have emerged as a result of past government policies, and revitalizing industry thus requires the removal of inefficient interventions. In other cases, the government will have to launch new interventions to create or improve markets and institutions that are absent or dysfunctional.

Identifying *where* and *how* government should intervene (less, more or differently) is the essence of sound industrial policy. This process needs to consider the *global technological context* and trends in the *value chains* in which national industries operate as well as their *position* in these chains. Furthermore, the learning prospects, technology levels, spillover benefits and costs involved need to be understood. As technological conditions have changed and new challenges have emerged, optimal industrial policies today differ from those which succeeded two or three decades ago. It is thus important to interpret earlier experiences with great care.

One of the key challenges new industrial policies must factor in is the environmental impact of industrialization. In the past, policies rarely assessed the environmental cost and degradation caused by industrial activity. This has now become a priority in developed countries which are taking serious measures to cut emissions and waste through the use of clean technologies and environmentally sound production practices. Unfortunately, little is known about these impacts in the developing world. Lack of awareness about the impact of highly polluting activities combined with reliance on subsistence agriculture, which contributes to soil erosion, deforestation and desertification, has resulted in a critical deterioration of the environment in most developing countries. This suggests that sound industrial policies have to turn 'green' through proper management of natural resources and the adoption of low-waste clean technologies.

Figure 1: Analytical and conceptual framework for industrial competitiveness



Source: UNIDO

1.4 Methodological considerations

Some important methodological considerations need to be outlined:

- *The importance of benchmarking*. A comparison of countries in terms of performance and industrial capacities is intrinsic to this methodology. Benchmarking is necessary because industrial competitiveness is a relative concept; hence, comparisons are essential for determining whether a country is more or less competitive in relation to other countries. The TICR 2012 benchmarks Tanzania against 13 countries based on several criteria: "neighboring countries", "immediate competitors", "future competitors" and "role models" (in reality, many country comparators meet more than one criterion);

- *The use of UNIDO's technological classification for manufactured trade and manufacturing value added (MVA)* (see Annex 1). The TICR 2012 uses UNIDO's technological classification to shed light on the evolution of production and export structures in Tanzania and its comparators. It distinguishes between resource-based, low-technology, medium-technology and high-technology products both in manufactured exports and MVA.[1] The technology classification, albeit with significant caveats which are discussed later, provides key insights on industrial transformation. A shift of the production and export structure towards 'complex' activities indicates domestic technological deepening and upgrading. The statistical annex provides detailed product classifications;

- *Use of quantitative and transparent data*. The TICR 2012 does not rely on business perceptions to assess Tanzania's industrial competitiveness. Notwithstanding their usefulness, perception-based surveys generate partial indicators for inter-country comparisons, as the views of individuals and companies are shaped not only by objective circumstances, but by subjective and context sensitive factors as well. UNIDO's methodology relies on a number of carefully selected objective, outcome-based indicators published by international organizations. Although quantitative indicators will never be perfect proxies of what they intend to measure, they provide a solid foundation for cross-country analysis;

- *Use of international data sources and classifications for cross-country comparisons*. When measuring a country's industrial performance, one can rely on the available national data and the commonly applied product classifications (e.g. sectors that fall into the manufacturing category). However, when comparing the performance of several countries over time as the TICR 2012 does, the usage of national data sources and classifications comes at a cost. Individual countries report data in different ways and use different nomenclatures and differing product classifications and aggregations, which can lead to serious incomparability issues. To avoid this, the TICR 2012 relies on international data sources and classifications that allow a comparison of all countries that report data to the relevant international organizations (UNIDO, UNCTAD and WB);

- *Analysis of levels and trends*. The TICR 2012 assesses Tanzania's industrial performance as well as the overall trends for a specific period. Such an analysis is particularly useful for countries experiencing high levels of growth, which have not yet achieved the rates of development typical of industrialized countries. The analysis covers the period 2000-2010 for all countries, but presents more recent data when available;

- *Macro and sectoral analysis*. Macro analysis provides a general overview of a country's industrial competitiveness vis-à-vis other countries. The prime example of macro analysis in manufacturing is UNIDO's Competitive Industrial Performance (CIP) index. However, composite indices at the macro level are of limited use when designing policies as they usually overlook sectoral dynamics. Many reports lack sectoral analysis, leading to overly generalized policy recommendations. By using UNIDO's methodology, the TICR 2012 combines macro with sectoral analysis, enabling policymakers to establish realistic and applied parameters. The depth of sectoral analysis depends on various factors, including data availability and the objective of the study. The TICR 2012 analyses sectoral performance at the 3-digit level in SITC revision 3.

1 **-Examples of resource-based manufactures** are prepared meats/fruits, beverages, wood products, vegetable oils, and ore concentrates, petroleum/rubber products, cement, cut gems and glass. **Examples of low-tech manufactures** include textile fabrics, clothing, headgear, footwear, leather manufactures, travel goods as well as pottery, simple metal parts/structures, furniture, jewellery, toys and plastic products. **Examples of medium-tech manufactures** are passenger vehicles and parts, commercial vehicles, motorcycles and parts, synthetic fibres, chemicals and paints, fertilizers, plastics, iron and pipes/tubes as well as engines, motors, industrial machinery, pumps, switchgear, ships and watches. **Examples of high-tech manufactures** include office/data processing/telecom equipment, TVs, transistors, turbines and power generating equipment as well as pharmaceuticals, aerospace, optical/measuring instruments and cameras.

1.5 Limitations of the report

No methodology is flawless, and the TICR 2012 is no exception. There are several limitations to UNIDO's methodology which the reader should bear in mind:

- *The concept of competitiveness has its detractors.* For example, Krugman (2003) asserts that competitiveness may be a "dangerous obsession" because – according to the theory of comparative advantage – a country cannot be competitive in all sectors. Consequently, attempts to measure competitiveness at the national level is an unsound exercise, as it obscures the country's microeconomic (i.e. enterprise level) advantages. Despite this criticism, the TICR 2012 is based on the assumption that the assessment of competitiveness is a useful dimension to the analysis of industrial policy to the extent that it uses meaningful quantitative indicators and takes sectoral dynamics into account. For a competitiveness study to be credible, its scope must be reduced. Competitiveness can be such a broad concept that being as specific as possible is key. This report therefore limits the scope of the inquiry to the manufacturing sector;

- *UNIDO's technology classification is based on several assumptions that do not always accurately reflect the technological content of specific activities.* Sophisticated processes can occur in lower-technology sectors, while some activities in high-tech industries can be rather simple. Take the use of computerized-aided design in the clothing industry or the basic assembly operations in the manufacture of semiconductors as an example. UNIDO's methodology aggregates sectors and consequently categorizes industries, disregarding these anomalies. Second, the technology classification fails to discern upgrading within sectors – technology upgrading thus only occurs when a country shifts from one industry to another. This is a major limitation that can only be overcome by sector and product-specific analysis. It is important to keep these limitations in mind when providing policy recommendations for Tanzania. Although this report suggests that Tanzania can strongly benefit from a structural shift towards complex technology sectors, it also argues that sophistication and industrial deepening takes place in resource-based and low-tech manufacturing as well;

- *Lack of data to analyse industrial capabilities.* UNIDO's methodology to assess industrial competitiveness also includes an analysis of industrial capabilities or 'drivers of industrial competitiveness'. While the TICR 2012 presents some key challenges and opportunities for industrialization in Tanzania, it does not include a detailed quantitative analysis of the drivers. The reason for this is the lack of reliable and comparable data for some of the relevant indicators for structural factors like infrastructure, investment, innovation and productivity. With regard to human skills formation, which is arguably the single most important driver of industrial competitiveness in a low-income country context, we were able to obtain quantitative indicators and derive several recommendations from a new industrial skills survey that was jointly conducted by the Government of Tanzania and UNIDO;

- *Lack of data to quantify the environmental consequences of industrial growth.* This means that the report does not address the question of a possible conflict (or complementarity) between industry and the environment in Tanzania. Without the 'green' dimension, the report admittedly falls short in providing policy recommendations for sound green industrial policies;

- *Lack of industrial data at the sub-national level for regional analysis.* This implies that the analysis is mostly limited to the macro-level of the United Republic of Tanzania, with a few specific inputs on the case of Zanzibar. As national competitiveness is determined at the regional (meso) as well as at the firm level (micro), future efforts should aim at a more disaggregated database that allows for regional industrial analysis.

The shortage of data for many industrial indicators is a crucial issue that policymakers need to take into account. Without the necessary information, industrial policy design, implementation, monitoring and evaluation will not be feasible. The Government of Tanzania, in particular the National Bureau of Statistics and the Ministry of Industry and Trade, is cooperating with UNIDO to improve the national industrial statistics system, and two annual surveys (ASIP), which offer a long list of key indicators with high relevance for policy analysis and strategy design, have already been conducted. This key initiative needs to be continued and expanded in the future to allow for a more balanced and exhaustive industrial competitiveness analysis.

2. Industrialization in Tanzania

2.1 Why industrialization matters

In his most recent book, the internationally acclaimed Cambridge economist Ha-Joon Chang devotes one full section to the importance of manufacturing for economic growth (Chang, 2007). Chang claims:

> *"History has repeatedly shown that the single most important thing that distinguishes rich countries from poor ones is basically their higher capabilities in manufacturing, where productivity is generally higher, and, most importantly, where productivity tends to (although does not always) grow faster than in agriculture and services" (Chang, 2007:213).*

Recent economic developments in East Asia certainly provide a solid argument for boosting manufacturing. Is this of any relevance to less advanced, agriculture-based countries like Tanzania? A large body of empirical evidence suggests that manufacturing is key for growth and job creation:

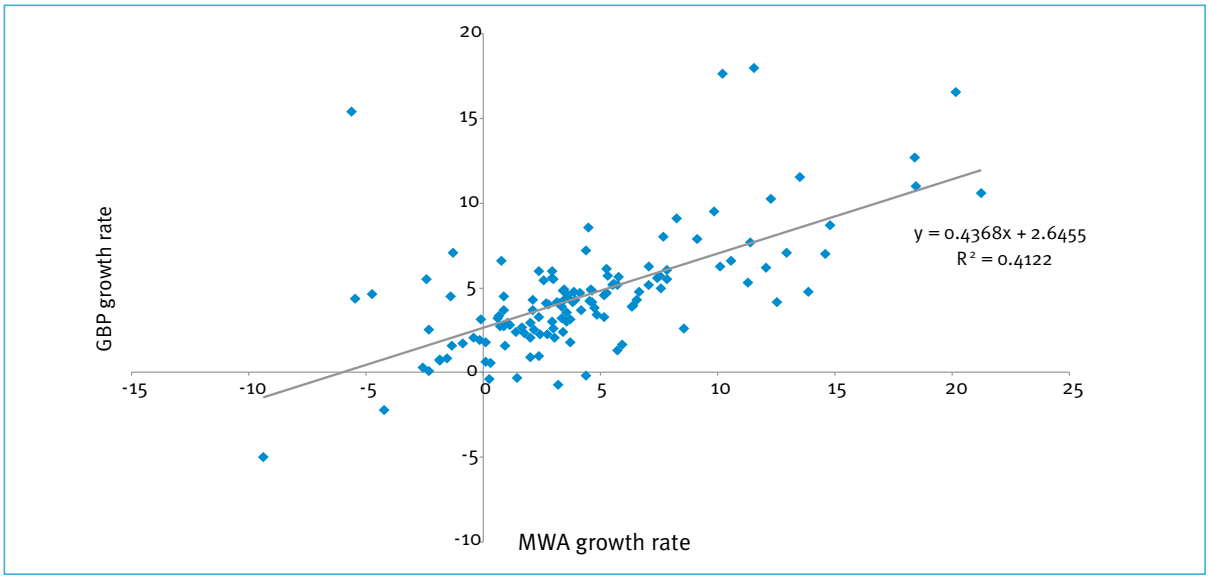
- First, evidence not only indicates that *industrialization is linked to economic growth,* but that manufacturing can also play a catalytic role in transforming the economic structure of agrarian societies. Figure 2, published in UNIDO's Industrial Development Report 2009, illustrates the positive relationship between GDP growth and MVA growth for a sample of 131 countries;

- Secondly, *manufacturing accounts* for the bulk of world exports (78 percent in 2010), *and is less exposed to external shocks, price fluctuations, climatic conditions and unfair competition policies.* The price of manufactured goods tends to be more stable than that of commodities. Unfair competition policies have distorted prices around the world, limiting the potential for export growth in some commodities;

- Third, *manufacturing generates externalities in technology development, skill creation and learning that are crucial for competitiveness.* For instance, manufacturing is the main vehicle for technology development and innovation, representing the hub of technological progress. Industry uses technology in many forms and at different levels to increase returns to investments by shifting from low to high productivity activities. Manufacturing also offers great potential for informal innovation activities such as ad hoc incremental improvements in products and processes;

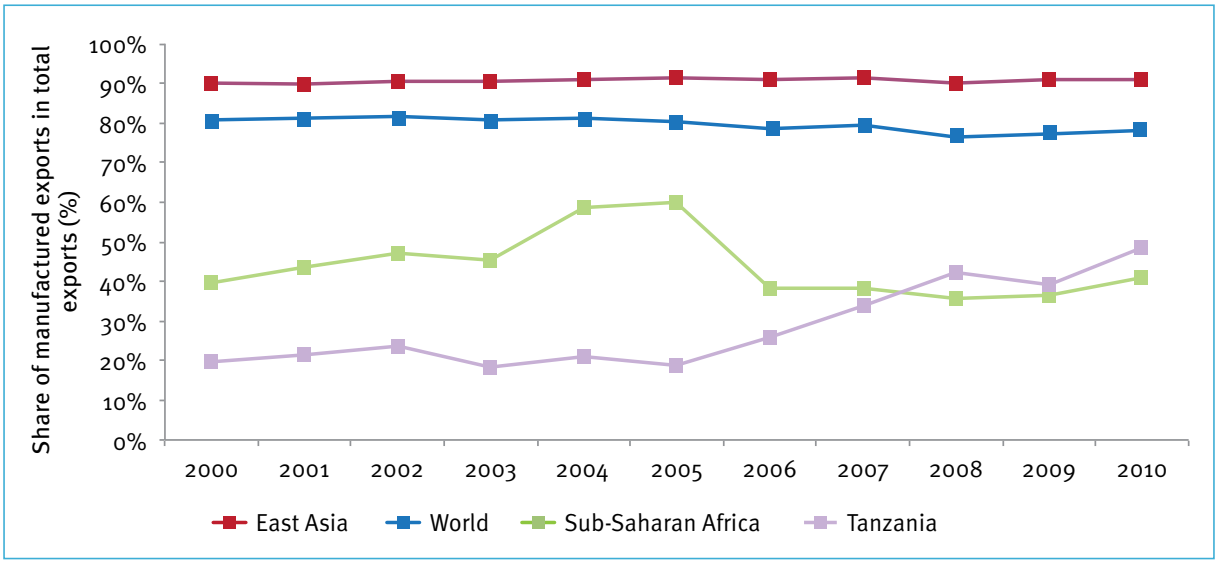
- Fourth, *manufacturing has a 'pull effect' on other sectors of the economy.* The development of the manufacturing sector stimulates demand for more and better services: banking, insurance, communication and transport;

Figure 2. Relation between GDP growth and MVA growth, 2000-2005



Source: World Development Indicators

Figure 3. Trends in manufactured trade as percentage of total trade, 2000-2010



Source: UN-COMTRADE

- Finally, the *internationalization of production has spread the benefits of manufacturing*. The geographical distribution of the activities of TNCs has benefited the manufacturing sector in the developing world more than other sectors of the economy. The trend towards the vertical disintegration of production activities in industrialized countries means that developing countries have higher chances of integrating into global value chains.

2.2 Overview of the manufacturing sector in Tanzania

After decades of macro-economic stability policies, trade liberalization and regional integration, and despite improvements in the 2000s, the performance of Tanzania's manufacturing sector remains unimpressive. Tanzania lags behind regional role models both in terms of the quantity and quality of industrial goods produced and exported. It continues to rely heavily on an unproductive agricultural sector, the extractive sector and low value-added manufacturing. MVA as a share of GDP has mostly stagnated at roughly 9.5 percent between 2000 and 2010, which is still below the average for the region, making Tanzania one of the least industrialized countries in the world.

Manufacturing value added is also highly concentrated in a few low-tech sectors, making Tanzania's industry vulnerable to international competition and limiting its ability to improve through learning and innovation. Food and beverages alone account for nearly half of total manufacturing value added, followed by non-metallic mineral products (11 percent), tobacco (7 percent) and textiles (5 percent). Industrial activity is largely concentrated in Dar es Salaam (more than half of all large manufacturing establishments are located there) and to a lesser extent in Arusha. The remaining 14 percent is spread out between Mwanza, Singida, Tanga, Kagera and Kilimanjaro (ASIP, 2009).

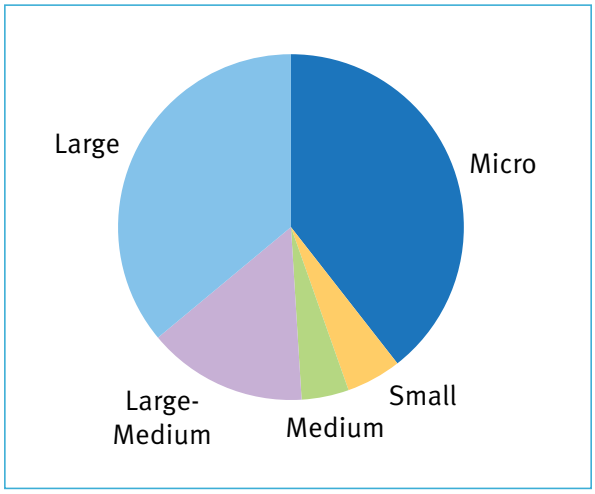
Accounting for 91 percent of all manufacturing establishments, private-owned companies dominate the manufacturing sector. As a consequence of the privatization process, large public-owned enterprises have seen their numbers dwindle to 56, which corresponds to around 8 percent of all manufacturing enterprises, with the remaining enterprises being mixed (ASIP, 2009).

Large-scale industry is fairly limited in Tanzania. Enterprises with fewer than ten employees account for 97 percent of all manufacturing enterprises, and according to the NBS Business Survey 2007/2008, most of them are family-owned firms with less than five employees. Yet manufacturing is not the preferred option of business start-ups which usually seek to engage in commercial activities that generate petty income.

Manufacturing has also failed to create formal employment for Tanzanians, particularly in the SME sector. Manufacturing employment accounts for less

than 5 percent of the total labour force, with the largest 40 manufacturing companies employing 36 percent of all manufacturing labour. This is equivalent to the employment generated by 24,000 micro enterprises (see Figure 4). What is perhaps more worrying is the fact that only 11 percent of industrial employment has been generated by firms which began operations in 2005 or later. Clearly, new investments in manufacturing have not yet resulted in significantly more jobs. This may be attributable to the current focus on capital-intensive, resource-based sectors (e.g. extractive industries) at the expense of traditional labour-intensive manufacturing (e.g. textiles and clothing, etc.).

Figure 4: Industrial employment by firm size



Source: ASIP, 2012

Analysing job creation by region provides interesting insights into the patterns of manufacturing employment. On the one hand, regions like Manyara, Tabora, Mtwara, Kilimanjaro, Lindi and the coastal region paint a perturbing picture of very low job creation in the manufacturing sector (less than 5 percent of current manufacturing employment was created after 2005). In Morogoro, only one new company with 27 employees was established between 2005 and 2009. On the other hand, Arusha has experienced an impressive growth with 8 newly created companies which have recently generated 5,000 jobs. Iringa has seen a large expansion of industrial agro-processing, with 50 percent of current employment in companies created between 2000 and 2009.

The sectors in Tanzania that display the highest share of employment in new companies are the paper, textiles, electrical equipment and manufactures of basic metals sectors. The textiles sector has created the largest number of jobs in new companies, while the food sector accounts for the second highest number of jobs created in new companies, although older companies continue to be the largest employers. The biggest concern is the lack of a critical mass of firms in a variety of sectors. In other words, companies in Tanzania are focused on a narrow spectrum of industrial activities.

2.3 Industrial policy in Tanzania

In the decades after Tanganyika and Zanzibar created the United Republic of Tanzania, the government recognized the leading role the industrial sector would play in the transformation of Tanzania's economy. Over the years, efforts were made to liberalize the economy and change the system from a planned economy to a market economy, encouraging more active participation of the private sector to accelerate growth and increase the nation's prosperity. In this setting and considering the high dependence of Tanzania's economy on the agricultural sector, policymakers emphasized the need to build a competitive industrial sector to transform the economy. Industrial policies continue to be formulated to address the challenges that arise to this very day:

1960 – 1980. Following independence, the government invested heavily in Tanzania's manufacturing sector, which was virtually non-existent at the time, allowing the sector to grow smoothly throughout the decade. However, this trend changed dramatically due to a serious economic crisis caused by external shocks and internal constraints during the late 1970's;

1980 – 1995. Sweeping and wholesale trade liberalization, a key ingredient of structural adjustment packages, had a negative impact on the incipient manufacturing sector. Infant industries were particularly affected by the sudden removal of protective trade measures and subsequent massive import flow. Industrial stagnation was further severely affected by declining agricultural yields and poor product quality. To address the crisis, the government adopted restrictive measures, but it was only in 1986, after the conversion of the economic system from a planned to a market economy, that the country returned to the path of recovery. While Tanzania's manufacturing sector showed positive signs of revitalization, it faced international competition (mainly from Asian products), which caused several industries to close down;

1996 – 2000. During the second half of the 1990's, the government developed 'The Sustainable Industrial

Development Policy (SIDP) 1996-2020', the main purpose being to shift the economy's engine of growth from the public to the private sector[2], making the latter the key player. The idea in the short run was to consolidate the existing national capabilities in the sector, and to build up new capacities in activities with competitive advantages for export markets in the medium term. This phase was characterized by an improved enabling environment, including the provision of fiscal incentives, transparency, a stable and simple regulatory framework and macroeconomic stability. As a result, the industrial sector started to grow steadily and achieved a high growth rate in the 2000's;

2000 – today. Since 2000, consistent economic reforms have transformed Tanzania's manufacturing sector. It got on the track of recovery and has experienced gradual but steady growth due to the acquisition of productive facilities by the private sector and the inflow of foreign direct investment. However, the country continues to be dependent on agricultural and resource-based products with limited value addition. The relevance of the industrial sector has been reflected in many key government policy documents and initiatives of the last decade. Some of these main policy initiatives and development strategies include:

- **Tanzania Development Vision (TDV) 2025:** The vision document marks a significant milestone in the era of reform of Tanzania and lays the foundations for the country's new policy framework. TDV explicitly "*aims to transform the nation from a least developed country to a middle income country by 2025 through transformation from a weather and market dependant agricultural economy to a self-sustaining semi-industrialized economy*". This shift in focus from an 'agricultural economy' to a 'semi-industrialized' one was essential for the ailing industrial sector of Tanzania. Yet the failure to put in place a framework for the implementation of TDV 2025 at the inception stage represented the biggest impediment to the implementation of TDV goals;

- **National Trade Policy 2003:** The trade policy was drafted by the Ministry of Industry and Trade and strictly followed the principles stated in the TDV by focusing on private sector led export growth. The National Trade Policy 2003 emphasized '*stimulation and encouragement of value addition*' as one of its chief objectives;

- **Small and Medium Enterprise Development Policy 2003:** This policy specifically acknowledged the special role of SMEs in the context of Tanzanian industrialization. It aimed to address the constraints to industrialization and to tap the full potential of Tanzania's SME sector. The policy had a beneficial impact on SME performance, but many constraints it aimed to address still exist to this day. A review of this policy is currently underway;

- **Tanzania Mini-Tiger Plan 2020:** This plan was introduced in 2005 as an effort to fast-track the implementation of TDV 2025, by replicating the Asian Tigers model in Tanzania. The plan explicitly states that '*the successful development of the manufacturing sector is the formula that all economically thriving Asian countries followed and it is not an exaggeration to say that the sector's success holds the key of the nation's further development*' (p. 32). The most important contribution of the Mini-Tiger Plan was the introduction of Special Economic Zones in Tanzania (SEZs) and the plan's focus on export-led manufacturing growth. Unfortunately, the Mini-Tiger Plan failed to attract subsequent attention with the donor community's shift in focus towards the implementation of the National Strategy for Growth and Poverty Reduction (NSGRP/MKUKUTA);

- **Export Processing Zones Program**: The programme was initiated by the Export Processing Zones Act of 2002, but was formally institutionalized by the creation of the Export Processing Zones Authority (EPZA) in 2006. The objective of establishing EPZs was, among others, the promotion of investment for export-led industrialization, an increase in foreign exchange earnings, an increase in employment and the promotion of the processing of local raw materials. Currently, six industrial parks are operational in Tanzania, while EPZA have identified 17 regions for developing EPZ/SEZ in future. However, insufficient funds for the

2 To achieve these objectives, the SIDP was designed based on the following implementation phases:
- Short term (1996-2000). The main objective was to focus on the rehabilitation and consolidation of existing industrial capacities through financial, capital and management restructuring. The strategies designed for this included the promotion of the private sector as a key player, attracting FDI, privatization of existing industries, promotion of SMEs, promotion of trade and the creation of a competitive business environment. An extraordinary measure to promote private sector development in those years was the establishment of the Tanzania National Business Council (TNBC) as a platform for private-public dialogue.
- Medium term (2000-2010). The underlying objective of this phase was the creation of new capacities in areas with potential competitive advantages.
- Long Term (2010-2020): The third phase envisaged full-fledged investments in capital goods industries.

development of infrastructure for EPZ/SEZ remain the main constraint for this programme;

- **Five Year Development Plan (2011/12-2015/16) (FYDP I):** After the ten-year review of the TDV 2025, the Government of Tanzania realized that strategic medium- and long-term plans are required to achieve the objectives and goals set by TDV 2025. The overall goal of the first Five Year Development Plan (FYDP I) is to unleash the country's resource potentials in order to fast-track the provision of basic conditions for broad-based and pro-poor growth. The Plan emphasizes the building of a foundation for self-propelling industrialization and export-led growth. The industrial sector has been identified as a core priority in the FYDP. To ensure effective implementation of each priority, the Plan proposes goals and strategic interventions, with the expected key output/target to be achieved by 2015;

- **Long Term Perspective Plan (2011/12-2025/26) (LTPP):** The LTPP is the roadmap for the development of three FYDPs for the realization of the TDV 2025. The plan is not restricted to the broad economic transformation of the country and spells out a detailed industrial transformation path of the country. The removal of the binding constraints to growth through the FYDP I is meant to set the scene for unprecedented growth in the industrial sector (especially of medium-technology industries, natural gas-based and agro-processing) during the FYDP II phase, while FYDP III will focus on further promoting the competitiveness of the manufacturing sector and a substantial improvement in Tanzania's share in global and regional trade. This clear focus of the LTPP will place industrialization at centre stage in Tanzania's future growth agenda;

- **Integrated Industrial Development Strategy 2025 (IIDS 2025):** This is the latest initiative by the Ministry of Industry to provide concrete strategies to implement the SIDP objectives in the new economic environment and contributes to the achievement of the goals stipulated in the Tanzania Development Vision (TDV) 2025. Since most of the industrial development strategies proposed in the IIDS touch on multisectoral issues, it is crucial to establish close collaboration and harmonization with other central and sectoral economic authorities, parties and national planning agencies. The Strategy highlights the horizontal, vertical and supporting framework required to create and position a competitive industrial sector based primarily on labour-intensive industries. The targeted sub-sectors specified in the IIDS 2025 are fertilizer and chemical, iron and steel, textiles, agro-processing, edible oil, processed cashew nuts, processed fruits, milk and milk products, leather and leather products, light machinery and hospitality industry. The IIDS 2025 also mentions the necessary policy measures to boost the industrial sector and contribute to the structural change of the economy.

Considering the sheer number of programmes, plans, strategies and initiatives focusing on industrialization that have been introduced since 2000, one thing becomes quite clear: over the last decade, industrialization has received more attention in the national development framework than ever before. However, what matters far more than the 'priority status' of industrialization in policy documents is priority resource allocation and timely, consistent and effective policy implementation. Unfortunately, the Tanzanian industrial policy framework is found wanting in several of these crucial factors. Some of the successes in industrial performance (analysed in detail in the next chapter) can certainly be directly attributed to some of the government's policy interventions described above. For instance, the liberalization agenda the government has diligently followed since the 1990s has paved the way for major investments in several resource-based sectors. At the same time, there is still considerable room for efficiency gains through policy intervention in the industrial sector. Based on the analysis conducted in this report, we propose a few priority issues for policy intervention in Section D.

The Tanzanian Industrial Policy framework has experienced several transformational phases over the course of time. The trend has certainly been progressive, with the government undertaking remarkable efforts to support the industrial sector. Though many of these strategic efforts failed to register full impacts due to problems encountered in the implementation stages, there are clear signs that the government has learned from past mistakes. Further concerted efforts aimed at better implementation of industrial policies and strategies are imperative for realizing the industrial transformation envisaged in TDV 2025. At the same time, the Revolutionary Government of Zanzibar has also arrived at a turning point, where a new approach towards more effective industrial policymaking is to be implemented in the near future (Box 1).

Box 1: Industrial Policy in Zanzibar

Alongside the initiatives of the URT government to boost industrialization, the Revolutionary Government of Zanzibar has also introduced a list of related policy instruments in the last two decades. The key policies with relevance in particular for industrial development are:

- The Zanzibar Industrial Policy (1998)
- The Zanzibar Vision 2020 (2000)
- The Zanzibar Investment Policy (2005)
- The Zanzibar Trade Policy (2006)
- The Zanzibar SME Policy (2006)
- The Zanzibar Export Development Strategy (2009)
- The Zanzibar Strategy for Growth and Reduction of Poverty 'MKUZA II' (2010).

The 1998 industrial policy document is the initiative that most clearly emphasizes the role of manufacturing in Zanzibar's long-term development. The Vision 2020 focuses on promoting the diversification and transformation of Zanzibar's economy without explicitly mentioning industrial policy. However, the Investment Policy prioritizes manufacturing as a key sector for the attraction of foreign investment, while the Trade Policy also explicitly emphasizes manufacturing activities as a key priority. The 2006 SME Policy also pays special attention to the industrial sector and marks a turning point with regard to the policymaking process. Specifically, it is based on a more comprehensive quantitative analysis of SME activities in several manufacturing sub-sectors, and it was designed with increased private stakeholder participation. The Export Development Strategy aims at diversifying Zanzibar's export basket and prioritizes three manufacturing sub-sectors: handicrafts; clothing/textiles and coconut-related products.

MKUZA II is the prominent medium-term plan for the period 2010-2015 which elaborates strategic interventions to achieve sustained and equitable pro-poor growth in Zanzibar. It has a strong emphasis on the importance of macroeconomic fundamentals and on an improved business climate as key prerequisites for sustained economic growth. Despite its macro-focus, MKUZA II also acknowledges that the support of trade and manufacturing are important components of a pro-poor growth process. It furthermore includes a wide range of institutional and policy reforms to support the private sector. The plan reiterates the significance of implementing existing private-sector development policies (e.g. the SME Policy) and includes a detailed action matrix. With regard to industrial development, it does not, however, explicitly refer to the need for industrial policy interventions and instead places a stronger emphasize on the more comprehensive SME Policy.

In its recent history, Zanzibar has implemented several well-defined policies and strategy documents that aim at achieving economic growth and industrial development. This stands in stark contrast to the limited success of improving its industrial competitiveness, as discussed in the next section of this report. Accordingly, it is crucial to understand why the many important policy initiatives have not yet triggered industrial growth. An evaluation of recent industrial policy initiatives in Zanzibar, which was conducted by the Ministry of Trade and Industry in cooperation with UNIDO, arrives at the conclusion that, despite their sophisticated design, the initiatives' implementation track record has not been satisfactory at all. The reasons for the limited implementation success can be summarized as follows:

- Limited definition of implementation procedures, action plans and M&E frameworks;
- Unsatisfactory alignment and coordination of the individual policy documents despite their overlapping nature;
- Industrialization is not yet a top priority in the government's development vision;
- No clear prioritization of a small number of strategic actions is evident despite limited implementation capacities;
- Insufficient financial and human resources as well as a lack of key industrial policy management capabilities in the government;
- Limited cooperation between public and private stakeholders as far as concrete industrial development initiatives are concerned;
- An insufficient amount and an overall low quality of available economic/industrial data required for an evidence-based policy design;
- Lack of a clear coordination framework for industrial policy initiatives on the three different levels of policymaking (Zanzibar, URT, EAC).

Against the background of these challenges, a new approach to industrial policymaking in Zanzibar is warranted, which is more evidence-based, more strategic/focused and based on a more thorough dialogue between all government and private sector actors.

SECTION B: COMPETITIVE INDUSTRIAL PERFORMANCE

3. BENCHMARKING TANZANIA'S INDUSTRIAL PERFORMANCE

While national data can provide information on the growth of manufactures and exports in the country, international benchmarking allows cross-country comparisons. The fact that national industrial performance is influenced by international factors (international technological change, globalization, regional integration, global competition) makes international comparisons even more relevant for countries to define a well-suited industrial development strategy.

It is also useful to identify best practices for industrial competitiveness since the countries selected are studied to determine which factors led them to become world leaders in industrial development. It is crucial for policymakers to derive lessons from these "role models" and identify strategic paths for industrial growth. It should be noted that this analysis is predominantly based on quantitative indicators. However, to get a complete picture, it is also necessary to include qualitative information which the applied benchmark technique cannot provide.

This section analyses Tanzania's industrial performance and compares it with 13 countries: Botswana, China, Ghana, Indonesia, Kenya, Malaysia, Malawi, Mauritius, Mozambique, Rwanda, South Africa, Uganda and Zambia. The selection was made by an inter-organizational group[3] of analysts who were trained in UNIDO's methodology. The basic criteria used to identify these countries as benchmarks were:

- *Neighbouring countries* that share the same geographical advantages and have similar production structures;
- *Immediate competitors* that, given similar factor endowments, specialize in the same industrial sectors;
- *Future competitors* that are likely to pose a competitive threat in sectors of comparative and competitive advantage;
- *Role models* that suggest obtainable goals for industrial development.

3.1 UNIDO's Competitive Industrial Performance (CIP) index

This section positions Tanzania in UNIDO´s Competitive Industrial Performance (CIP) index, which in a single intuitive measure combines different dimensions of industrial performance. It captures the ability of countries to produce and export manufactures competitively, moving up the technology ladder and increasing value addition by shifting towards technology-intensive sectors.

The results provide a useful benchmarking tool for comparing progress on industrial development

3 The inter-organizational group consisted of Tanzanian government officials from the mainland and Zanzibar as well as private sector representatives and think tank members who participated in the UNIDO training workshop in Zanzibar in March 2012. Due to a lack of available MVA data for Ghana and Rwanda, these countries are not included in Chapter 4.2 (MVA performance).

Box 2: Dimensions, indicators and calculation of the CIP index

The CIP index groups eight indicators in six dimensions of industrial performance:

- **Industrial capacity**. *MVA per capita* is the basic indicator of a country's level of industrialization adjusted for population size. It shows a country's capacity to add value in the manufacturing process. Yet MVA is not always exposed to international competition — inward-oriented polices and trade barriers can limit the exposure of domestic industries to global competition. MVA analysis can show distorting results for countries that have gone through a long period of protectionism and import substitution. This is why it is important to combine MVA with export orientation, which places the competitiveness of industrial activity in the international context.

- **Manufactured export capacity**. In a globalizing world, the capacity to export is a key ingredient for economic growth and competitiveness. *Manufactured exports per capita* is the basic indicator of trade competitiveness: it shows the capacity of countries to meet global demands for manufactured goods in a highly competitive and changing environment. Manufactured exports show whether national MVA is really competitive internationally. MVA also adds to trade analysis as it indicates the extent of value domestic companies add to exports. Trade analysis on its own can cause distortions in the case of countries with low domestic capabilities which are nevertheless used as export platforms by multinational corporations (MNCs).

- **Impact on world MVA**. The impact of a country on world MVA production is measured by its *share in world MVA*, which indicates the relative performance and impact of a country, taking into account total volume of manufacturing production. It shows the position of a country relative to others in terms of its contribution to world MVA.

- **Impact on world manufactured trade**. The impact of a country on world manufactured trade is measured by its *share in world manufactured exports*. It gives the competitive position of a country in international markets relative to others. Gains in world market shares reflect improved competitiveness, while losses signal a deterioration of the country's competitive position.

- **Industrialization intensity.** The intensity of industrialization is measured by the arithmetic average of the *share of MVA in GDP and the share of medium- and high-technology activities (MHT) in MVA*. The former captures the role of manufacturing in the economy while the latter designates the technological complexity of manufacturing. The latter variable gives positive weight to complex activities on the grounds that they are desirable for competitive performance: a more complex structure denotes industrial maturity, flexibility and the ability to move into faster growing activities. However, the measure only captures shifts across activities but not upgrading within them or another important aspect, technological improvement. It is also fairly aggregate and cannot capture fine technological differences within the categories (some low-technology activities may have segments of high-technology and vice versa). These deficiencies reflect the nature of the data, but the broad findings appear to be sound and plausible.

- **Export quality**. The quality of exports is measured by the simple arithmetic of the *share of manufactured exports in total exports* and the *share of medium- and high-technology products in manufactured exports*. The reasoning is similar to that of industrialization intensity. The share of manufactures in total exports captures the role of manufacturing in export activity. The *share of medium- and high-technology products* captures the technological complexity of exports, along with the ability to make more advanced products and move into more dynamic areas of exports.

All indicators are standardized according to the following formula:

$$I_{i,j} = \frac{X_{i,j} - Min(X_{i,j})}{Max(X_{i,j}) - Min(X_{i,j})}$$

Where $X_{i,j}$ is the index value *i* of country *j*, *Min* is the smallest value in the sample and *Max* the largest. The top performing country in the sample gets the value 1 while the worst performing country gets the value 0. The combined index is calculated as the arithmetic mean of the standardized values of the indicators. All six dimensions of the CIP index are given equal weight. In the last two dimensions (industrialization intensity and export quality), each indicator also gets an equal weight, which results in half the weight given to the other indicators in the overall aggregation model.

Source: UNIDO

Table 1: Ranking of countries in the CIP index, 2005-2009

Ranking		Country or Territory	CIP Index	
2005	2009		2005	2009
3	1	Singapore	0.631	0.642
2	2	United States of America	0.660	0.634
1	3	Japan	0.661	0.628
4	4	Germany	0.598	0.597
6	5	China	0.461	0.557
7	6	Switzerland	0.455	0.513
9	7	Republic of Korea	0.438	0.480
5	8	Ireland	0.499	0.479
11	9	Finland	0.411	0.442
8	10	Belgium	0.439	0.442
12	11	China, Taiwan Province	0.401	0.437
10	12	Sweden	0.432	0.430
18	13	Austria	0.368	0.401
21	14	Slovakia	0.322	0.387
13	15	France	0.395	0.384
16	16	Netherlands	0.374	0.378
14	17	China, Hong Kong SAR	0.385	0.375
17	18	Italy	0.370	0.361
15	19	United Kingdom	0.383	0.356
24	20	Czech Republic	0.310	0.352
26	21	Slovenia	0.306	0.345
30	22	Israel	0.286	0.332
25	23	Hungary	0.310	0.328
22	24	Luxembourg	0.316	0.323
27	25	Thailand	0.300	0.320
23	26	Denmark	0.311	0.320
20	27	Malaysia	0.330	0.320
19	28	Canada	0.349	0.309
28	29	Spain	0.293	0.291
29	30	Mexico	0.286	0.286
31	31	Malta	0.266	0.284
34	32	Poland	0.235	0.279
32	33	Philippines	0.262	0.272
38	34	Norway	0.209	0.248
33	35	Turkey	0.237	0.237
35	36	Estonia	0.220	0.234
36	37	Portugal	0.218	0.224
43	38	Iceland	0.187	0.218
47	39	Romania	0.178	0.218
41	40	Lithuania	0.196	0.216
39	41	Costa Rica	0.208	0.215
42	42	India	0.190	0.206
40	43	Indonesia	0.198	0.203
37	44	Brazil	0.212	0.202
51	45	Jordan	0.167	0.193
49	46	Argentina	0.168	0.192
46	47	Australia	0.180	0.188
62	48	Swaziland	0.152	0.186
45	49	South Africa	0.181	0.184
52	50	Greece	0.166	0.182
58	51	Georgia	0.155	0.179
61	52	Latvia	0.154	0.178
44	53	Cyprus	0.182	0.176
53	54	Bulgaria	0.165	0.176
54	55	Tunisia	0.157	0.175
50	56	El Salvador	0.168	0.175
55	57	Barbados	0.156	0.174
72	58	Viet Nam	0.137	0.171
59	59	Morocco	0.155	0.168
64	60	Qatar	0.150	0.168
48	61	New Zealand	0.172	0.161
73	62	Egypt	0.137	0.157
67	63	Pakistan	0.147	0.156
88	64	Kuwait	0.107	0.156
60	65	Bahamas	0.154	0.154
57	66	Russian Federation	0.155	0.154
63	67	Trinidad and Tobago	0.151	0.151
66	68	The f. Yugosl. Rep of Macedonia	0.147	0.149
75	69	Bangladesh	0.135	0.145
56	70	Mauritius	0.156	0.144
65	71	Lebanon	0.149	0.144
78	72	China, Macao SAR	0.130	0.142
76	73	Jamaica	0.132	0.141
69	74	Colombia	0.140	0.135
68	75	Senegal	0.142	0.134
77	76	Albania	0.132	0.133
71	77	Venezuela (Bolivarian Republic of)	0.138	0.131
79	78	Botswana	0.128	0.131
80	79	Uruguay	0.123	0.129
101	80	Syrian Arab Republic	0.082	0.128
70	81	Chile	0.139	0.128
89	82	Saint Lucia	0.106	0.127
82	83	Iran (Islamic Republic of)	0.114	0.126
87	84	Republic of Moldova	0.111	0.126
97	85	Gambia	0.087	0.124
83	86	Palestinian Territories	0.114	0.121
90	87	Rwanda	0.106	0.119
93	88	Cambodia	0.102	0.119
92	89	Honduras	0.103	0.118
74	90	Côte d'Ivoire	0.136	0.116
99	91	Oman	0.087	0.115
86	92	Sri Lanka	0.111	0.115
94	93	Fiji	0.101	0.110
91	94	Nepal	0.105	0.108
85	95	Niger	0.111	0.107
96	96	Peru	0.094	0.106
100	97	Madagascar	0.086	0.101
105	98	Uganda	0.075	0.100
84	99	Zimbabwe	0.114	0.100
97	100	Kenya	0.092	0.094
101	101	Kyrgyzstan	0.085	0.089
103	102	Cameroon	0.080	0.083
81	103	Nigeria	0.114	0.081
108	104	Ecuador	0.069	0.079
104	105	Paraguay	0.075	0.076
107	106	Eritrea	0.071	0.076
111	107	Bolivia (Plurinational State of)	0.063	0.073
112	108	Mongolia	0.055	0.070
109	109	Ghana	0.069	0.069
114	110	United Republic of Tanzania	0.046	0.068
118	111	Ethiopia	0.017	0.068
110	112	Malawi	0.064	0.059
113	113	Panama	0.048	0.053
116	114	Yemen	0.036	0.044
115	115	Algeria	0.037	0.042
117	116	Gabon	0.034	0.038
106	117	Azerbaijan	0.072	0.036
95	118	Sudan	0.095	0.035

Source: UNIDO, Industrial Development Report 2011

relative to a selection of country comparators. The CIP index captures six different dimensions of industrial performance, using eight discrete indictors (described in Box 2).

Each indicator provides a useful description of one aspect of industrial competitiveness which are all analysed individually in Section B of this report. These measures are weighted and condensed into a single aggregated score. UNIDO publishes the CIP index in its flagship report, the *Industrial Development Report*, benchmarking 118 countries in the world.

Table 1 presents the country rankings in the CIP index for 2005 and 2009 published in UNIDO's Industrial Development Report 2011. The general stability of the ranking positions over time demonstrates that economic transformation and structural change is a path-dependent process that takes time (most countries have experienced only limited changes, moving three positions or less). Leaps are nevertheless possible and reflect responses to major improvements or deterioration in the basic conditions of industrial activity between 2005 and 2009.

Tanzania's low rank (110) suggests that there is plenty of room for improvement of the country's industrial competitiveness vis-à-vis more successful international (e.g. Malaysia, China) and regional (e.g. South Africa, Kenya) comparators. Nevertheless, the fact that Tanzania moved up four ranks between 2005 and 2009 indicates that a catch-up process has been initiated in the last years. The following analysis of the individual dimensions of industrial competitiveness will shed more light on this finding. This disaggregated analysis of the various industry and trade indicators will present a more nuanced picture of Tanzania's industrial competitiveness.

3.2 Manufacturing value added (MVA) performance

Tanzania's steady GDP growth is well recognized, yet concerns over employment levels and poverty reduction persist. Our analysis attempts to unravel the productive contribution of manufacturing to this growth episode – following the logic that industrial development is a key driver of economic growth in the early stage of a country's economic growth and development process. Manufacturing value added (MVA) is a key indicator to capture the sector's depth and the existence of industry-specific capabilities at the firm level.

Tanzanian MVA is on a growth path

Tanzania's MVA has grown significantly in the last decade. Between 2000 and 2010, MVA increased from US$ 894 million to US$ 1,992 million in constant US$ 2000 terms (see Table 2). What is remarkable is the stability of the country's growth trajectory. The growth rates in the first and second half of the decade were above 8 percent per year, outpaced only by China and Mozambique. At the same time, MVA growth has been complemented by economic growth. China, Mozambique, Uganda and Tanzania had the highest GDP growth rates for the period 2000-2010 (10.5 percent, 7.8 percent, 7.4 percent and 7.0 percent, respectively), implying that there is indeed a strong link between industrialization and economic development.

Despite this performance, the relevant question is whether Tanzania can sustain this growth trend, especially if it continues to focus on natural resource-based activities. In this regard, it must be mentioned that the value addition from metals and other extractive industries is still very limited. Accordingly, one sensible strategic option for the country is to upgrade within this important sector and to thus move into higher value added activities. This is in line with the idea that the structural change necessary for improving a country's economic development has to take into account the comparative and competitive advantages of the country. This does not always imply that a major shift from low-technology to high-technology manufactures is needed. In particular, for countries at an early stage of industrialization, structural transformation can start within well-established sub-sectors. Increasing value addition through enhanced processing in natural resource-based industries could, therefore, be a possible starting point for Tanzania.

For a complete picture of Tanzania's MVA performance in relative terms, it is necessary to take the country's size into account. Applying a capacity indicator to MVA, the industrial base of Tanzania remains one of the lowest in the world with an MVA per capita of only US$ 44 in 2010, despite a growth rate of 5 percent per annum since 2000 (Table 3). This growth has enabled Tanzania to overtake Zambia and to substantially reduce the gap to Kenya in MVA per capita terms. However, from a global perspective, this comparison shows that MVA growth in Tanzania is less impressive than it appears at first glance. In fact, the group of East African neighbours remains quite far behind their more industrialized comparators. For instance, South Africa as the main reference point for countries in the region has an MVA value far above that of Kenya or Tanzania.

Table 2. Manufacturing value added for Tanzania and comparators, 2000-2010 (ranked by growth rate)*

Country	Manufacturing value added (constant US$ 2000 million)			Annual growth rate (%)		
	2000	2005	2010	2000-2005	2005-2010	2000-2010
China	384,942.3	630,818.5	1,115,270.8	10.4%	12.1%	11.2%
Mozambique	452.3	896.6	1,017.4	14.7%	2.6%	8.4%
Tanzania	894.1	1,318.3	1,991.7	8.1%	8.6%	8.3%
Uganda	439.7	591.4	834.2	6.1%	7.1%	6.6%
Zambia	329.4	420.4	549.8	5.0%	5.5%	5.3%
Indonesia	45,785.8	58,367.9	70,687.4	5.0%	3.9%	4.4%
Botswana	245.7	293.2	368.3	3.6%	4.7%	4.1%
Kenya	1,309.2	1,522.5	1,882.2	3.1%	4.3%	3.7%
Malaysia	28,946.8	36,300.0	40,694.8	4.6%	2.3%	3.5%
Malawi	202.6	152.6	271.0	-5.5%	12.2%	3.0%
South Africa	22,926.7	26,678.2	28,849.6	3.1%	1.6%	2.3%
Mauritius	941.0	910.8	1,041.8	-0.6%	2.7%	1.0%

Source: World Development Indicators

* This table compares the MVA growth performance of the comparator countries and, accordingly, shows the MVA data in constant US$ 2000 values. It must be noted that values in constant US$ are more suitable for comparisons of only one year and do show different values. For example, in constant US$ terms, Kenyan MVA in 2010 amounted to US$ 3,213 million, which indicates a substantially higher level of industrial development than Tanzania's US$ 1,998 million in the same year.

Table 3. Manufacturing value added per capita for Tanzania and competitors, 2000-2010*

Country	Annual growth rate 2000-2010	Manufacturing value added per capita (constant US$ 2000)	
		2000	2010
Malaysia	1%	1236.26	1432.87
China	11%	304.87	833.35
Mauritius	0%	792.84	813.23
South Africa	1%	521.06	577.10
Indonesia	3%	214.56	294.69
Botswana	3%	139.76	183.51
Kenya	1%	41.89	46.46
Tanzania	5%	26.27	44.42
Mozambique	6%	24.85	43.50
Zambia	3%	32.29	42.53
Uganda	3%	18.16	24.96
Malawi	0%	18.04	18.19

Source: World Development Indicators (South Africa values for 2000-2009)

*For the same reason as in Table 2 above, this table uses MVA in constant US$ 2000 terms to calculate the MVA per capita indicator. In current US$ terms, the gap between Kenya and Tanzania is still more significant in 2010, despite the faster growth path of Tanzania in the last 10 years.

To put this difference into context, a telling projection of Tanzania's catching-up process can be made: if Tanzania were to maintain its current MVA growth levels, it would take 45 years to reach the current level of South Africa (if South Africa remains at its 2010 level). If South Africa continues to grow at its current speed, Tanzania will be 66 years behind in terms of catching up based on it its current level of MVA per capita. While current MVA growth in Tanzania is impressive, it is insufficient to close the gap to the next tier of countries within one or two generations.

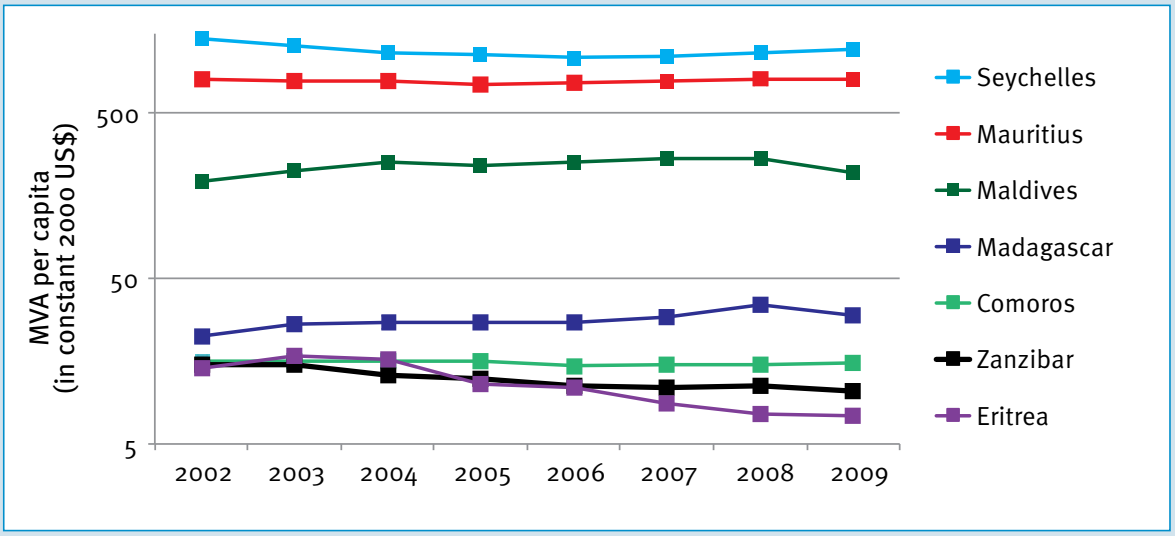
Box 3: Benchmarking Zanzibar's industrial performance*

The selection of suitable benchmarks for Zanzibar must obviously differ from those of the URT. Accordingly, members of the inter-organizational group of analysts who prepared this report agreed that the benchmarks for Zanzibar ought to be selected on the basis of similar geographical attributes (e.g. small island economies) as well as comparable country size (in terms of land, population and economy). An analysis of the level of industrialization (proxied by MVA per capita) of Zanzibar and a number of comparators leads to the following findings (Figure 5):

- Zanzibar is less industrialized than the URT on the whole, with an MVA per capita value of only US$ 10 compared to US$ 44 for the URT.
- Zanzibar's level of industrialization deteriorated by an average -5 percent per annum from US$ 15 per capita in 2002, due to a decline in value addition in the face of a significant increase in population.
- Madagascar and Comoros appear to be suitable benchmarks for direct comparisons and case study investigations, as they are at a similar stage of industrialization as Zanzibar but have recently shown a better competitive performance (in particular Madagascar).
- Seychelles and Mauritius (and Maldives) share several characteristics with Zanzibar, but have reached a more advanced stage of industrialization and could, hence, act as role models that provide long-term objectives for Zanzibar's manufacturing growth path.

While the deterioration of Zanzibar's industrial competitiveness is the result of several serious constraints, the transition from a centralized to a liberalized economy, the hesitancy of local entrepreneurs towards risk taking associated with manufacturing and the weak outreach of local manufacturing companies to global markets are key factors.

Figure 5 : Industrialization level of Zanzibar and comparators, 2002-2009



Source: WDI and OCGS Zanzibar

* The TICR 2012 presents a detailed analysis of the industrial performance of the United Republic of Tanzania vis-à-vis a selection of comparator countries. However, the competitiveness of the URT is essentially an aggregation of the respective performance of all the individual regions it consists of. Accordingly, industrial policy measures aimed at improving the competitive position of Tanzania's industry will have to be location-specific. Due to the lack of available data in the URT regions, it is not yet feasible to bring the full industrial performance analysis and the CIP index to the meso level. However, with some available quantitative evidence for Zanzibar, it is possible to shed additional light on some key aspects.

Table 4: Manufactured exports for Tanzania and comparators, 2000-2010

Country	Manufactured exports (US$ million)			Annual growth (%)		
	2000	2005	2010	2000-2005	2005-2010	2000-2010
Tanzania	129	292	1,904	18%	45%	31%
Uganda	30	120	401	32%	27%	30%
China	228,407	722,628	1,518,587	26%	16%	21%
Zambia	310	529	1,408	11%	22%	16%
Malawi	68	126	294	13%	19%	16%
Kenya	586	1,988	2,525	28%	5%	16%
Rwanda	22	42	93	14%	17%	15%
Mozambique	60	207	172	28%	-4%	11%
South Africa	18,355	32,465	48,842	12%	9%	10%
Indonesia	42,990	55,118	94,804	5%	11%	8%
Malaysia	87,643	120,622	165,590	7%	7%	7%
Botswana	2,654	4,254	4,398	10%	1%	5%
Ghana	477	1,079	653	18%	-10%	3%
Mauritius	1,457	1,368	1,424	-1%	1%	0%

Source: UN Comtrade (Rwanda values for 2001-2010)

3.3 Manufactured export performance

Over the last few decades, the rules of the global economy have changed considerably with trade liberalization and the integration of national economies being the main characteristics. Manufactured trade has grown faster than MVA in recent years due to the fragmentation and internationalization of industrial activity.

While manufacturing value added is the key indicator of industrial performance, manufactured export is another important indicator used to assess industrial competitiveness in global markets. Take, for instance, the case of a highly protected economy. Inward-looking policies may distort the real competitive performance of a country as industries are not exposed to international competition and imports are restricted. It is therefore necessary to complement MVA analysis with some indicators of international competitiveness.

Tanzania has experienced rapid manufactured export growth

Tanzania has recorded the highest growth rate in manufactured exports (31 percent per annum) among the comparators from 2000-2010, growing from US$ 129 million to US$ 1,904 million (see Table 4). It is important to mention that this significant increase mainly took place in the second part of the decade (45 percent per annum between 2005 and 2010) despite the financial crisis which negatively affected the export performance of most economies in the world, including China and Kenya.

Notwithstanding the good growth performance of Tanzania's manufactured exports, it must be noted that nearly half of the country's manufactured exports in 2010 were resource-based products (mostly base and precious metal ore)[4]. Hence, Tanzania's manufactured trade performance is not as impressive as it seems at first glance. In fact, the current reliance of industrial growth on a few products that have low value addition and high price fluctuation calls for measures to diversify the export basket to lower the economy's vulnerability and to sustain growth.

To evaluate this impressive growth performance, caution is also warranted when interpreting the growth rates. Countries with a small export base (e.g. Tanzania)

4 The world market prices for several resource-based manufactures, including precious metal ores has skyrocketed in the last decade. This was a key driver for export growth in Tanzania.

Table 5. Manufactured exports per capita for Tanzania and comparators, 2000-2010

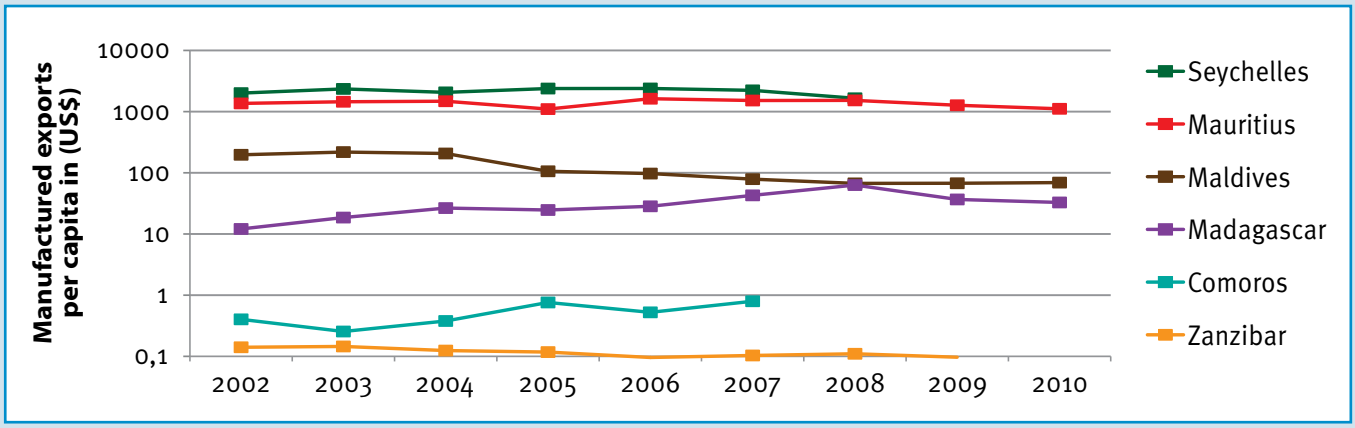
Ranking		Country	Value (US$ per capita)	
2000	2010		2000	2010
1	1	Malaysia	3,743	5,830
2	2	Botswana	1,509	2,191
6	3	China	180	1,134
3	4	Mauritius	1,227	1,111
4	5	South Africa	417	977
5	6	Indonesia	201	395
7	7	Zambia	30	108
9	8	Kenya	18	62
11	9	Tanzania	3	42
8	10	Ghana	24	26
10	11	Malawi	6	19
14	12	Uganda	1	12
13	13	Rwanda	2	8
12	14	Mozambique	3	7

Source: UN Comtrade and World Development Indicators

Box 4: Benchmarking Zanzibar's industrial exports

An analysis of Zanzibar's performance in manufactured exports clearly indicates that it is not yet participating in the dynamic world market for industrial goods. In fact, the archipelago's manufactured export volume declined from US$ 133,000 to US$ 113,000 between 2002 and 2009. This represents one of the lowest per capita levels of less than US$ 1, when discounted by the population size of roughly 1.2 million inhabitants. Accordingly, most other small island economies that were selected as benchmarks clearly outcompete Zanzibar in terms of manufactured export capacity. This implies that manufacturing entails significant unused potentials to contribute to Zanzibar's economic development process. By strengthening the export competitiveness of selected manufacturing sectors (e.g. resource-based manufacturing), Zanzibar could eventually follow the recent substantial expansion of Madagascar's industrial sector which today displays a manufactured export capacity of US$ 33 per capita. In addition, the tremendous success of Mauritius and Seychelles, which both record capacities of more than US$ 1,000 per capita, proves that small island economies like Zanzibar have the potential to extensively participate in global markets for manufactures. However, given the serious current challenges, Zanzibar will need to actively promote its manufacturing sector over a substantial period of time to tap into these potentials.

Figure 6: Manufactured export capacity of Zanzibar and comparators, 2002-2010



Source: UN Comtrade and OCGS Zanzibar

may show very high growth rates at the beginning of the period through a relatively small absolute increase. Furthermore, in order to derive findings on the manufactured export capacity of Tanzania and its comparators, it is necessary to adjust this analysis by country size.

Tanzania's manufactured exports per capita are still quite limited, increasing from US$ 3 per capita to US$ 42 per capita between 2000 and 2010. This export performance has, however, enabled Tanzania to overtake Ghana and Malawi and to reduce the gap to Kenya. The distance to African comparators like South Africa or Mauritius is still considerable, and Tanzania's growth would need to be sustained for many years to even come within reach of the levels of lower middle-income countries such as Indonesia (see Table 5).

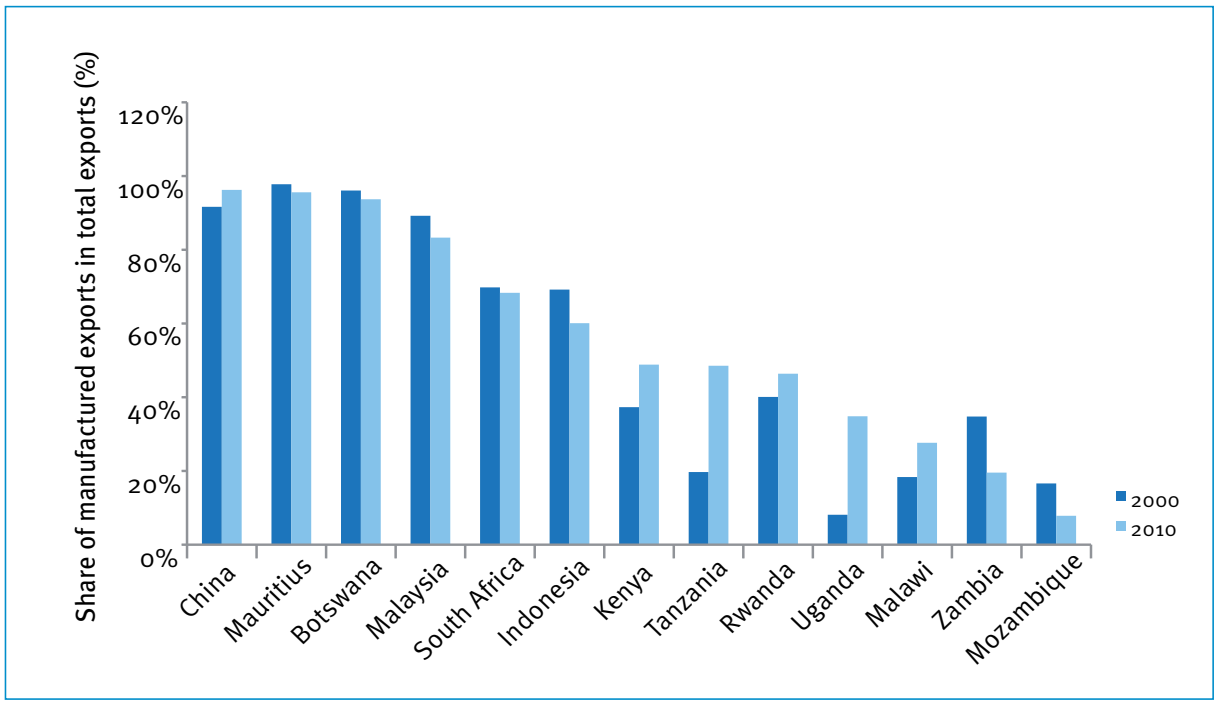
What does manufactured export growth mean for Tanzania?

Engagement in export markets means greater opportunity for Tanzanian producers. As discussed above, the increased extraction of metals and higher world market price have driven manufactured export growth. Access to markets should act as a catalyst to create more opportunities for domestic industry and producers and to generate jobs within manufacturing as well as manufacturing related services.

From an economic perspective, Tanzania's current export and MVA performance contribute to overall GDP growth. The major risk of the current trend is that despite the strong growth rates, its effect on inclusive development and employment generation is questionable. In particular, the potential for skills learning, technology transfer, innovation and employment absorption of mineral extraction-based exports will be an important consideration as Tanzania becomes a more established exporter. The discussions in Section C attempt to highlight the opportunities for Tanzanian industry in more detail, and also argue how resource-based exports can be utilized to support further industrialization.

As far as Tanzania's export structure is concerned, a positive story is starting to emerge. Tanzania has more than doubled the share of manufactured goods within exports in the last decade. In 2010, manufactured products made up nearly 50 percent of all exports. However, there is a significant gap in comparison with more industrialized countries. For instance, in China and Mauritius, this share is more than 96 percent, reflecting their role in serving the huge global demand for manufactured products. In comparison with countries that are at a similar stage of development, Tanzania has succeeded in catching up with Kenya in this respect, while overtaking Rwanda and Zambia.

Figure 7. Manufactured exports in total exports for Tanzania and comparators, 2000-2010



Source: UN Comtrade (Rwanda values for 2001-2010)

This is a positive indication of a deepening process in Tanzania's export structure, which is an important aspect of industrial competitiveness and is explored in more detail in the following sub-section.

3.4 Structural change

Orthodox economic theory suggests that countries' production and trade structures are only determined by factor endowments. However, evidence has shown that this approach fails to explain the current patterns of the world economy. New research reveals that externalities and learning effects derived from sectoral specialization do matter, and that shifts between activities do not occur automatically and at no cost. Consequently, factor endowments are important but national capabilities and the growth potential of sectors are crucial for determining what a country would need to produce and export to achieve the desired development.

This finding has several implications for policy design and implementation, and it is not surprising that the debate on structural change is back on the national development agendas of most developing countries. The fact that governments need to determine in advance which sectors to target to achieve their respective development objectives must be highlighted. This sectoral selection varies from country to country because it depends on the economies' national priorities. The criteria commonly used for this prioritization include job creation, poverty reduction, import substitution, export competitiveness, industrial backward and forward linkages, foreign exchange generation, etc.

Structural change matters for industrial competitiveness

Structural change is one of the central concepts of industrial development and is not easy to achieve. According to the theory, structural change can take many forms. In its broadest conception, structural change is described as the shift from primary activities towards manufacturing excellence, both in production and trade. But structural change can also take place within manufacturing.

Changes in the structure of the national economy from an agricultural towards a semi-industrialized economy bring benefits. First, evidence has shown that industrialization is strongly linked to economic growth, and manufacturing can play an important role in transforming the economic structure of agro-dependant countries. Second, it can lower a country's vulnerability since commodities are highly exposed to major price changes, high fluctuations in world demand, climatic conditions and unfair competition policies. Third, industrial activities generate more backward and forward linkages with other sectors of the economy. Fourth, manufacturing production requires more specialized human skills, technology innovation and learning, and therefore induces the country to invest in such capabilities. Fifth, productivity grows faster in manufacturing sectors than in agriculture. Finally, manufactured trade accounts for the bulk of world exports and is less exposed to external shocks.

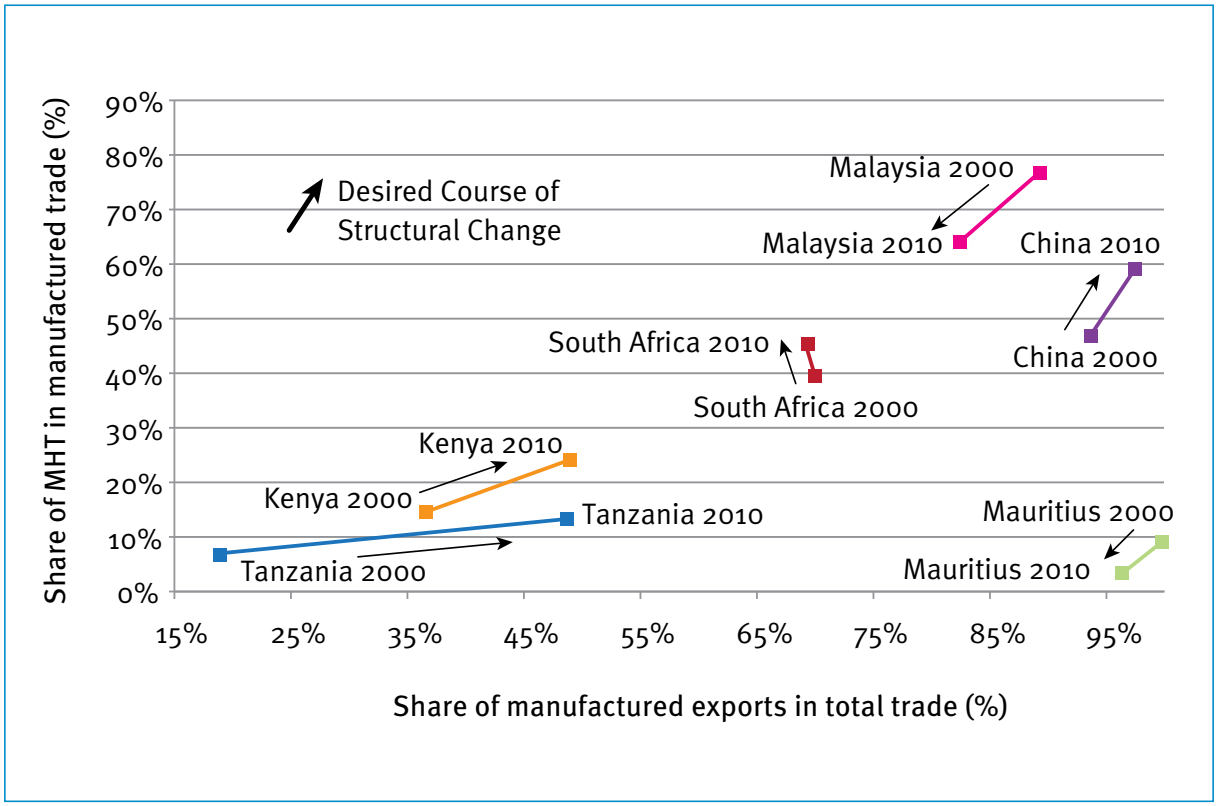
As mentioned before, shifts can also take place within the manufacturing structure from resource-based and low-tech sectors towards more sophisticated medium- and high-technology manufactures. High value-added, high-technology manufacturing can offer greater development benefits for a number of reasons: 1) they grow faster in trade and account for a higher share in total manufactured trade, 2) they are less vulnerable to entry by competitors and ensure more sustainable margins, and 3) they offer higher learning and productivity potential.

However, for countries like Tanzania, where 24 percent of the economic structure is based on agriculture and 44 percent on services, moving towards the production of high-technology products may be unrealistic in the short run. Hence, a possible strategy for Tanzania could be an increase in the share of manufacturing activity in total GDP, which in 2010 was only 9 percent. This can be achieved through the production of more resource-based and low-technology (labour-intensive) products with a higher degree of domestic value addition. Meanwhile, to achieve the government's objective of transforming the nation into a middle income country by 2025, Tanzania will have to create sector-specific capabilities at the policy, institutional and firm level that are necessary for the forthcoming stages of structural change. In particular, it will need to actively promote the structural transformation of the economy to be able to engage in the production and export of medium- and high-technology products in the long run.

Moving towards more sophisticated products

The first part of this section analyses the structural change of Tanzania and its comparators from a trade perspective. The indicators used to assess the countries' performance are explained in detail in Box 2. The first indicator is the share of manufactured exports in total exports, which captures the role of manufacturing in all export products, and the second

Figure 8. Sophistication of export structures and changes, 2000-2010



Source: UN Comtrade

one is the share of medium-high technology products in total manufactured trade, which captures the technological complexity of exports along with the ability to manufacture more advanced products and move into more dynamic areas of exports.

The desirable course towards higher industrial competitiveness is an increase in exports of manufactured products within the country's overall export structure and the focus on medium-high technology levels within manufacturing. Nevertheless, this may not be the ideal pattern for Tanzania to follow in the short run, since the government's main objective is to boost the overall manufacturing sector by strengthening resource-based and low-technology (labour-intensive) products.

Figure 8 shows that Tanzania started with a very low base of manufacturing exports, but has made considerable progress along both dimensions of structural change in the last decade. Specifically, Tanzania achieved a marked increase in the share of manufactures in total exports from 19.7 percent in 2000 to 48.5 percent in 2010. An analysis of the specific products accounting for this change suggests that the manufacturing of gold and steel products has primarily been responsible for this development[5]. While this has inflated the share of manufactures, there have been more encouraging signs.

In particular, medium-tech export growth propelled the share of more sophisticated products in manufactured exports, which increased from 7.3 percent to 13.6 percent between 2000 and 2010. This change is much smaller relative to the overall increase of the share of manufactures in total exports, but nonetheless signals a deepening of the Tanzanian export structure.

In comparison to others, Tanzania's performance is very dynamic. Kenya has also achieved progress along both dimensions and remains ahead of Tanzania in terms of quality of manufactured exports – Kenya has a higher share of medium- and high-tech exports. However, Tanzania has closed the gap significantly in terms of share of manufactures during the last decade. At the same time, South Africa has moved towards manufactured exports with higher technology

5 UNIDO's technology classification for manufactured exports includes a range of natural resource-based products as 'resource-based manufactures' which in some cases undergo only a relatively small amount of processing. This internationally comparable statistical definition leads to a relatively high share of manufactured exports in total exports compared to other classifications that have been used in Tanzania in the past.

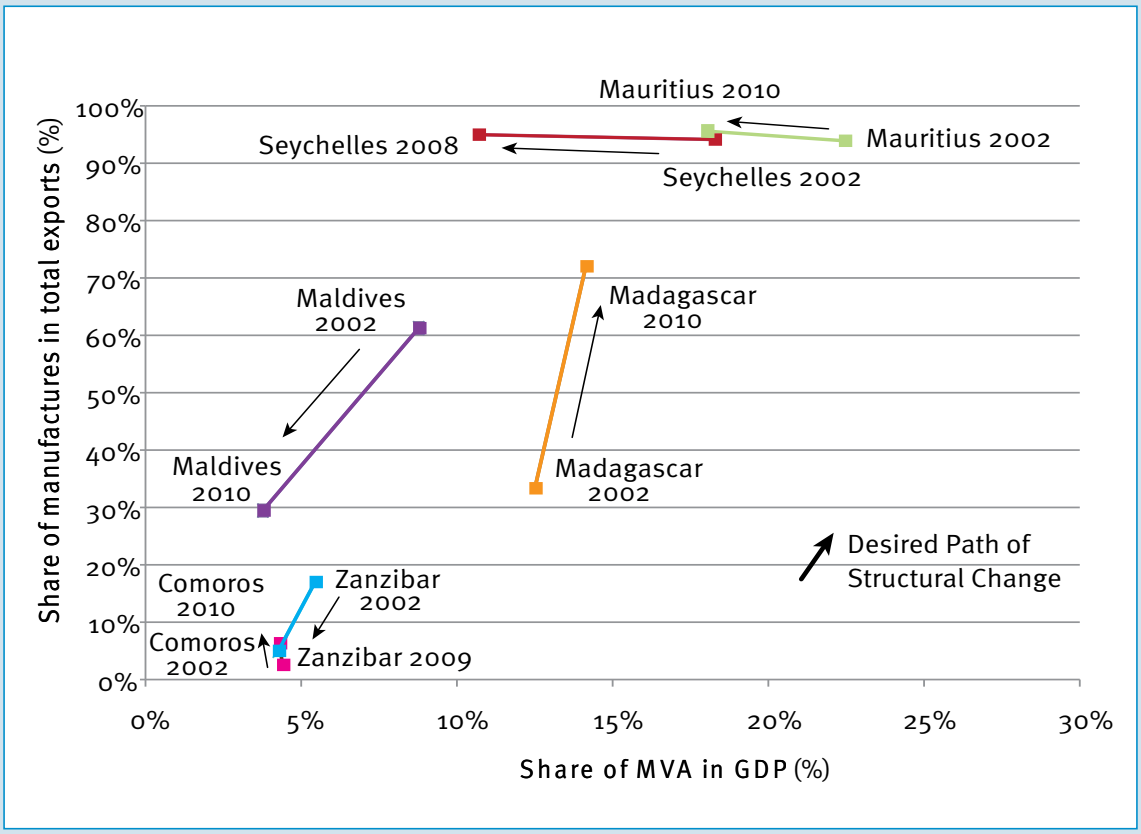
Box 5: Structural change in Zanzibar

While structural change in Tanzania has shown some positive signs in the last decade, Zanzibar has not yet managed to initiate a shift towards industry-led development. A comparison of the structural change process vis-à-vis selected comparators provides the following findings:

- Manufacturing value added has stagnated at less than 5 percent of GDP over the last decade.
- On the trade side, manufactures today account for less than 5 percent of total exports. This indicates a failure to diversify and shift from exporting primary agricultural products.
- While a substantial increase of export volumes has been achieved in the primary commodity sector (e.g. cloves), manufactured trade did not show any expansion, bringing its relative share down from almost 17 percent in 2002.
- Other small island economies have recorded huge successes in transforming their economies and industrialization. In particular, Mauritius and Seychelles are highly engaged in both manufacturing value addition and exports. More recently, Madagascar has also relied on its manufacturing sector as a key driver of economic growth.

In a nutshell, the first stage of structural change has not yet been reached in Zanzibar. Agriculture and services (tourism) are still the key economic activities, while manufacturing does not yet play a significant role in economic growth and employment generation. Given the large role of exports of raw spices, increased value addition in that sector could present a starting point for diversification. A shift towards more technology-intensive manufactures is clearly less relevant in the short run.

Figure 9: Structural change of Zanzibar and comparators, 2002-2010



Source: UN Comtrade, WDI and OCGS Zanzibar

Box 6: Structural change in Mauritius

Since independence in 1968, Mauritius has developed from a low-income, agriculturally based economy to a middle-income diversified economy with growing industrial, financial and tourist sectors. Today, Mauritius has a high level of manufacturing, yet a low level of medium-high-tech manufacturing. Mauritius has successfully managed to specialize as a hub of high quality textile manufacturing

For most of the period, annual growth has been in the order of 5 percent to 6 percent. This remarkable achievement is reflected in a more equitable income distribution, increased life expectancy, lowered infant mortality and much improved infrastructure.

This structural change was achieved after 1971, when an Export Processing Zone (EPZ) was created to tackle the country's rampant unemployment. Mauritius's so-called "economic miracle" is largely due to the growth of the manufacturing sector through the EPZs, which attracted significant investment domestically and from abroad, as foreign companies looked for cheaper locations for production. Clothing and textiles still form the mainstay of Mauritian industry and dominate the EPZ sector - along with sugar processing - Mauritian clothing and textiles are also internationally competitive, both in terms of price and quality.

The successful industrialization of the Mauritian export structure was important in supporting widespread economic development, and income per capita in Mauritius is now greater than US$ 4,000. Attempts have been made with limited success to attract more sophisticated industry for high-tech products. While structural change towards greater processing has been a successful strategy for Mauritius, a gap remains to countries like Malaysia that have successfully climbed the ladder to more sophisticated manufactures. Nevertheless, the Mauritian success of mastering the first stage of structural change towards a high share of manufacturing can guide current Tanzanian initiatives aiming to achieve the same objective.

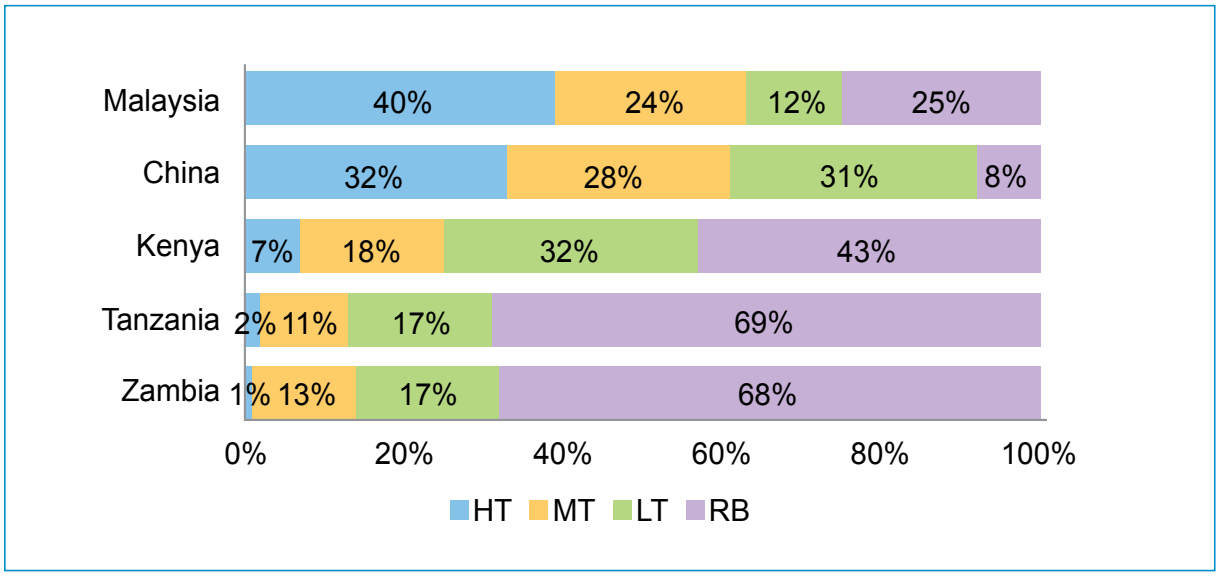
intensity, while China, whose exports were already predominately manufactured goods ten years ago, has also continued to move into higher-technology sectors. This comparison shows that Kenya is clearly the most immediate competitor with a fairly similar industrial export pattern as Tanzania. Both countries are currently facing the challenges of the first stage of structural change in which they are trying to strengthen their manufacturing sector vis-à-vis primary commodity exports. South Africa, Mauritius and the East Asian comparators have already entered the second stage of structural change. This also implies that Kenya's industrial development path is a suitable case study for Tanzania to derive lessons from in the short run (e.g. with regard to the shift from traditional agriculture to agro-processing industries) while more advanced countries can provide valuable insights for the medium- and long term in the area of technological upgrading, innovation and industrial skill development. In Zanzibar, structural change is still at a much earlier stage, suggesting that regional imbalances are another dimension to consider during the envisioned socio-economic transformation of URT (Box 5).

In the short- to medium term, the main challenge for Tanzania will be to consolidate the changes already attained (the high share of manufactured exports in total exports), and to foster a transition from its reliance on low value-added, resource-based manufactures and low-tech manufactures towards high value-added, resource-based manufactures and low-technology products. The structural change experience of Mauritius is an interesting case study in this regard (Box 6).

Figure 10 presents the structural composition of Tanzanian manufactured exports vis-à-vis some comparator countries in 2010. It is obvious that the structure of both Tanzania and Zambia differ considerably from the structure of more developed nations such as Malaysia and China. The share of medium-tech manufactures in the export mix is clearly a positive signal. In 2000, this share accounted for only 4 percent of manufactured exports in Tanzania, but has risen steadily to reach 11 percent in 2010.[6]

6 Although this increase of the share of medium-technology products looks very promising at first glance, the disaggregation of the medium-technology category into individual product groups points to a single product category that accounts for the largest part of this increase: manufactured fertilizers. In fact, these manufactured fertilizers largely consist of extracted rock phosphates in packaged form, which do not show a high level of domestic value addition that medium-technology products usually tend to. A more disaggregated analysis of value-addition levels in the respective technology categories (RB, LT, MT, HT) will have to be conducted in the future to understand the dynamics in more depth.

Figure 10: Structure of manufactured exports by technology classification for Tanzania and comparators, 2010



Source: UN Comtrade

How much does industry matter for Tanzania today?
Exports only tell part of the structural change story. It is also worth exploring the manufacturing value added data to truly understand how exports reflect the country's industrial activity. As part of the analysis on structural change, this section assesses the industrial structure and the level of its sophistication for Tanzania and its comparators. For this purpose, the first indicator to be analysed is share of MVA in GDP, which seeks to measure the relevance of manufacturing within the economy.

The data on the share of MVA in GDP (Table 6) illustrates that most comparator countries have maintained their share over the last decade. In fact, most of the countries witnessed a decrease in the importance of the industrial sector in the economy, while only Mozambique, Uganda and Tanzania experienced a small increase between 2000 and 2010. Hence, these were the few economies that successfully experienced substantial MVA growth in line with GDP growth.

In Tanzania, MVA has remained steadfast at around 9 percent of GDP. While MVA has kept pace with the country's growth, it is not a large enough share of the economy yet to be considered a key economic growth driver. According to the Integrated Industrial Development Strategy 2025, the main objective of the Government of Tanzania is "*to transform the nation from a least developed country to a middle income country by 2025 through transformation from a weather and market dependent agricultural economy to a self-sustaining semi-industrialized economy*" (IIDS 2025, 2011). Indeed, one of the targets is to raise the share of MVA in total GDP from 9 percent in 2010 to 23 percent by 2025, which highlights the ambition to use industrialization as a path towards growth and development.

MVA growth can also play an important role in addressing Tanzania's balance of trade by adding value to exports and supplying domestic demand. Furthermore, despite the current level of economic growth – which is largely sustained by commodities and tourism – the potential for employment generation and positive effects on service sector growth is more limited and may be better served by manufacturing.

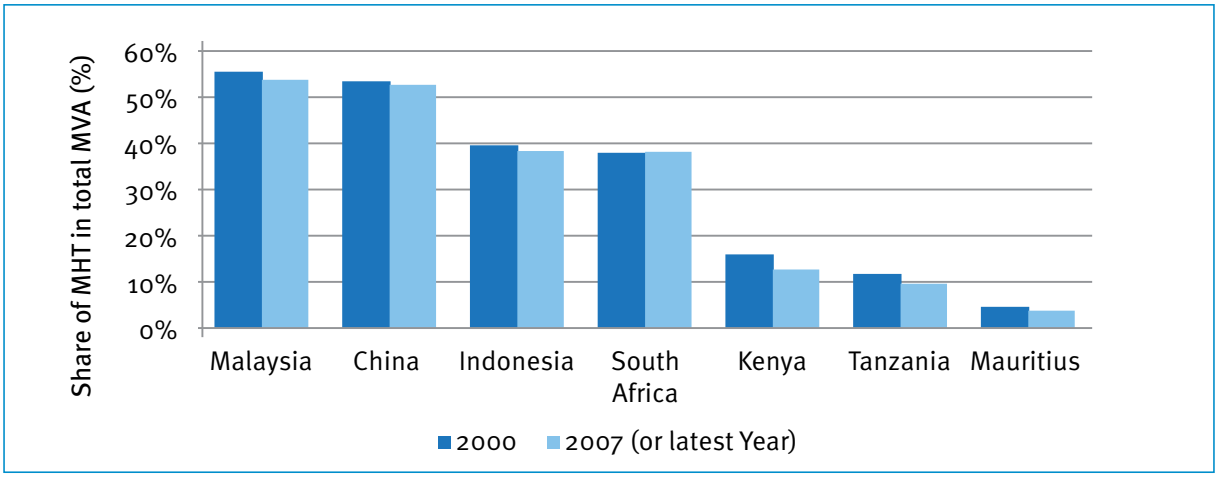
Is Tanzania's manufacturing structure changing?
Manufacturing occurs at different levels of sophistication. Minimal processing of extraction resources or processing of goods using minimal technology is generally associated with a lower level of value addition. Therefore, it is desirable for Tanzania to engage in the production of resource-based and low-technology sectors by adding high value and using more sophisticated technologies and specialized human resources to compete in a better position in the world market. In that sense, resource-based manufactures is an important industrial sector for Tanzania to maximize the rents of their natural resource exports. A sensible strategy for Tanzania in the long term could be to engage in more capital- and knowledge-intensive activities in medium- and high-technology sectors.

Table 6. Share of MVA in GDP, 2000-2010

Country	Share of MVA in GDP %	
	2000	2010
China	32.1%	29.6%
Malaysia	30.9%	26.1%
Indonesia	27.7%	24.8%
Mauritius	23.5%	18.0%
South Africa	19.0%	14.6%
Mozambique	12.2%	13.1%
Kenya	11.6%	11.4%
Malawi	12.9%	10.0%
Tanzania	9.4%	9.6%
Zambia	11.4%	9.2%
Uganda	7.6%	8.3%
Ghana	10.1%	6.8%
Rwanda	7.0%	6.4%
Botswana	4.5%	4.0%

Source: World Development Indicators

Figure 11. Share of medium- and high-tech MVA in total manufacturing value added , 2000-2007 (or latest year)



Source: UNIDO INDSTAT (data for Tanzania and China for years 2003-2007; data for South Africa 2000-2008)

In the case of Tanzania, a very small share of the population is engaged in industrial activities, and the vast majority is employed in agriculture or subsistence trading. The employment potential of labour-intensive, low-tech industry therefore makes this an important sector for policymakers to consider promoting. Currently, value addition in Tanzania is still dominated by low processing of resource-based products – when this is taken into account, the real level of manufacturing decreases even further.

Figure 11 shows the share of medium- and high-tech manufacturing activities in total MVA. Of the countries considered, Tanzania and Mauritius had the least sophisticated manufacturing structure in the last year of analysis. Mauritius' low level of sophistication despite its high MVA per capita figures is attributable to the country's heavy yet successful focus on textiles. Looking beyond Mauritius, Tanzania's sophistication trails far behind Kenya's, and as the graph clearly shows, Tanzania has, in fact, become

less sophisticated over the period. More in depth analysis reveals that resource-based manufacturing today accounts for 79 percent of MVA, with food and beverages alone amounting to 48 percent. Therefore, despite the recent growth in MVA, there is no indication of major structural change in the Tanzanian economy. With the exception of South Africa, a marginal decrease in the share of medium- and high-tech MVA in total MVA is evident among the comparator countries. However, the level of sophistication of East Asian countries' industrial structure, like China's and Malaysia's, is still impressive with more than 50 percent in medium-high-tech activities. In the case of the African comparator countries, it is apparent that medium- and high-technology sectors are still quite underdeveloped. If they create the right factors, these countries can certainly target more sophisticated activities in the long run. South Africa is a good example of how this transition could be realized.

The fact that Tanzania has successfully broadened the medium-tech base of its export structure suggests that this growth was achieved by attaining greater market access for medium-technology products with low value addition rather than changes in production activities. The growth of manufacturing in some sectors (e.g. food and beverages) may also, to a large extent, be concentrated on providing products for consumption on the domestic market.

3.5 Product and market diversification

Diversification is an important aspect of industrialization

Diversification, both of products and of markets, is considered another important element of industrial competitiveness. Imbs and Wacziarg (2003) note a link between the level of diversification and country income level. For a country at Tanzania's stage of development, diversification appears to be particularly pertinent. Several arguments speak in favour of diversification of the export mix in countries with lower levels of technology and skills:

- a shift towards areas with greater potential for value addition,
- a reduction of the risk of the entry of new competitors due to low entry barriers, and
- the potential for skills learning and innovation a more diverse economy provides.

For countries at the higher end of the spectrum, specialization in high value-added and technologically complex sectors may eventually make sense – however, as we consider comparator countries along the development chain, we will discount this for the moment and consider diversification to be a positive outcome. This places emphasis on countries with a steady economic growth to capitalize on production structure diversification and to thereby maximize their gains from productive activities.

This argument is supported by Hausmann and Rodrik (2005), who contend that a broad export base facilitates the establishment of foundations for a globally competitive economy through the entry or attrition of firms based on market demands. Furthermore, Hausmann, Hwang and Rodrik (2006) argue that the type of products exported also has an important implication for countries' development potential, i.e. countries trapped in low-technology and low skills exports of primary goods should seek to engage in new areas which can facilitate development in a more holistic sense. This echoes the argument for structural change made in the preceding section and in Section A. In many ways, product diversity helps to capture another dimension of the ability of countries to move beyond their natural resource endowments. At the same time, this also tells us an interesting story about the precariousness of countries' export structure – as outlined in our presentation of the vulnerability matrix.

Market diversification is equally important, as an over-reliance on a single market has the obvious disadvantage that a reduction in demand can adversely affect the economy more strongly than if this is diluted by more stable demand in other markets. Exporting to more than one country also indicates the country's ability to compete internationally – it lessens the vulnerability to external shocks, declining demand and new competition.

This section intends to describe the level of industrial diversification that Tanzania and its comparators exhibit in both products and markets. This is of particular relevance for Tanzania since we will see that the economy depends on only a few products and its manufactured exports are highly concentrated in a few markets.

3.5.1 Product diversification

Product diversification – characteristics and methodology

Product diversification describes the variety of goods produced by a country for export. Diversification may not necessarily be the right strategy for all countries to follow. In fact, world demand may justify product concentration – it makes no sense to produce different types of goods if there is no world demand or if there is too little of it.

The methodology used in this report analyses the manufactured export structure of each country as well as the world's manufactured export structure. The logic behind this is that if a country's export structure is similar to the world's, then its industry conforms to global demand. Box 7 presents the methodology to calculate the Product Diversification Index (PDI) that will be used to analyse Tanzania's diversification pattern and to benchmark it with the country comparators.

How does Tanzania perform in product diversification?

When benchmarking against our selection of comparators, Tanzania ranked sixth in 2010 among the 14 countries, having gained one position since 2000 (see Table 7). This indicates that Tanzania has recently improved its performance in terms of exporting a product mix that is more in line with world demand. However, by looking at the value of the index, it is obvious that Tanzania still lies far behind the African countries considered to be role models. Both South Africa and Kenya display a substantially more diversified manufactured export pattern which more closely matches world demand than Tanzania's.

In terms of policy implications, in order to recommend which strategy Tanzania ought to follow, we need to analyse which other products are being demanded by the world or region and which Tanzania has the capabilities of producing and exporting or is currently producing but not trading internationally. It is very important for policymakers to keep in mind that the best strategy for a country is always to respond to world demand, but also to ensure that the country is not too vulnerable because its export basket depends on very few products only.

In addition to this finding, Figure 12 presents the share of the top five products in each country's manufactured exports. It illustrates the reliance of the respective countries on their key manufactured products (without taking world demand into consideration). The more

Box 7: Methodology for the Manufactured Product Diversification Index

This methodology was developed by UNCTAD to create a Product Diversification Index (UNCTAD, Handbook of Statistics). However there is one major difference between UNCTAD's version and the one used in this report. The present index only considers diversification of manufactured exports, excluding primary exports and other transactions (it is thus a Manufactured Product Diversification Index).

The Manufactured Product Diversification Index shows the extent to which a country depends on particular products relative to world exports. In other words, it compares a country's export structure with the world's export structure.

The formula used is the following:

$$DX_j = 1 - \frac{\sum \left[h_{ij} - h_i \right]}{2}$$

Where DX is the manufactured diversification index value of country $_j$

Σ is the sum of all values in brackets

h_{ij} is the share of product $_i$ in total manufactured exports of country $_j$

h_i is the share of product $_i$ in total world manufactured exports.

As indicated above, we only consider those manufactured products whose share in a country's total manufactured exports is 0.5 percent or above.

Once the manufactured diversification index values have been obtained, they are standardized following the formula for the calculation of the CIP index. Yet, to obtain a ranking where 1 is best (more diversified) and 0 is worst (less diversified), we have to reverse the value order (i.e. one minus standardized Manufactured Product Diversification Index value).

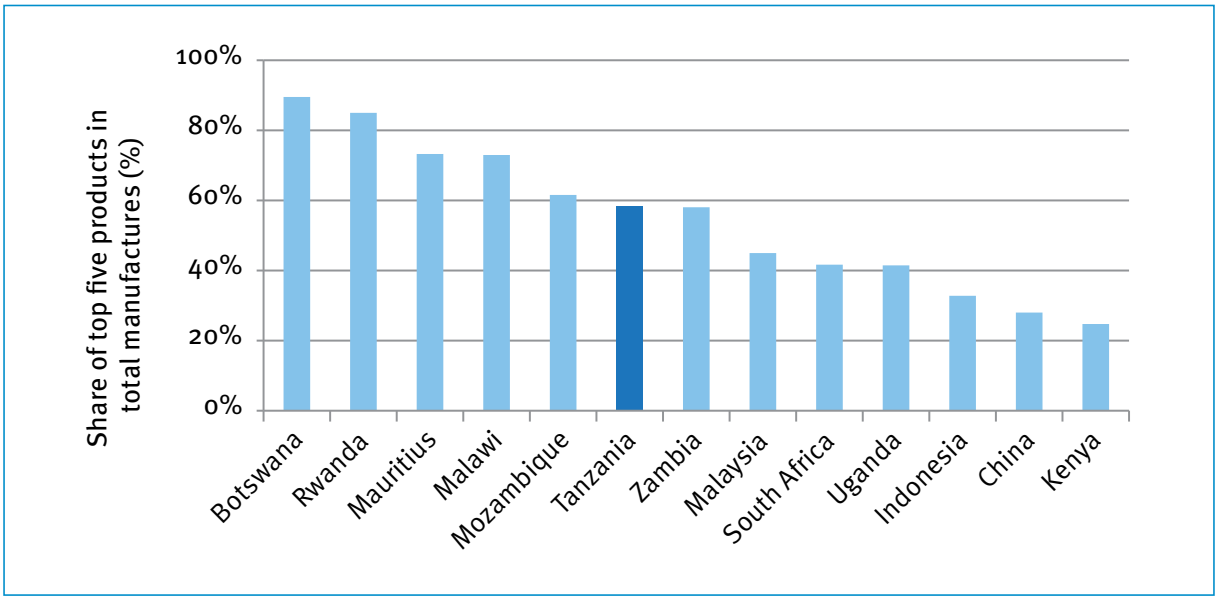
Source: UNIDO

Table 7. Product Diversification Index, 2000-2010

Ranking		Country	Index Value	
2000	2010		2000	2010
1	1	China	0.556	0.603
4	2	Malaysia	0.475	0.520
3	3	South Africa	0.506	0.477
2	4	Indonesia	0.523	0.476
5	5	Kenya	0.289	0.444
7	6	Tanzania	0.203	0.247
8	7	Ghana	0.192	0.239
10	8	Uganda	0.152	0.221
6	9	Mozambique	0.274	0.221
12	10	Zambia	0.129	0.204
9	11	Malawi	0.167	0.202
14	12	Rwanda	0.032	0.128
11	13	Mauritius	0.131	0.126
13	14	Botswana	0.083	0.108

Source: UN Comtrade (Rwanda values for 2001-2010)

Figure 12. Share of top five products in total manufactured exports of selected countries, 2010



Source: UN Comtrade

mature economies of the group – China, Indonesia, South Africa and Kenya – have lower levels of dependence on a small basket of products. Tanzania's situation is similar to that of other African resource-rich countries, like Mozambique and Zambia, where the top five products account for roughly 60 percent of all manufactured exports. With its heavy reliance on diamond exports, Botswana represents a special case in this analysis. On the other hand, Uganda has been quite successful in reducing its dependence on a narrow list of product groups.

3.5.2 Market diversification

Market diversification – characteristics and methodology

Market orientation is determined by a number of factors including geography, infrastructure, trade agreements and policies, nature of foreign firms operating in a country, historical background and, of course, global demand. Policymakers need to consider all these factors to design and implement a trade strategy that fosters the development of links with rapidly growing markets to lock in economic gains.

The Market Diversification Index captures each country's reliance on a particular market grouping with regard to the relevance of that market in world demand for manufactures. This follows the logic that heavy reliance on a large market is perhaps not ideal, but still preferable to an equally strong reliance on a much smaller market. Similar to the Product Diversification Index, it is assumed that it is optimal for countries to mirror world demand for manufactures as closely as possible (Box 8).

How has Tanzania performed in market diversification?

The results of the Market Diversification Index reveal that Tanzania ranks eighth among the fourteen countries in 2010, gaining two positions since 2000 (see Table 8). This indicates that Tanzania has made some progress by diversifying its market destinations in line with world market demand.

In the context of Tanzania's regional neighbours, Tanzania's diversification performance is generally better than that of EAC partners, mainly due to the country's more limited dependence on the EAC as a major market. Kenya, for instance – the EAC country with the most diversified manufactured exports structure – displays a very high market concentration (72 percent to sub-Saharan countries), positioning it at the end of the market diversification ranking.

As a role model, China's performance is very strong, displaying a very high alignment between Chinese production, export and world market demand (EU, East Asian & Pacific, Rest of the World and USA are the most important markets in world manufactured imports). This in conjunction with an enormous domestic market ensures that China is very well protected against declining demand in the market and financial shocks. For South Africa as a role model, the case is similar but lies closer to Tanzania's current performance. The country has managed to diversify its manufactured exports destinations over the last

Box 8: Methodology of the Market Diversification Index

The methodology of the Market Diversification Index follows the logic of the Manufactured Product Diversification Index explained above. It shows the extent to which a country depends on particular markets for its manufactured exports relative to how important those markets are in world manufactured imports.

For this exercise, we consider eight markets: the East African Community (EAC), East Asia Pacific (EAP), European Union (EU), Middle East and North Africa (MENA), United States of America (USA), sub-Saharan Africa (excluding the EAC), Latin America and the Caribbean (LAC) and the 'rest of the world'; we only take the manufactured export category in its aggregated form as if it were a single product.

The formula used is the following:

$$DM_j = 1 - \frac{\sum \left[h_{ij} - h_i \right]}{2}$$

Where DM is the Market Diversification Index value of country $_j$

Σ is the sum of all values in brackets

h_{ij} is the share of the country's exports of manufactured products to market $_i$ in the country's total manufactured exports to the world $_j$

h_i is the market's import share of all manufactured products $_i$ in total world manufactured imports

Once the Market Diversification Index values have been obtained, they are standardized following the formula for the calculation of the CIP index. Yet to obtain a ranking where 1 is best (more diversified), and 0 is worst (less diversified), we have to reverse the value order (i.e. one minus standardized Market Diversification Index value)

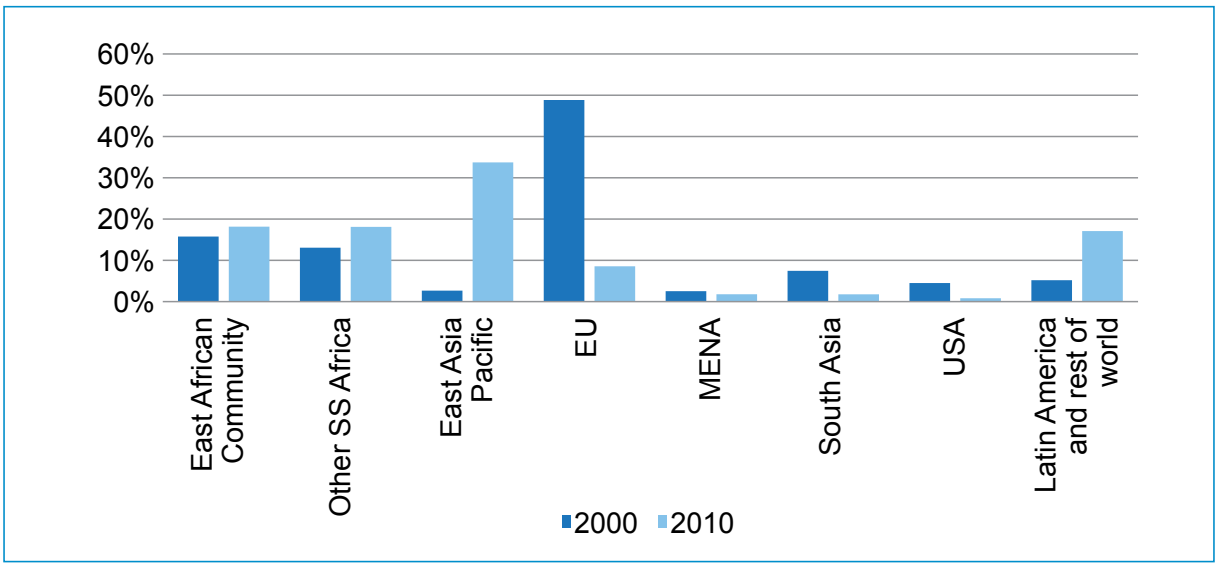
Source: UNIDO

Table 8. Market Diversification Index, 2000-2010

Ranking		Country	Index Value	
2000	2010		2000	2010
2	1	China	0.740	0.827
1	2	South Africa	0.807	0.782
3	3	Indonesia	0.729	0.729
4	4	Malaysia	0.691	0.673
11	5	Rwanda	0.559	0.587
8	6	Botswana	0.583	0.585
5	7	Mauritius	0.642	0.565
10	8	Tanzania	0.568	0.500
6	9	Ghana	0.636	0.452
9	10	Mozambique	0.569	0.442
13	11	Zambia	0.437	0.408
12	12	Malawi	0.443	0.370
14	13	Kenya	0.236	0.292
7	14	Uganda	0.592	0.260

Source: UN Comtrade (Rwanda values for 2001-2010)

Figure 13. Tanzania market concentration (destinations' share of manufactured exports), 2000-2010



Source: UN Comtrade

ten years; however, South Africa's most important markets do not coincide with the main world markets for manufactured products.

What are the key markets for Tanzanian manufactures today?

When looking at the market destination structure (Figure 13), we see that in 2000, 78 percent of Tanzania's manufactured exports used to be concentrated in two markets: the EU (49 percent) and sub-Saharan Africa (29 percent). By 2010, the concentration of manufactured exports in the EU had decreased substantially, while exports to sub-Saharan Africa (36 percent) and East Asia & Pacific gained in significance (34 percent).

The role of China and the emergence of other markets in the region have driven this change. The EU market

has continued to grow steadily in absolute terms, but growth in demand remains far behind that of Asian markets.

The demand for basic inputs for manufacturing and construction has, in particular, pushed the growth of Tanzania's resource-based sector, again with China playing the lead role in this development. The growing importance of East Asia as a consumer market in the future and the stringent standards and complex consumer demands in the European and US markets makes a strong case for Tanzania to foster strong relationships with East Asia. In addition, African markets might display less competitive pressures as well as lower demand standards, making them easier to occupy in the short run. This can help to explain why Tanzania's market concentration in East Africa and sub-Saharan Africa today continues to be 30-40 percent.

3.5.3 Vulnerability assessment

Assessing threats to industrial competitiveness with the vulnerability matrix

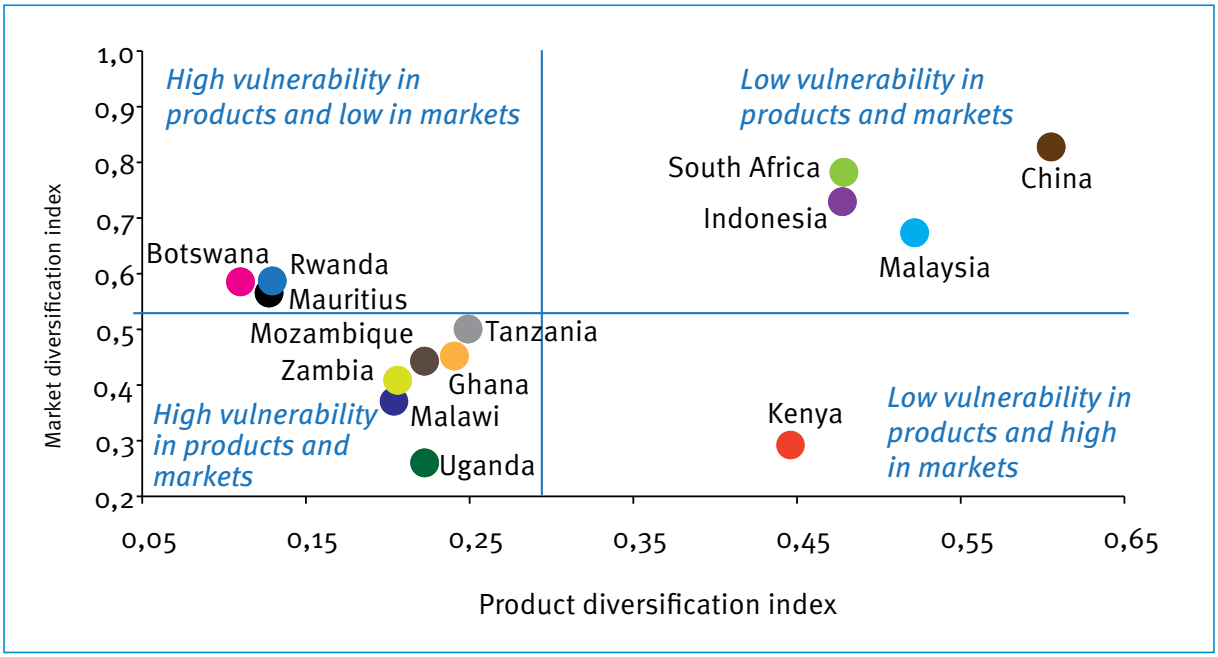
Vulnerability describes the risk a country with high concentrations or reliance on few markets and/or products faces. The vulnerability matrix combines the manufactured product and market diversification indices and positions countries relative to comparators along the market and product diversification scales. This provides a useful illustration of vulnerability in both measures. Four vulnerability quadrants are created using the index value averages. The rationale is that higher levels of diversification (in products and markets) reduce vulnerability. It is less risky to serve a large number of markets with a large number of products rather than concentrating on a very narrow product spectrum in a few selected market destinations.

Low diversification is a threat to Tanzanian industry

Tanzania displays high vulnerability in both markets and products. The lack of diversity in the product mix for export illustrated in the analysis above is slightly more worrying. It highlights Tanzania's need to reduce its dependence on a small group of products (in particular, metals) and to bolster the production and export of other manufactured products, like other resource-based and low-technology products, but with high value addition. From a political perspective, this requires active policies to promote new manufacturing activities and attract investment and expertise for these sectors. The lack of a more diversified market coverage suggests that Tanzanian manufacturers are not actively participating in several important world markets while they put a strong emphasis on China's huge demand only.

The performance of Kenya is particularly interesting: as a direct neighbour of Tanzania, its product diversity

Figure 14. Vulnerability matrix, 2010



Source: UN Comtrade

is quite high, suggesting that it has a much more varied base of manufacturing. Tanzania could certainly learn from that experience and should explore the policies implemented by the Kenyan government to achieve this mix.

As may have been expected, the more mature economies in our selection – China, South Africa, Malaysia and Indonesia – are characterized by high diversification, both in terms of products and markets, and by low vulnerability to changing demand, price fluctuations and third-country competition. In the long run, Tanzanian industry should aim at a similarly balanced structure which considerably reduces vulnerability.

3.6 The world's most dynamic manufactured exports

Dynamic products and industrial competitiveness

Structural change is not just about technological transformation, it is also important to analyse the ability of countries to shift their production and exports structure fast enough to respond to changes in global demand. Countries that are able to satisfy the new market demands demonstrate readiness to compete. However, it is important to mention that creating the national capabilities to produce and export new goods is a difficult task, as industrialization is a slow-gestating and path-dependant process. In fact, it is a process that might take decades for the country to build competitive muscle in sectors where the necessary technology and human skills are not yet available.

The world's most dynamic products are the 20 product groups that have witnessed the highest growth in demand over the given period (2000-2010 in our analysis), and are important in terms of export value. Obviously, as demand for these products grows, there is potential for countries to step in to meet this demand.

Over the last decade, the products that have gained the largest shares in world markets have largely been resource-based (in general, processed metal products and oils) – mainly driven by China and India's increasing demand for such products. Resource-based exports and industry therefore offer countries with the right endowments to take advantage of this opportunity. Countries such as Oman, Kuwait, Norway and the Southern USA have long been examples of how resource-based industry can promote an industrious and prosperous society – we will deal with this in more depth in Section C.

What are the 20 most dynamic products, and how has Tanzania performed?

Tanzania has performed quite well in capitalizing on the growth of the world's most dynamic products in the last decade. In fact, out of Tanzania's top five exports, three products appear in the top 20 list (table 9). A high growth rate has been recorded for copper ores, plastic scrap and fertilizers – these products also have a significant export value in Tanzania. Although relatively smaller, sugar, molasses and vegetable oils also display encouraging growth and a reasonable export base level. That is, there appears to be a very strong possibility for Tanzania to capitalize on this trend.

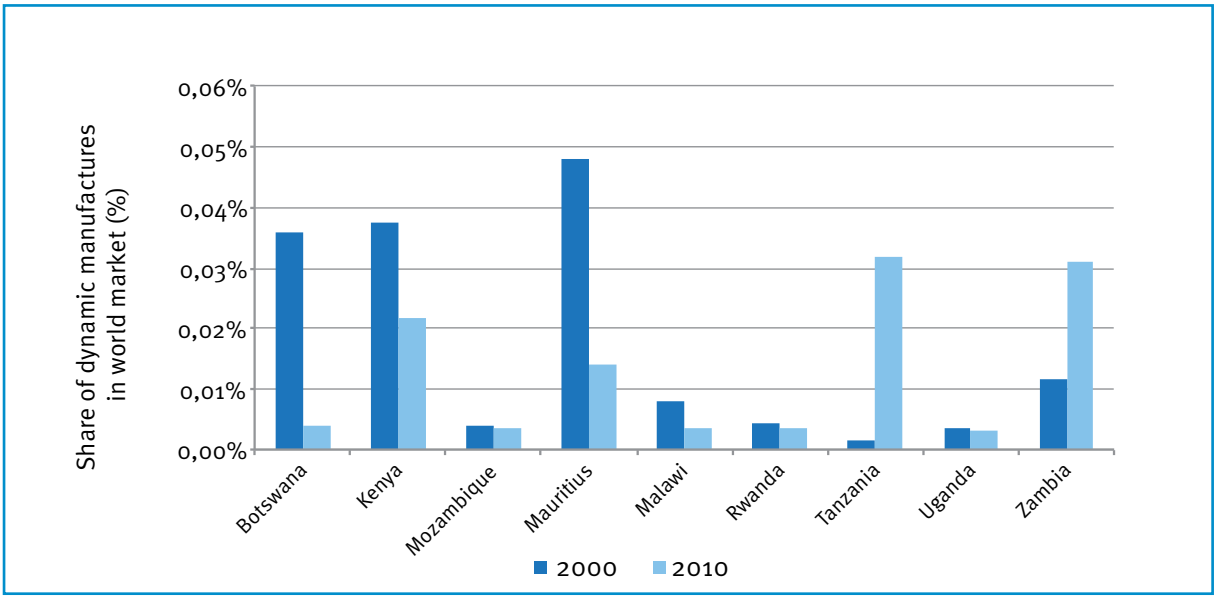
By expanding within these products (and at phenomenal annual growth rates), Tanzania was able to establish a robust and low competition export structure and earn significant export income. While this structure warrants some caution, it certainly offers a potential to use these financial inflows as a starting point to support the emergence of other industries in the future. Thus, resource-based industrial expansion constitutes an important strategy towards industrialization for Tanzania in the short run. This may be even more relevant with the discovery of substantial natural gas reserves off the southern coast near Mtwara. The challenge of how to best use the funds generated by natural endowments to invest in the future will have to be met by several countries in the region. Mozambique also has sizable gas reserves on its side of the border, while there is heavy demand for Zambia's copper resources. This issue will be analysed in detail in Section C of this report.

Table 9, Tanzanian and world growth in the 20 most dynamic exports

Tech-nology classifi-cation	Code	Product	World exports		Tanzania exports	
			2010 value (US$ thousands)	Annual Growth rate 2000-2010 (%)	2010 value (US$ thousands)	Annual growth rate 2000-2010 (%)
RB	281	Iron ore/concentrates	102,782,970.3	27%	0	
HT	871	Optical instruments nes	75,839,286.5	21%	20	45%
RB	283	Copper ores/concentrates	41,905,141.3	21%	1,315	
RB	282	Ferrous waste/scrap	43,382,940.8	19%	1,043	67%
RB	422	Fixed veg oils not soft	35,963,684.6	19%	12,305	40%
RB	287	Base metal ore/conc nes	25,682,449.0	18%	361,115	476%
RB	288	Nf base metal waste nes	36,352,774.5	16%	146,150	90%
RB	335	Residual petrol, prods	36,046,826.7	16%	13,800	57%
MT	793	Ships/boats/etc	167,424,661.6	16%	678	74%
HT	541	Pharmaceut exc medicamnt	132,462,621.3	16%	348	-4%
HT	542	Medicaments include vet	315,037,218.1	15%	2,726	40%
MT	562	Manufactured fertilizers	50,373,763.7	15%	59,910	814%
RB	334	Heavy petrol/bitum oils	631,580,235.6	15%	2,151	15%
MT	671	Pig iron etc ferro alloy	34,359,797.7	15%	0	
HT	751	Office machines	46,019,119.9	14%	157	
RB	61	Sugar/mollasses/honey	34,884,006.6	14%	12,885	10%
MT	761	Television receivers	94,703,295,5	14%	203	
RB	421	Fixed veg oil/fat, soft	28,239,627.9	13%	26,349	63%
LT	679	Iron/steel pipe/tube/etc	72,742,899.7	13%	17,815	57%
LT	899	Misc manuf articles nes	68,388,677.1	13%	1,434	32%

Source: UN Comtrade

Figure 15. Share of dynamic products in world markets, 2000-2010



Source: UN Comtrade

Table 10. Dynamic exports for Tanzania and comparators. 2000-2010

Dynamic exports per capita					Dynamic products in total manufactured exports				
Ranking		Country	Value (US$ per capita)		Ranking		Country	Shares	
2000	2010		2000	2010	2000	2010		2000	2010
1	1	Malaysia	326.08	1,099.72	1	1	Rwanda	93%	80%
3	2	South Africa	99.77	364.20	8	2	Zambia	18%	46%
2	3	Mauritius	194.88	229.05	4	3	Mozambique	31%	42%
5	4	Indonesia	28.79	137.93	6	4	South Africa	24%	37%
6	5	China	12.78	129.15	10	5	Indonesia	14%	35%
8	6	Zambia	5.47	49.98	14	6	Tanzania	6%	35%
4	7	Botswana	98.99	42.45	3	7	Malawi	57%	25%
14	8	Tanzania	0.23	14.73	7	8	Ghana	20%	21%
7	9	Kenya	5.80	11.14	9	9	Mauritius	16%	20%
11	10	Rwanda	2.48	6.99	11	10	Malaysia	9%	19%
9	11	Ghana	4.95	5.74	5	11	Kenya	30%	18%
10	12	Malawi	3.48	4.87	2	12	Uganda	58%	17%
12	13	Mozambique	1.04	3.06	12	13	China	7%	11%
13	14	Uganda	0.72	2.01	13	14	Botswana	7%	2%

Source: UN Comtrade

Benchmarking against comparators

To analyse the following indicators and benchmark Tanzania and its comparators, a category called "20 most dynamic manufactured products in the world" was created as a unique product group. Of all comparator countries, Tanzania has the highest reliance on dynamic products. In fact, the dynamic product group accounts for half of all Tanzanian manufactured exports during 2010.

This group of 20 products played a minor role in Tanzania's export mix in 2000. This suggests that Tanzania was very successful in exploiting the growth in demand for this group of products between 2000 and 2010. It also indicates some success in responding to global market demand, with 61 percent of all manufactured export growth coming from this product group.

Botswana, Kenya and Mauritius had a much higher reliance on these products in 2000, but despite booming demand failed to capitalize through increased exports of the most dynamic products. In that sense, the data shows that Tanzania is currently riding the waves of high demand growth for resource-based manufactures which it is exporting more successfully than other African countries. Figure 15 shows that Tanzania's world market share in these products is substantially higher than that of other African countries.

What does this performance mean?

Despite the importance of the most dynamic manufactured products in the export structure of Tanzania, its absolute export capacity – measured as exports per capita – is still fairly limited (US$ 15 per capita in 2010) compared to other competitors. Botswana achieves a higher value per capita from dynamic exports, with a mere 2 percent of all exports coming from this sector. In Malaysia, 19 percent of exports come from the dynamic product group and the country achieves an export per capita value of more than US$ 1,000.

While these product categories accounted for only a very small portion of Tanzania's exports in 2000 (with the lowest earnings of all comparator countries), the last year was heavily influenced by the three key metal resources positioning Tanzania sixth in the ranking with 35 percent of its manufactures coming from these dynamic products. Considering the exhaustible nature of these resources, the time has come to increase the value addition significantly instead of exporting the remaining resources with equally limited domestic linkage effects.

SECTION C: KEY CHALLENGES AND OPPORTUNITIES FOR INDUSTRIALIZATION IN URT

4. Regional Integration and Industrial Development

4.1 Background on regional integration

Why does regional integration matter for industrial development?

Regional integration is usually part of the policy agenda in most developing countries as an important trigger for economic growth through enhanced openness and trade competitiveness. In sub-Saharan Africa, the pursuit of regional integration corresponds to the need to harmonize economic policies, enlarge market opportunities (given the small size of a fairly high number of countries) and to have a stronger bargaining position vis-à-vis other trading blocks.

The advocates of regional integration argue that regional integration can foster competition, provide acces to wider markets, help diversify investment and production, and facilitate the common solutions that affect governance, peace, defence and security throughout the region. On the other hand, integration may lead to a sense of 'loss' of national sovereignty as national affairs are viewed as being one block. Opponents of regional integration assert that the conditions in many developing countries are not conducive to success and therefore fail to take advantage of these 'supposed' benefits. For instance, integration requires strong commitment by all parties to implement the agreements, fair mechanisms to arbitrate disputes and most importantly, an equitable distribution system that allows all countries, both strong and weak, to benefit from it (Walkenhorst 2005, Mothae 2005).

There are very few references in the literature about the impact of regional integration on industrial development. However, as trade liberalization is the primary goal of regional integration, statements can be made about the impact of trade liberalization on industrialization and structural change, which has been widely documented in the literature. According to an UNCTAD report, 40 percent of the 46 sampled developed countries experienced fast growth in manufactures, but only in a minority of these, mostly in East Asia, did this trade growth go hand in hand with enhanced industrial supply capacity and upgrading. More worryingly, the report states that in half of the sampled countries, mostly in Africa and Latin America, openness led to de-industrialization. Even in those cases in which manufactured exports grew extremely fast, MVA did not accelerate and upgrading of the industrial base did not take place. Slow growth of exports and de-industrialization have also been accompanied by increased vulnerability of the economy – particularly the manufacturing sector

– to external factors, particularly as far as reliance on imports is concerned (Shafaeddin, 2005).

Another study conducted in Latin America concludes that trade liberalization has short- and long-term effects, and that countries which do not have a strong industrial base are expected to miss out on long-term effects (Dijkstra, 1997). The author of the study argues that it is therefore important for countries to establish an industrial base which supplies internal and external economies and in which learning effects play a role. This calls for industrial policies that complement trade liberalization policies.

The evidence above has important implications for URT. While regional integration is normally conceived as a trigger for economic growth and competitiveness, it now seems that the benefits of integration vary depending on the country's level of development and maturity. For instance, the success of East Asian trade integration is attributable to the fact that liberalization not only evolved gradually as part of a long-term industrial policy, but also that the majority of countries have reached a certain level of industrial maturity. With most of SSA being marginalized in the international industrial scene, it is difficult to see how regional integration can be a catalyst for industrial growth in the region. Or is it that across-the-board liberalization in SSA has in fact contributed to the destruction of industry, particularly of those industries that are uncompetitive or at the infancy stage? Some authors like Sanjaya Lall (2001) seem to support this view.

East African Community (EAC): A brief history and goals

Although Tanzania is part of several regional blocks, this report focuses on the East African Community (EAC), which plays a more significant role for Tanzania and its neighbouring countries. EAC is the intergovernmental organization comprising Kenya, Uganda, the United Republic of Tanzania, Rwanda and Burundi, whose mission is "*to widen and deepen Economic, Political, Social and Culture integration in order to improve the quality of life of the people of East Africa through increased competitiveness, value added production, trade and investments*" (EAC website).

It was first established in 1967 with the cooperation of Kenya, Tanzania and Uganda. Following its dissolution in 1977, it took around 20 years to establish the Permanent Tripartite Commission for East African Co-operation and for the new treaty to enter into force. Between 2005 and 2010, the EAC implemented a customs union and a Common External Tariff on imports from third countries, duty-free trade between the Partner States and common customs procedures. In 2007, Rwanda and Burundi became full members of the EAC and joined the EAC Customs Union in 2009.

In 2010, the EAC Partner States signed a Common Market Protocol that seeks to "*accelerate regional economic growth and development by introducing the free movement of goods, persons and labor, the right of establishment and residence, and the free movement of services and capital*". It is also expected that the Protocol will strengthen, coordinate and regulate the economic and trade relations among the Partner States.

The overall objective with regard to industry, according to the East African Community Industrialization Policy 2012-2032, is to create a market-driven competitive industrial sector based on the comparative and competitive advantages of the EAC region, and to accelerate the structural transformation of the Partner States' economies.

The specific policy targets are diversifying the manufacturing base and raising the valued added content of resource-based exports from 8.62 percent to 40 percent by 2032; strengthening national and regional institutional frameworks and capabilities for industrial policy design and implementation; strengthening R&D technology and innovation capabilities; increasing the contribution of intra-regional manufacturing exports relative to total manufactured imports; and transforming MSMEs so they can increase contributions in manufacturing GDP from currently 20 percent to 50 percent by 2032.

EAC intra-regional manufactured trade rose from US$ 373 million in 2000 to US$ 1.7 billion in 2010, an average annual growth rate of more than 16 percent for the decade. Yet this only accounts for 35 percent of the EAC's total manufactured trade in 2010, down from 50 percent in 2000 (Table 11). A similar trend is observed in sophisticated industries (medium- and high-tech exports) and less complex manufactures (resource-based and low-tech exports).

As Table 11 shows, intra-regional trade shares in SADC stagnated from 2000 to 2010, indicating that SADC members are seeking markets outside the community and even outside the region. On the whole, the regional integration agreements in sub-Saharan Africa have not led to the desired trade results, with less than 30 percent of the region's manufactured trade taking place within SSA.

Table 11: Intra-regional trade share in EAC, SADC and SSA by trade category, 2000-2010

Product	EAC-EAC		SADC-SADC		SSA-SSA	
	2000	2010	2000	2010	2000	2010
Total	19%	21%	15%	15%	14%	19%
MNF	50%	35%	18%	18%	24%	28%
MHT	61%	54%	21%	19%	28%	33%
RB/LT	48%	30%	17%	18%	22%	25%

Source: UN COMTRADE

Box 9: Ongoing integration negotiations

Tanzania's trade policy has not been modified since 2003, despite the huge amount of discourse and work in the forums of regional groups, new common policies under the EAC are still under review, as are policy agreements under the WTO. It appears that the process of defining a new trade policy may be an extended process as the EAC gears up to engage in concrete discussions on a new tripartite system.

Membership multiplicity has been a factor of concern for EAC governments, with multiple memberships across the EAC, SADC, IOR, COMESA and the AU. In 2008, the Secretariats of the EAC, SADC and COMESA met in Kampala to discuss the possibility of a unified FTA for the 26 countries under the three regional economic communities. A Tripartite Trade Negotiation Forum was established to continue the negotiations at a more technical level. The aim of the negotiations was to "harmonize all market issues".

In 2011, a summit was held in Johannesburg to review the developments of the forums and the mandate was given to continue with the process. Following the conference, the EAC met in August 2011 to discuss a block position on matters relating to budgeting, rules and regulations of the tripartite system.

The process has continued to gather steam in the interim period. In 2012, three major forums were arranged in Lusaka in March, Mauritius in May/June and in Arusha in September to review the findings of the technical working groups.

Source: Ministry of Industry and Trade, Tanzania

4.2 Regional integration and Tanzanian industry

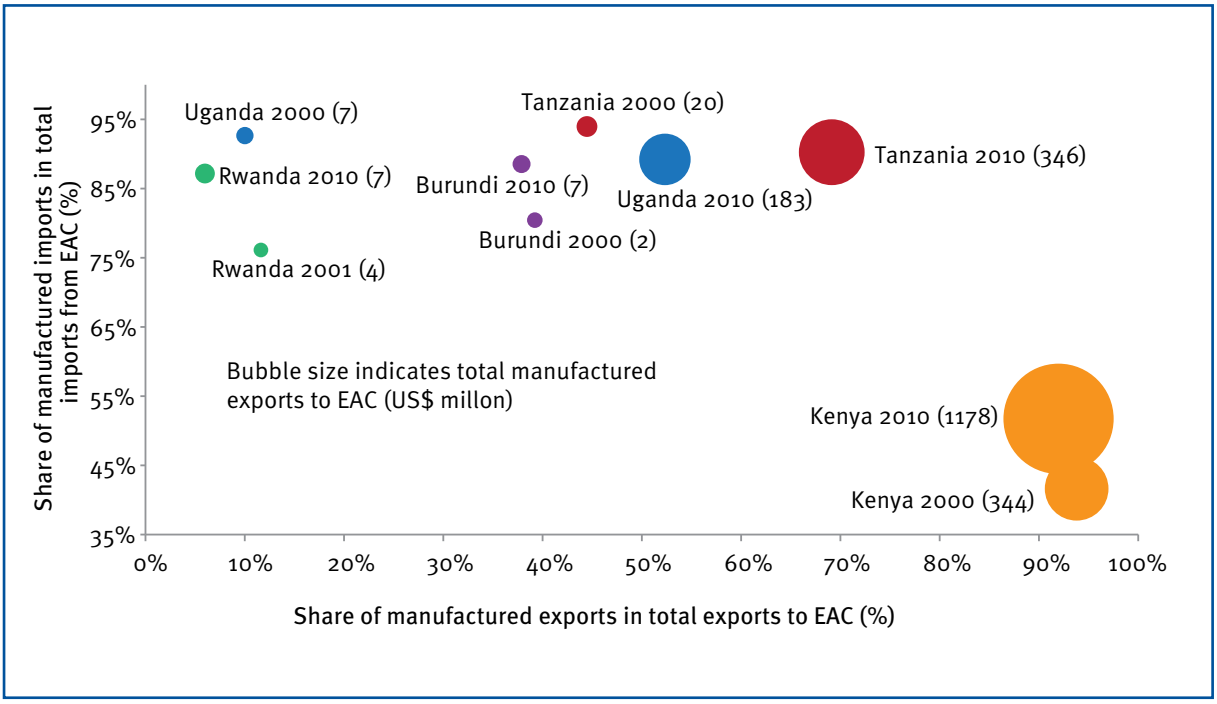
The effects of regional integration on Tanzania's industrial exports

Tanzania has staged an impressive performance in the EAC – manufactured exports skyrocketed from US$ 20 million in 2000 to US$ 183 million in 2010. Tanzania now accounts for around 20 percent of all EAC intra-regional manufactured exports, up from only 5 percent in 2000. Interestingly, Tanzania's manufactured exports to the EAC in 2010 are similar to those of Kenya ten years earlier, suggesting that as far as their role in East Africa is concerned, there might be a 10-year trade gap between the two countries.

Does this mean that Tanzania may have benefited from intra-regional trade? Figure 16 provides interesting insights on this question.

Kenya is clearly the major beneficiary of the agreement, which again confirms that countries with stronger industrial structures tend to maximize the gains from integration. Kenyan manufactured exports to the EAC grew from US$ 344 million to more than US$ 1 billion within ten years only. While manufactures account for more than 90 percent of Kenyan exports to the EAC, manufactured imports only account for 55 percent. As we shall see later, this has led to an impressive positive trade balance. By contrast, Tanzania is a net importer of most industrial goods in the EAC, mostly from Kenya.

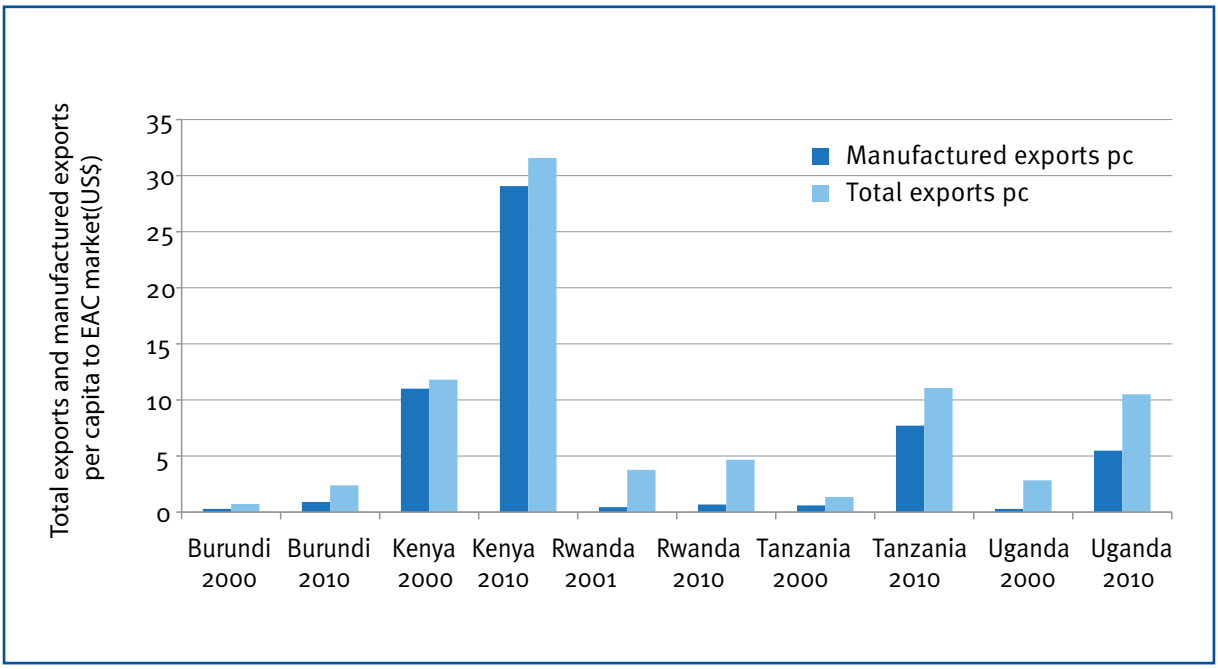
Figure 16: Share of manufactured exports/imports in total exports/imports in EAC, 2000-2010



Source: UN COMTRADE

Note: For Rwanda exports 2001-2009 and imports 2001-2009

Figure 17: Total exports and manufactured exports per capita to EAC markets, 2000-2010



Source: UN COMTRADE

Taking market size into account, proxied by per capita trade, it is clear that although Tanzania has made significant progress within the EAC, it still trails far behind Kenya (see Figure 17).

One way to assess whether regional integration has led to convergence or to further economic disparities is to look at structural change. Table 12 provides some insights into this aspect.

Table 12: Manufactured exports and imports of EAC members from and to EAC by category, 2000-2010

Country	Product category	Exports (in US$ thousands)		Annual growth rate (CAGR)	Imports (in US$ thousands)		Annual growth rate (CAGR)	Net trade (in US$ thousands)	
		2000	2010	2000-2010	2000	2010	2000-2010	2000	2010
Burundi	HighTech	2	265	68%	598	3,945	21%	-596	-3,680
	LowTech	29	423	31%	4,626	28,521	20%	-4,597	-28,098
	Manufactures	2,343	6,836	11%	25,925	74,048	11%	-23,582	-67,211
	MediumTech	113	1,386	28%	1,801	12,789	22%	-1,688	-11,403
	Resource Based	2,199	4,762	8%	18,901	28,792	4%	-16,701	-24,030
Kenya	HighTech	14,205	86,696	20%	929	7,583	23%	13,276	79,114
	LowTech	110,326	344,634	12%	4,123	39,573	25%	106,202	305,061
	Manufactures	343,984	1,177,578	13%	8,013	131,871	32%	335,970	1,045,707
	MediumTech	40,940	279,724	21%	1,693	21,030	29%	39,247	258,695
	Resource Based	178,513	466,524	10%	1,268	63,686	48%	177,245	402,838
Rwanda	HighTech	-	333		1,214	13,047	35%	-1,214	-12,714
	LowTech	149	1,643	35%	9,091	67,914	29%	-8,943	-66,270
	Manufactures	3,718	5,864	6%	26,883	283,547	34%	-23,165	-277,683
	MediumTech	850	1,192	4%	4,439	70,873	41%	-3,589	-69,681
	Resource Based	2,720	2,701	0%	12,139	131,713	35%	-9,419	-129,012
Tanzania	HighTech	2,758	25,744	25%	6,949	34,213	17%	-4,191	-8,470
	LowTech	6,505	141,223	36%	19,576	59,631	12%	-13,071	81,592
	Manufactures	20,370	345,658	33%	88,366	265,942	12%	-67,996	79,715
	MediumTech	3,181	85,781	39%	18,070	81,894	16%	-14,889	3,887
	Resource Based	7,927	92,910	28%	43,771	90,204	7%	-35,844	2,707
Uganda	HighTech	57	4,002	53%	10,315	45,240	16%	-10,258	-41,239
	LowTech	4,409	39,971	25%	36,719	123,716	13%	-32,310	-83,744
	Manufactures	6,870	183,153	39%	282,944	513,619	6%	-276,074	-330,465
	MediumTech	1,306	29,860	37%	29,144	100,525	13%	-27,838	-70,665
	Resource Based	1,098	109,568	58%	206,766	244,138	2%	-205,668	-134,570

Source: UN COMTRADE

The clearest picture emerges for Kenya, which has a positive trade balance in all categories. Interestingly, Tanzania has an overall positive trade balance in manufactured trade today with other EAC members, reversing the trend of 2000 when the country faced a deficit in all technological categories. Low-tech exports to the EAC deserve special attention, with exports growing at 36 percent between 2000 and 2010. This confirms that Tanzania is clearly becoming a stronger player in the industrial markets of the EAC, not only in resource-based manufactures but also in labour-intensive sectors.

Despite the trade hype, the EAC Development Strategy states that the potential to produce diversified and value added manufactures continues to remain

untapped. The industrial share of GDP declined for the region, indicating that trade growth has not gone hand in hand with industrialization (EAC 2011).

The impact of regional integration on Tanzania's investment and poverty reduction

A study by the African Development Bank finds that increased intra-regional trade has not led to more FDI in Tanzania, hence limiting the impact of investment as a source to generate more jobs and reduce poverty (AfDB 2010). FDI inflows in Tanzania have concentrated on sectors with few linkages with the rest of the economy, like the mining sector. The AfDB also claims that regional integration, which is a platform for cooperation on development projects, has had very limited success in addressing poverty issues.

In countries that have a primarily rural economy, the unfavorable economic conditions limit the benefits of regional integration, in particular for the poor. In Tanzania, as well as in many other SSA countries, the lack of functioning markets, the low skill levels, poor infrastructure and reliance on subsistence agriculture limit the country's ability to benefit from a process that addresses country-wide macro competitiveness. Further research throws light on the relationship between regional integration and poverty reduction in Tanzania, and determines whether poverty alleviation can be addressed through development cooperation or simply through traditional means like exports and investment.

4.3 Future opportunities and challenges

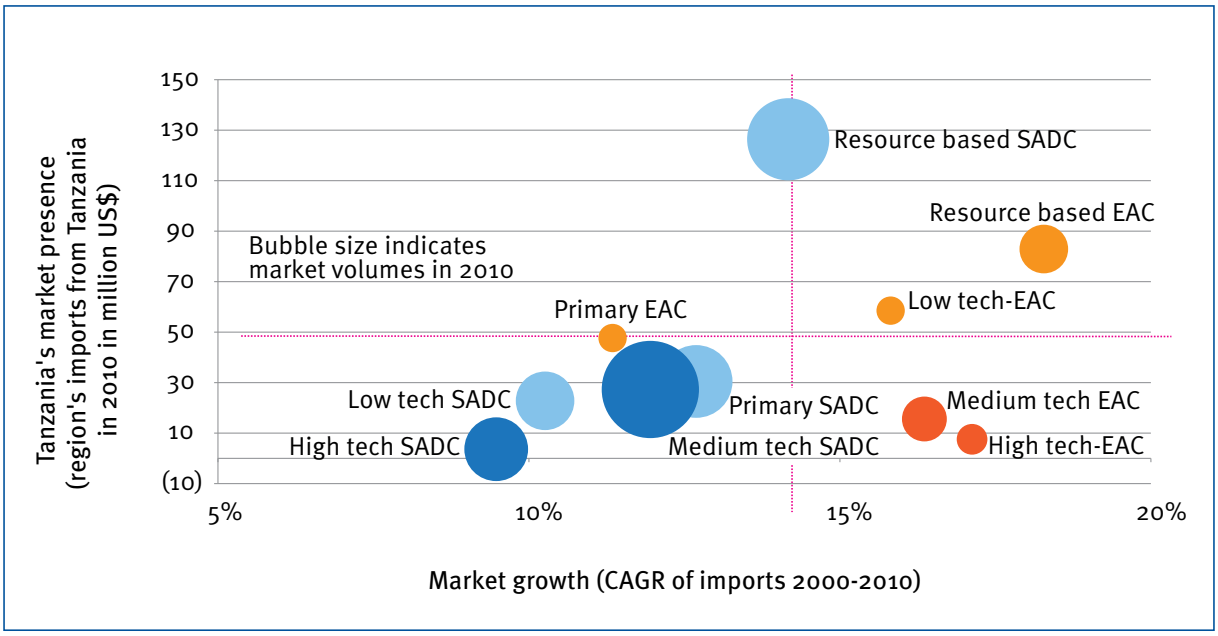
Future opportunities for Tanzanian manufacturing in EAC and SADC

Lower standards in SADC and EAC markets make them more attractive to countries with infant industry in more technologically sophisticated products.

Thus, although market opportunities are the focus of the next chapter, in the following we begin to take a more in-depth look at available market opportunities in the two regions based on demand for the different product categories. The following findings emerge from the analysis:

- Both markets have a very high growth rate in general – even the slowest growing product groups have growth rates above 9 percent annually;
- The existing market for resource-based manufactures remains the largest in both regions;
- The EAC market is growing faster for low-, medium- and high-tech goods. This market, albeit being a smaller one, offers an easier route for deepening sophistication;
- Primary and resource-based goods are the fastest growing groups in SADC, which reflects a de-sophistication of the demand structure of SADC.

Figure 18: Market growth and Tanzania's presence in EAC & SADC markets for manufactured products 2000-2010



Source: UN COMTRADE

In a nutshell, the analysis suggests that focusing on the EAC market seems to be more relevant for Tanzania to tap into faster and more sophisticated demands (Figure 18).

On the whole, SADC markets are bigger than EAC markets for manufacturing products. However, EAC markets for most technology levels are more dynamic than the respective SADC markets. Since it is easier to access markets that are growing faster, the EAC seems to offer more opportunities for Tanzanian manufactures.

Currently, Tanzania is mostly involved in the markets for resource-based manufactures in SADC and EAC, which are both growing very fast and thus offer opportunities for expansion of current export volumes. However, since Tanzania already captures a relatively high share of these RB markets, there is also the risk that Tanzanian products could be replaced by those of other competitors in the future.

New opportunities also exist in medium- and high-technology manufacturing in the EAC, because these product groups are growing well above average and Tanzania is currently not yet extensively involved in these categories.

In terms of size, the market for medium-technology products in SADC is the largest, but it is growing just below average of all regional markets. Still, given the high demand, Tanzania could also aim at serving existing market demand. This would, however, require a replacement of deliveries from other competing countries.

Challenges to benefitting from regional integration

Tanzania will have to address certain challenges, if it is to benefit from regional integration. Some of these challenges are linked to the fact that Tanzania's low competitive performance in manufacturing is not an exclusively demand-driven problem, and that increased access to markets may therefore be insufficient to resolve it:

- Low industrial capabilities. Skills, technology and infrastructure shortages limit Tanzania's capacity to benefit from the enhanced trade prospects of regional integration. Over the last ten years, Tanzania has made some progress, but it trails far behind Kenya. The problem of industrial skills will be analysed in more detail in a subsequent chapter;

- Low purchasing power within EAC. Structural change towards high value added sophisticated manufactures can be hampered by the limited purchasing power within the region. Although technology exports have increased within the EAC, it is clear that the region does not offer stimulus for the development of a world-class industrial sector;

- Different levels of development, and particularly in the sophistication and maturity of the manufacturing sector, seem likely to continue inhibiting equitable growth. Such imbalances are reflected in countries' export structures to the EAC, with poorer countries (Uganda, Rwanda, Burundi and Tanzania) specializing in primary commodities and unsophisticated manufactures, and the wealthier country (Kenya) specializing in manufactured goods;

- The EAC still lacks an overarching institutional framework and an effective regional infrastructure regime that can level the playing field and benefit its weaker players. The absence of such mechanisms is felt by those countries with a deficient regulatory

Box 10: Non-tariff barrier removal mechanisms

The elimination of non-tariff barriers was officially initiated in 2007, with effective implementation starting during 2010. Due to the overlap of membership across regional economic communities, all NTB eliminations are effective for all members of COMESA, SADC and EAC.

A national monitoring committee has been established in each country with three main focal points from each government overseeing the complaints mechanism and effective implementation of barrier removal. The EAC maintains an independent time-matrix on all new complaints, current open complaints and resolved disputes. The primary tool for NTBs, however, is the SADC website, which now hosts all RECs (http//tradebarriers.org/).

Source: Ministry of Industry and Trade, Tanzania

framework and poor infrastructure for trading. For instance, most EAC countries face cumbersome trade logistics due to multiple roadblocks along transport corridors. This results in excessive delays and high transport costs. The AfDB study finds that efficient customs operations are obstructed by excessive documentary requirements, insufficient use of automated systems and lack of cooperation among customs and other governmental bodies.

5. Opportunities and competitive challenges in the domestic and international market

5.1 How markets matter for industrial competitiveness

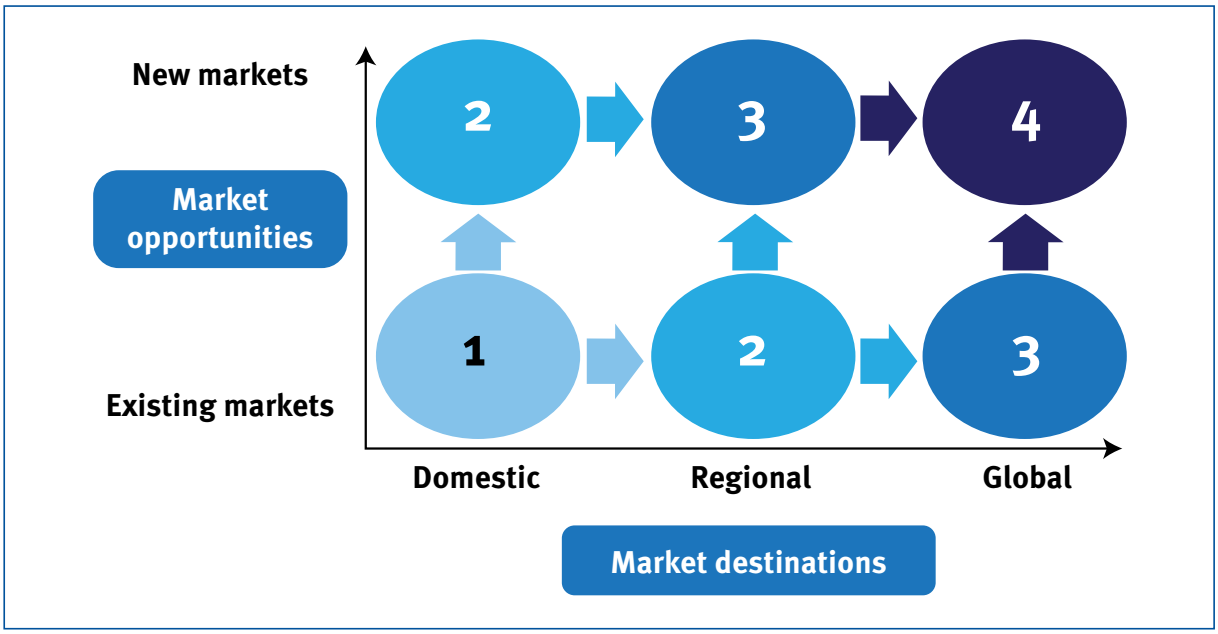
Section B of this report showed that despite its recent growth, industrial production is still relatively low in Tanzania. There are a number of reasons for this lack of manufacturing activities both on the supply as well as on the demand side. This chapter will explore the demand side factors, namely the market potentials for Tanzanian firms as well as existing threats by foreign competition.

The exploitation of market potentials is the key to success for any manufacturing enterprise that aims to increase its sales and achieve a sustainable competitive advantage. Even more so, profit seeking entrepreneurs who consider investing in industry will only do so if an attractive market attracts their attention. Accordingly, market demand can be considered a key driving force for the emergence of a competitive manufacturing sector in Tanzania. In this regard, market transparency is of high value, as a sustainable industrial growth path can only be initiated if the produced goods are in line with customers' interests and requirements. This chapter is a first step towards a more evidence-based evaluation of market opportunities for Tanzanian industry, which more detailed sub-sectoral studies can build upon in the future.

From local heroes to global champions

Naturally, most Tanzanian producers would first look at the existing demand in their domestic market before considering international opportunities. As the market's characteristics, including customer needs, tastes, geography, demographics and distribution methods are more familiar, it is likely to be the easier place for companies to launch a product. With one of the largest and fastest growing populations in Africa, Tanzanian manufacturers are fortunate to have a sizeable home market at their disposal, which is likely to expand substantially in the near future.

Figure 19: Illustration of step-wise market exploitation opportunities for Tanzanian industry



Source: Created by authors

Note: 'existing markets' refers to product categories for which there already is a large demand while 'new markets' refers to emerging demand in other product categories.

Table 13: Tanzania's global trade balance in selected product categories. 2000-2010

Product category	Trade balance in 2000 in US$ thousands	Trade balance in 2010 in US$ thousands	Average annual increase of trade deficit (CAGR 2000-2010)
All products	**-930,638**	**-4,091,240**	**16%**
Primary products and other transactions	**359,084**	**1,480,729**	**15%**
Manufactured products	**-1,289,722**	**-5,577,752**	**16%**
Medium-tech manufactures	-519,314	-2,500,055	17%
Petrol/bitum oils	-286,842	-2,150,798	22%
High-tech manufactures	-151,258	-626,846	15%
Low-tech manufactures	-187,851	-551,636	11%
Resource-based manufactures (excl. petrol/oils)	-144,457	251,584	-

Source: UN COMTRADE

A market exploitation strategy for Tanzanian industry is thus most likely to start in the existing domestic market, as illustrated in Figure 19. Provided that these opportunities are adequately exploited, the second step could take two directions: on the one hand, firms could aim at exploiting new domestic growth markets that are currently emerging. On the other hand, firms could also consider cross-border expansion, targeting attractive existing markets in neighbouring and regional countries. In a third step, given that regional markets are sufficiently attractive, some firms might decide to further benefit from the new demand that is emerging there with the aim of becoming regional powerhouses for the supply of manufactured products. Some firms might also consider to "go global" to benefit from sizeable markets in high income countries and/or rapidly growing new markets in emerging economies. This chapter presents a number of opportunities that exist in each of these markets, and sheds some light on competitive pressures that will have to be withstood in order to succeed.

5.2 Opportunities and threats in the domestic market

A sizeable and rapidly expanding national market

With a population that is expected to soon surpass the 50 million mark, accompanied by a continuous increase in purchasing power, the Tanzanian market for manufactures offers plenty of opportunities. While data on domestic demand for industrial goods is not readily available, an analysis of trade patterns can provide some instructive insights. In fact, imports of manufactured products increased by an average of 18 percent annually over the last decade, reaching nearly US$ 7.5 billion in 2010. This means that more than 93 percent of the goods that Tanzania is currently importing are manufactures, suggesting a lack of a vivid presence of domestically manufactured products.

Does import dependency pose a threat to domestic manufacturers today?

In many cases, developing countries do not possess the required capacities in the industrial sector to satisfy the increasing demand for manufactures resulting from their economic and social progress and the emergence of a middle class. Accordingly, consumers as well as businesses will look abroad to purchase the required goods from other countries. Table 13 highlights the special role manufactured products play in the currently widening trade deficit of the Tanzanian economy. Following a rapid increase in the last decade, the sectoral trade balance for manufactures accumulated to roughly US$ -5.6 billion in 2010. Although the widely discussed effect of the rapidly growing demand for oil is indeed substantial, it is rather surprising to see that this only accounts for less than 40 percent of the current trade deficit in manufactured products. In fact, today as well as a decade ago, medium-technology manufactures[7] accounted for a higher share of imports and contributed more to the Tanzanian trade deficit than oil. Moreover, high-technology as well as low-technology manufactures also show a considerable trade deficit, while resource-based manufacturing is the only sub-category that managed to change course and generate a trade surplus along with the primary commodity sector.

7 Medium-technology products include automotive-, process- and engineering-industry goods, with automotive accounting for the largest share in the Tanzanian case.

Box 11: The dangers of liberalization – A case study of the tyre industry

The economic argument for investment in the tyre industry appears strong, but the industry faces difficult challenges. Tyres are among the high demand products on the East African market as result of the high demand for motor vehicles in general. The import market is worth approximately US$ 300 million in East Africa and US$ 150 million in Tanzania.

From the 1970s to 1990s, Arusha-based General Tyre East Africa was one of the largest companies and employers in Tanzania. The tyre manufacturing company had export markets in Eastern and Central Africa before closing down in 2009. The success of the General Tyre East Africa company during the 1990s suggests that Tanzania had a comparative advantage in the production and export of rubber tyres and treads to meet East and Central African demand. Today, there is increasing demand for rubber tyres worldwide.

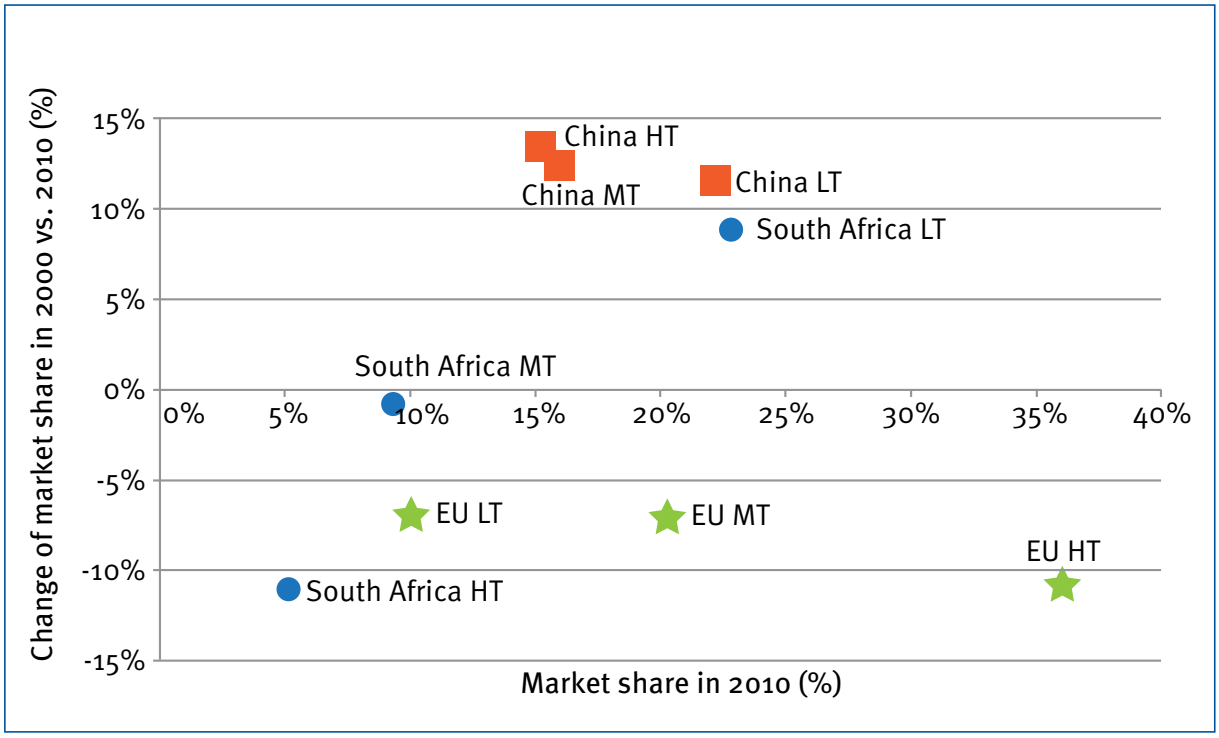
In 2009, General Tyre East Africa closed its operations amid an influx of cheap imported tyres, mainly from China. The Ministry of Industry and Trade held talks with Continental AG of Germany to terminate the existing contract due to the lack of reinvestment in the company. Productivity at the factory had begun to deteriorate at the end of the 1990s due to imports of second-hand tyres and an increase in tyre vendors providing cheaper options to customers.

Despite the government's decision to ban the import of second-hand tyres, General Tyre East Africa failed to recover and was forced to borrow money from various foreign banks to fund its operation. Failure to repay the loans, in turn, forced the government to provide a US$ 10 million bond for the factory in 2005. The factory failed to secure further funding thereafter, and was unable to purchase the necessary materials for production, eventually having to close down.

The experience of General Tyres East Africa and the loss of public money incurred make a new investment in the industry unattractive. Rubber is still being produced in the Northern regions, and a multi-million dollar market exists in East Africa. A feasibility study would need to address whether a new investment could become competitive based on current import figures. The loss of this industry, however, clearly highlights the perils of trade liberalization.

Source: Ministry of Industry and Trade, Tanzania

Figure 20: Tanzania's manufactured imports from the EU, China and South Africa, 2000-2010



Source: UN COMTRADE

The surge of Chinese manufactured imports

In the past, Tanzania's relatively small domestic demand for manufactured products was served mainly by imports from industrialized countries, in particular from the European Union and Japan. However, the recent massive increase in demand, which has led to the sizable trade deficit for manufactures, was accompanied by a change of major suppliers. While the European Union accounted for 21 percent of manufactured imports in 2000, this share decreased to 14 percent in 2010. At the same time, Chinese manufactured imports tripled their share from 4 percent to 12 percent in 2010 and thus significantly contribute to Tanzania's import dependency. Figure 20 illustrates the changes in market share by product category.

Table 14: Top-20 dynamic imports in Tanzania (import growth>17% per annum, ranked by volume 2010)

Domestic demand (import analysis)							Substitution feasibility (export analysis)			
Rank	Code	Product Description	Technology classification	Import 2000 in US$ thousands	Import 2010 in US$ thousands	CAGR Import 2000-2010	TZA export 2010 in US$ thousands	CAGR Export 2000-2010	Export growth> Import growth	Trade balance 2010
1	334	Heavy petrol/ bitum oils	RB	287,366	2,152,950	22%	2,151	15%	no	-2,150,798
2	781	Passenger cars etc	MT	52,379	300,622	19%	2,196			-298,426
3	41	Wheat/meslin	PR	28,792	291,943	26%	70	-1%	no	-291,873
4	673	Flat rolled iron/st prod	LT	19,552	179,685	25%	799			-178,886
5	571	Primary ethylene polymer	MT	12,879	176,306	30%	715	203%	yes	-175,591
6	783	Road motor vehicles nes	MT	18,788	148,670	23%	410			-148,260
7	625	Rubber tyres/ treads	RB	19,953	134,045	21%	112	-21%	no	-133,933
8	562	Manufactured fertilizers	MT	16,557	130,811	23%	59,910	81%	yes	-70,900
9	728	Special indust machn nes	MT	17,055	120,444	22%	1,480	61%	yes	-118,964
10	575	Plastic nes-primary form	MT	9,872	100,888	26%	1,735	57%	yes	-99,153
11	676	Iron/steel bars/ rods/etc	LT	8,291	81,487	26%	10,112	43%	yes	-71,375
12	785	Motorcycles/ cycles/etc	MT	14,530	77,903	18%	254	29%	yes	-77,649
13	792	Aircraft/ spacecraft/etc	HT	7,257	77,891	27%	2,453	94%	yes	-75,438
14	699	Base metal manufac nes	LT	11,442	68,171	20%	5,302	72%	yes	-62,869
15	661	Lime/cement/ constr matl	RB	2,554	58,038	37%	26,798	26%	no	-31,241
16	786	Trailers/caravans/ etc	MT	3,169	57,054	34%	3,613	91%	yes	-53,441
17	574	Polyacetals/ polyesters	MT	6,437	56,376	24%	138			-56,238
18	523	Metal salts of inorgacd	RB	6,324	51,887	23%	896	21%	no	-50,991
19	598	Misc chemical prods nes	MT	3,303	51,377	32%	586	13%	no	-50,791
20	662	Clay/refractory material	RB	5,320	46,424	24%	6,921	163%	yes	-39,504
		Sum of top 20 products		**551,821**	**4,362,971**	**23%**	**126,650**	**38%**	**yes**	**-4,236,321**
		Total import of TZA (All products)		*1,586,433*	*8,007,729*	*18%*				

Source: UN COMTRADE

China has evidently gained substantial shares in all technology categories, while the EU has lost ground accordingly. In low-technology (labour-intensive) manufactures, South Africa and China have already become Tanzania's key suppliers, while the EU remains in the lead for more sophisticated product categories. However, China is catching up in medium- and high-technology (MHT) products and could soon replace the EU first in medium-technology and then in high-technology products if the current trend continues. As far as South Africa is concerned, its firms are not yet able to compete in more technology-intensive industries and can thus not replicate their success of selling low-technology products to Tanzania. These findings imply that competing with Chinese imports will most likely continue to be one of the key challenges for Tanzanian manufacturing enterprises in the near future.

Import substitution as an opportunity in the domestic market

Starting from the assumption that national firms should be in a better position to identify opportunities and meet the demand in their home market, a strong import dependency is difficult to comprehend at first glance. However, with globalization progressing rapidly and trade liberalization spreading across most developing regions, the new "rules of the game" enable multinational firms to easily exploit market potentials on a global scale. Consequently, the strong presence of foreign products is sometimes perceived as a threat for local manufacturers in Africa. Yet, if domestic firms do not shy away from serious investments in productive capacities and simultaneously benefit from a conducive policy environment, the chances for national competitors to emerge are high. The bottom line is that while large trade deficits can be deemed a serious threat from the macro-economic perspective, they also point to significant unused market opportunities for domestic producers.

However, not all manufactured products have the same characteristics, and it is therefore necessary to identify the most attractive domestic markets which are likely to be more suitable for an import-substitution strategy. Table 14 presents a list of the top-20 product markets that demonstrated an above-average increase of domestic demand over the last ten years, ranked by total import volume in 2010. While the listed product categories are rather diverse, the following common characteristics deserve attention:

- There is substantial demand for all these product categories in the domestic market which is currently being met by goods produced outside Tanzania.
- Domestic demand for each product category is growing by more than 18 percent annually, offering plenty of future opportunities for local producers of these goods.
- With one exception (wheat), all categories are manufactured products and ten of the twenty categories are medium-technology manufactures.

How feasible is import substitution in Tanzania?

The cumulative domestic market demand for these 20 products, which is currently being met by imports, amounts to nearly US$ 4.4 billion annually –a very attractive market volume indeed. However, even though all 20 product categories in the above table represent highly attractive markets, the feasibility for domestic firms to engage in them differs considerably. For instance, several products in the list are currently not being exported by Tanzanian firms at all, suggesting that local production is either non-existent or uncompetitive (e.g. the high-technology category of aircrafts). On the one hand, this does not exclude the respective categories from potential future production in the country, as foreign firms with the respective know-how might consider localizing their productive activities in Tanzania in the future. On the other hand, product categories that are already being produced and even exported from Tanzania today certainly offer more immediate potentials for expansion.

Judging from Tanzania's current export performance, in particular manufactured fertilizers (562), metal products (676, 699) as well as lime/cement and clay (661, 662), could offer short-term opportunities for import substitution. While a more detailed analysis of all product categories is not feasible within the scope of this report, a snapshot of the current situation in two of the identified markets provides some interesting insights. Figure 21 compares the current state of the fertilizer and cement industries in Tanzania on the basis of industrial trade data and company reports. The domestic fertilizer industry has seen some export success in Rwanda (in addition to re-exports), but its substantial import dependency is expected to further increase in the future as a result of the recent decision to expand warehouse capacities for imported products rather than domestic production. While existing exports are exclusively rock-phosphate fertilizers (with very limited domestic value addition), a substitution of currently imported urea-based fertilizers could be possible in the future if a fertilizer plant is established using the available natural gas. The Tanzanian government is currently involved in discussions on this issue with investors. As far as the cement industry is concerned, the recent

Figure 21: Comparative snapshot of the fertilizer and cement industry in Tanzania

	Domestic demand	Import dependency (importers)	Export success (export destinations)	Key industry players (origin)	Prospects for increased domestic production
Fertilizer industry	Large and rapid growth	High dependency and trade deficit still increasing (Finland, Russia)	Expansion of exports faster than imports, but few export destinations (Rwanda)	Yara (Norway – no local production); Minjingu (TZA – with domestic plant)	Expansion of distribution hub/ warehouse, but no production planned by Yara; discussions on domestic production of urea-based fertilizer underway (with available natural gas)
Cement industry	Large and rapid growth	Limited dependency, but emergence of recent trade deficit (Pakistan, India)	Continued expansion of exports, but slower than imports (Rwanda, Malawi, Burundi)	Portland, Tanga, Mbeya (all former SOEs, now foreign-owned)	ARM (Kenya) to start operation of 2 new plants in 2012 with the aim of also supplying neighbouring countries

Source: Created by the author on the basis of UN COMTRADE data and available company reports of key players

decision of a Kenyan firm to invest in local production facilities in Tanga and Dar es Salaam could help limit the emerging trade deficit and possibly also trigger export activities to neighboring countries that lack the required natural resources.

Towards competitive manufacturing for the domestic market

In summary, the Tanzanian market offers substantial prospects for both domestic and international manufacturing firms. While importers today are still the key beneficiaries of these developments, the rapidly multiplying market volumes suggest that economies of scale might soon warrant domestic production for a variety of manufactured products. If Tanzania's current economic growth spell continues in the future, the associated increase in demand for a variety of goods poses a key question for the country: how can domestic manufacturing firms learn to compete with imported products?

5.3 Opportunities in regional and global markets

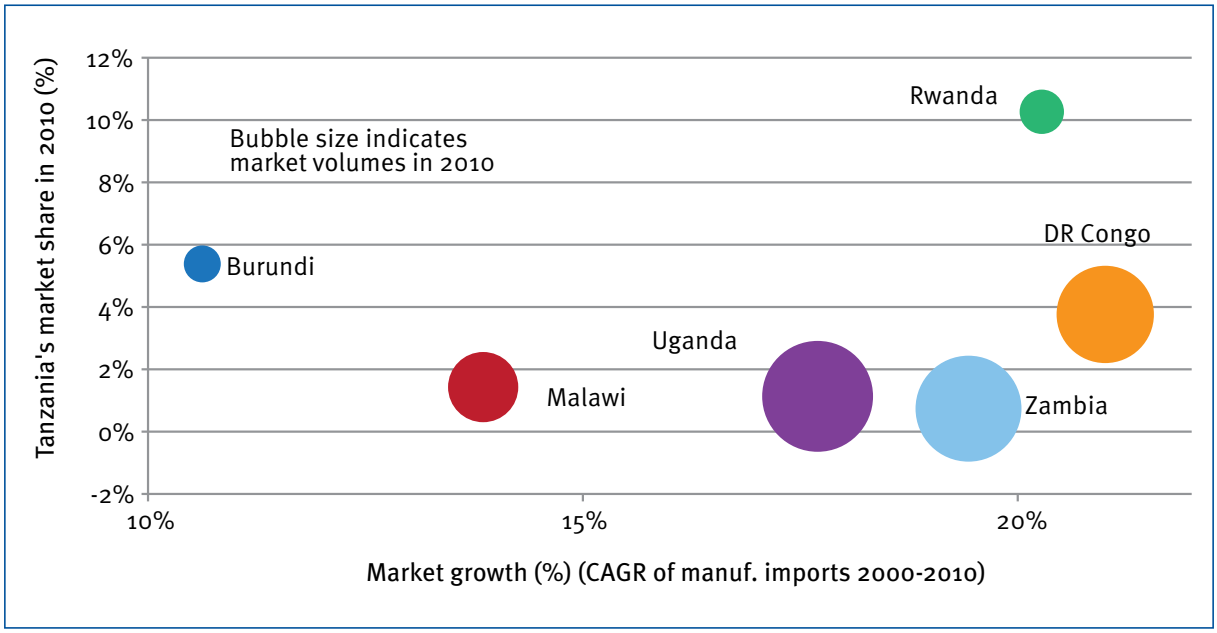
Taking advantage of new opportunities in neighboring landlocked countries

While the domestic market presents a good starting point for Tanzania's manufacturing firms, a competitive industrial sector will also aim to expand beyond the national sphere. In this regard, Tanzania's strategic geographical location can offer additional opportunities. In particular, the growing markets for manufactured goods in the neighboring landlocked countries appear highly attractive for several reasons:

- These countries have no access to the sea and therefore rely entirely on foreign ports for the import and export of goods.
- Given their relatively early stage of industrialization, most of these countries still lack strong national products/brands in a range of industries.
- In several cases, they lack the resources required for the production of certain manufactured products.

Figure 22 compares the current markets for imported manufactured products in the landlocked countries which share a border with Tanzania and could therefore act as the "backyard for Tanzanian industry" in the future. Our analysis shows that all these markets could be attractive for a number of reasons. To begin with, larger countries like Zambia, Uganda and DR Congo have the most sizeable and rapidly expanding markets. In fact, their joint imports of manufactures amounted to more than US$ 12 billion in 2010 and are expected to further rise in the medium run, considering

Figure 22: Markets for manufactured products in Tanzania's landlocked neighbours, 2000-2010



Source: UN COMTRADE

Note: DRC & Rwanda with mirrored data

that imports are growing at an average rate of 18-21 percent per year. However, Tanzania's market share is still negligible, in particular in Uganda and Zambia, but also in the smaller Malawian market, suggesting that firms are still struggling to exploit these opportunities. In this respect, the markets in Rwanda and Burundi can be deemed highly attractive despite their significantly smaller size. In both countries as well as in DR Congo, Tanzanian products already have a higher presence, making further expansions a slightly easier task.

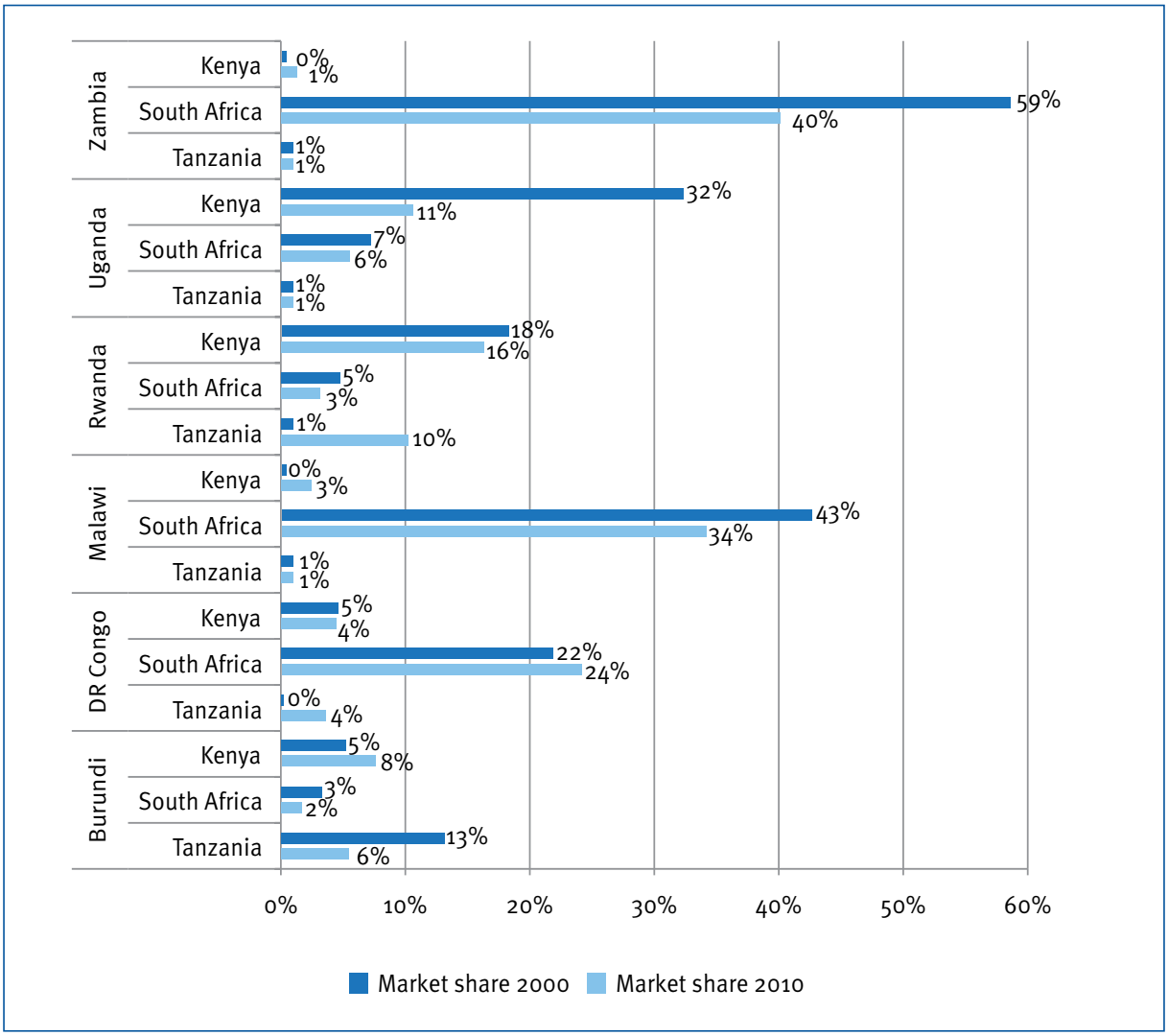
In short, our analysis indicates that the individual markets have very different characteristics and dynamics and, accordingly, call for tailor-made exploitation strategies in the future. While it might suffice for the already relatively well-established Tanzanian firms in Rwanda and DR Congo to benefit from rapidly increasing demand, a full-fledged market entry in Uganda and Zambia is not very likely to be feasible without substantial additional efforts. Detailed market entry strategies would obviously require a more disaggregated analysis at the product level. While this is not within the scope of this report, the respective data is readily available in the UN COMTRADE database and, if required, can be analysed in the future.

Competing with South Africa, Kenya and China in regional markets

While the above analysis points to several attractive market opportunities in Tanzania's landlocked neighbours, Tanzanian firms will have to compete both with national and international players to exploit these potentials. In this respect, the previous chapter on regional integration and industry has already highlighted the fact that Kenya is a strong competitor in EAC and a similar analysis for SADC suggests that the same holds true for South Africa in the southern region. In addition, China is capturing increasing shares of the Tanzanian market as well as in the surrounding countries. Accordingly, the key question is whether Tanzania is ready to compete with these heavyweights, which are actively marketing their manufactured products in the region. Figure 23 depicts the competitive threat Kenya and South Africa presently poses to Tanzanian industry, considering all regional markets analysed above.

The key finding of this analysis is that Tanzania is currently not ready to assume the leading role in any of the markets, as it falls behind both Kenya and South Africa in most cases. A sizeable market share places Tanzanian firms in front of South Africa's – yet behind Kenya's – only in the smallest regional markets of Rwanda and Burundi. In fact, geographic proximity evidently plays an important role for market success. While South African products dominate in the Zambian, Malawian and Congolese (DRC) markets, Kenya is the stronger competitor in Uganda, Rwanda and Burundi. The only markets where Tanzania has been able to increase its market share considerably in the last decade are Rwanda and DR Congo.

Figure 23: Comparison of market shares for manufactured products in landlocked neighbours, 2000-2010



Source: UN COMTRADE

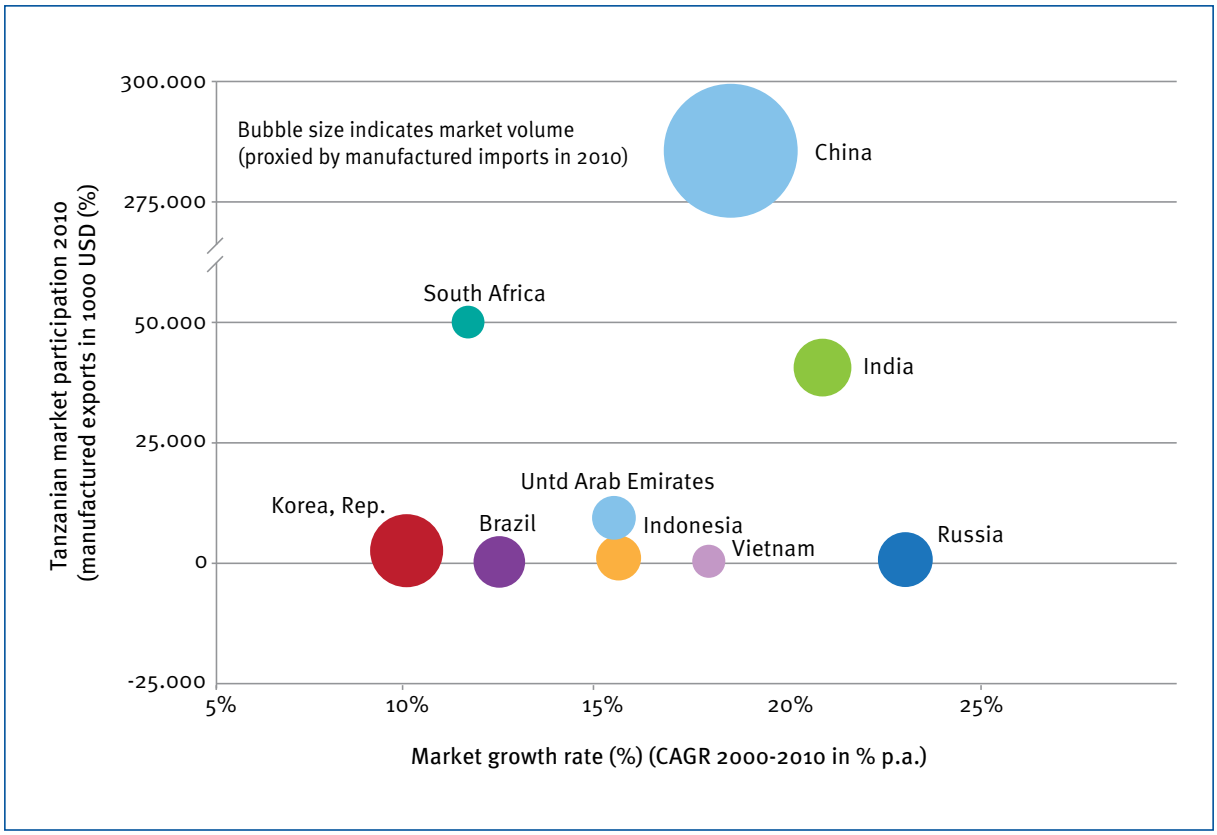
Note: DR Congo and Rwanda with mirrored data

At the same time, China is also increasing its market presence in Tanzania's landlocked neighbours. In particular in Burundi and Malawi, the impact of Chinese manufactured imports has tripled in the last decade, capturing a 13 percent and 11 percent market share, respectively, in 2010. As this trend is expected to continue in the foreseeable future, Tanzanian firms will increasingly need to find ways to compete with new Chinese goods in addition to the established Kenyan and South African products. In summary, our findings show that Tanzanian manufacturers are not yet able to fully benefit from their attractive geographical location. The high degree of regional competition also suggests that considerable efforts are needed to improve Tanzania's industrial competitiveness in order to exploit the sizable market opportunities in the future.

China is the key emerging market for Tanzanian industry today

While the national and regional market opportunities analysed thus far are highly relevant for Tanzanian firms due to their proximity and accessibility, more distant markets may be attractive if they offer larger volumes and higher growth rates which warrant the additional costs of supplying them. However, these emerging markets usually attract a large number of suppliers from various countries, making competition a market-entry barrier that should not be underestimated. Accordingly, the Tanzanian manufacturing sector needs to determine which specific markets are most relevant at present in order to focus its activities on a few key locations. Figure 24 presents an analysis of the three factors that are highly relevant for this:

Figure 24: Tanzania's share in selected global emerging markets for manufactures, 2000-2010



Source: UN COMTRADE

- The current size of demand for manufactured imports
- The growth dynamics of the markets
- The current success of Tanzanian manufactures in the respective markets.

The key finding of our analysis is that Tanzania is not yet exploiting the tremendous opportunities that emerging markets offer. China is by far Tanzania's most critical market today, buying Tanzanian manufactures with a combined value of almost US$ 300 million in 2010. Given the fact that China is not only the largest but also one of the fastest growing global markets for manufactures, it will certainly offer plenty of new opportunities for Tanzanian firms to further increase their exports in the near future. However, apart from the difficulties associated with expanding in China, it is also more than questionable whether Chinese demand alone will suffice to drive Tanzanian industry in the future. Accordingly, opportunities in other emerging markets should be explored to reduce the dependency on the Chinese market.

Beyond China: Exploring emerging markets for manufactures globally

Section B of this report highlights the vulnerability that a high reliance on a very small number of target markets implies for Tanzanian industry. In this respect, it is important to note that China is one of only three emerging markets that Tanzania has been able to exploit in a meaningful way so far. Interestingly, South Africa, despite being a smaller and less dynamic market, ranks second in terms of Tanzania's export success with exports of US$ 50 million, followed by India with US$ 40 million. The fact that Tanzanian products are of minor relevance for all of these markets increases the country's vulnerability further. As Tanzania accounts for an almost negligible share of Chinese, Indian and South African manufactured imports, it is relatively easy for these countries to substitute Tanzanian goods with products from other countries. In addition, a small decrease of demand from any of these three countries will have substantial negative effects on Tanzanian industry. A more diversified export pattern with more target markets would obviously reduce this threat significantly.

In view of this, the most revealing finding relates to the other emerging markets for manufactures identified in the analysis above. Their fast growth rates imply an opportunity for Tanzania to capture the new demand that is emerging. However, despite their large market sizes and rapid demand growth, Tanzania has not yet been able to successfully enter these markets. Accordingly, the time has come for Tanzanian industry to look beyond the classical target markets. In Asian growth markets in particular (Republic of Korea, Thailand, Indonesia and Viet Nam) as well as in Russia and Brazil, market opportunities for Tanzanian manufactures should be carefully monitored and explored in the future.

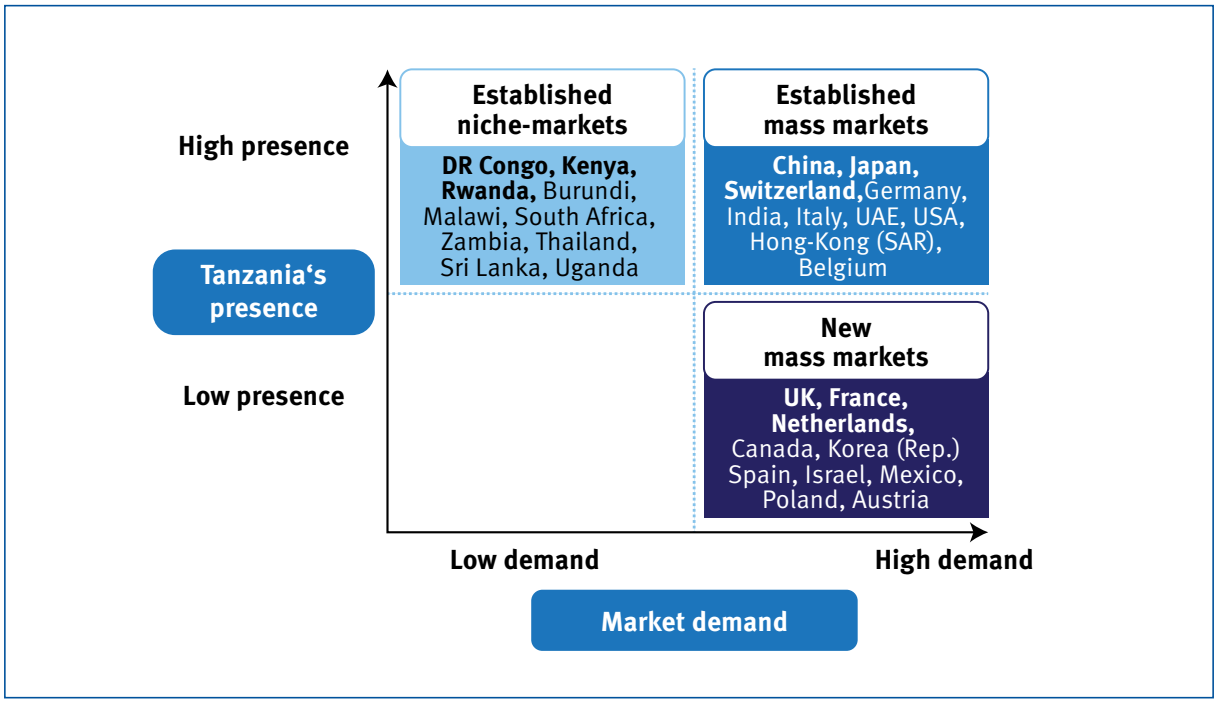
Starting global expansion with resource-based manufactures

The above analysis has pointed to several attractive market opportunities in Tanzania's direct vicinity as well as in the fastest growing markets at the global level. The focus is on the growing demand for manufactured products that Tanzanian industry could take advantage of in the future. However, with so many opportunities available, which is the best starting point for Tanzania? Section B has shown that Tanzanian exports today are a rather limited variety of manufactures which mostly belong to the resource-based category. While a diversification into products with higher value addition is indeed a critical challenge in the medium to long run, the focus on resource-based manufactures will most likely prevail in the short run. Accordingly, one of the least challenging ways for Tanzanian industry to boost its export competitiveness is to target those global markets that have considerable demand for these products. While this does not mean that resource-based manufactures should be the only industrial activity Tanzania ought to pursue, it can be a good starting point for global expansion.

Tanzanian industry needs to access additional global mass markets

While Tanzania is already successfully exporting resource-based manufactures, it is still highly dependent on one target market: China. However, other countries are also showing a large and growing demand for the products Tanzania has to offer, opening a window of opportunity for a market diversification strategy for Tanzanian industry. In that sense, Figure 25 illustrates the key markets for products that

Figure 25: Markets for Tanzania's top-10 resource-based manufactured exports, 2010



Source: UN COMTRADE

Note: Selection of top-20 largest existing markets for Tanzania as well as top-20 largest markets globally. Definitions: 1. Established niche markets: Key market for TZA but not in the world. 2. Established mass market: Key market for TZA and the world. 3. New mass markets: Key market in the world, but not for TZA.

Tanzania is already successfully trading. A look at the top-ten resource-based manufactures that Tanzania is exporting today provides an analysis of world demand as well as of Tanzania's market presence.

On the one hand, the analysis suggests that Tanzania is already active in a number of the largest world markets. However, in terms of export success, very few markets matter. In fact, China, Japan and Switzerland account for more than 76 percent of Tanzanian exports of such products. In addition, Tanzania has a comparatively strong presence in some (mostly African) niche markets which, however, only account for very small shares of world demand and accordingly offer limited potentials. In fact, the cumulative demand of Tanzania's ten established niche markets listed in Figure 25 amounts to only one-fifth of the Chinese demand for these products. In contrast, several global mass markets which have a huge demand for the resource-based manufactures Tanzania produces have not yet been exploited to a large extent. In particular, some EU markets (UK, France, Netherlands, Spain, Poland, Austria) as well as Canada, Republic of Korea, Israel and Mexico are likely to offer significant market opportunities, as they are already major importers of the same products from Tanzanian competitors.

Exploiting opportunities and withstanding competition

This chapter has provided an analysis of the market opportunities of Tanzanian industry both at home and abroad. The key finding is that a lack of demand for manufactured products is very unlikely to be a root cause for Tanzania's limited industrialization success thus far. In fact, the domestic market for manufactured goods today already is substantial and continues to expand rapidly. In addition, some of Tanzania's landlocked neighbouring countries offer further opportunities to increase this market even more – not to mention the major emerging markets that are at present driving global demand for manufactures. Accordingly, the real challenge is two-fold: 1) Tanzanian firms do not offer competitive products to meet existing national and regional demand, and 2) regional (Kenyan, South African) as well as international rivals dominate the competition.

The competitiveness of Tanzanian manufacturing firms depends on a range of factors. Arguably, the human resources available for industry are one of the most crucial determinants in this respect. While industrial policy could look at various areas of intervention, an upgrading of the Tanzanian workforce is likely to be a key factor for long-term success. The following chapter will provide some insights into this aspect.

6. Modern skills for industrial development

6.1 Industrial skills and structural transformation

Industrial skills and competitiveness

Countries' industrial competitiveness depends on many factors, 'ultimately perhaps the most important single determinant is the level and improvement of workforce skills at all levels' (Lall, 1999:2). In particular, least developed countries aiming at increasing productivity in the traditional agricultural sector and catching up in the manufacturing industries cannot simply rely on natural resource abundance or traditional competitive factors such as low cost unskilled labour. In the new global competitive landscape, these factors can be used as part of an entry-level strategy for the short term. However, alone by increasing their industrial skills and production capacities, countries will become able to process natural resources and diversify into higher return agricultural and industrial products (Chang and Lin, 2009; Noman et al., 2012; MKGI, 2012; Andreoni, 2013). If countries are to enhance their industrial competitiveness, that is, increase their presence in international and domestic markets while developing their industrial sectors and activities with higher value added and rising wages, they have to develop:

- more skills,
- higher level skills and
- different kinds of skills.

The reason why skills development is one of the main drivers of countries' structural transformation becomes evident when we look at companies' technological efforts at the shop floor level. For firms, the possibility of capturing new production opportunities that arise in global markets, introducing new production practices or selecting alternative technologies critically depends on the domestic availability of relevant industrial skills. Relying on their workforce skills, firms engage in costly and prolonged learning processes whereby production activities are eventually upgraded, the value of production output is increased and, ultimately, overall firm-level technological capabilities are developed (Lall, 2001; Andreoni, 2011; Toner, 2011). Thus, skills are the main determinants of production and technological capabilities development at the firm level as well as the main complements to a firm's investments in equipment, machines and other capital goods.

Structural transformation is only possible with the right industrial skills base

The historical experiences of countries that were able to move from simple to complex technologies, testify that engaging in more complex production activities generally leads to capturing higher value and generates spillover benefits to local input-supplying businesses within and across industries (Chang, 2002; Cimoli, Dosi and Stiglitz, 2009). The more complex production activities and technologies are and the more costly they are to master, the more countries will have to boost skills development and provide businesses with an appropriately skilled workforce. Thus, the need to increase the quantity, quality and range of domestically available skills goes hand in hand with the structural transformation of the national production system, in particular its manufacturing base (Myrdal, 1958).

In fact, the improvement of workforce skills is the main trigger of countries' structural transformation as well as one of its main outcomes. Specifically, technological deepening processes within domestic and foreign companies create new demand for an increasing number of higher-skilled workers and generate new resources for improving the education and vocational school systems. The government in collaboration with business plays a fundamental role in this regard, that is, it drives the cumulative self-reinforcing process of skills development and structural transformation by investing increasing tax revenues in the education and vocational school systems (Noman et al., 2012; World Bank, 2012a).

Investigating industrial skills in Tanzania

Understanding if and to what extent Tanzania's current *skill supply* matches *skill demand* from foreign and domestic companies, especially in manufacturing, is a critical policy question. To be effective, skills policies must be evidence-based and build on information about current workforce skills, specific skills needs and gaps as well as the technological capabilities available within firms (Borghans et al., 2001; Andreoni, 2011). Consequently, the Government of Tanzania

and UNIDO conducted an *Industrial Skills Survey* in 2011, which targeted 167 businesses in Tanzania, 86 percent of which are in the manufacturing sector.[8] On the supply side, the skills matching analysis was supported by a curriculum survey previously carried out by UNIDO (2010) and a set of interviews conducted with representatives from major education institutions (see the last section of this chapter).

Measuring the mismatches of demand and supply of industrial skills

The skills matching problem is particularly difficult to tackle in least developed countries, where the education and vocational school systems are still in an early stage of development and are thus still not fully responsive to skill demand (Barro and Lee, 1996; Oyelaran-Oyeyinka, 2006). Mismatches between skill demand and skill supply can manifest in three main forms:

- **Skills quantity and quality** (i.e. shortage of skills within companies, both in quantitative and qualitative terms);
- **Skills misallocation and skills gap** within companies;
- **Skills availability and formation** (i.e. lack or under-production of relevant skills by the education system and lack of coordination between the education and the production system).

Given this taxonomy, specific diagnostics have been developed and applied to the sample of Tanzanian businesses to evaluate the current situation of both skill demand and supply (see Box 12).

All these matching problems have an inherent dynamic character. In other words, skill supply and demand have to be coordinated over time by responding to the current needs of both domestic and foreign companies, yet also bearing in mind the need to match future skills needs. Skills cannot be built in a day; their development requires long-term investments in learning processes and institution building. Thus, today's skill supply must match today's and tomorrow's skill demand, as the successful cases of Singapore and the Republic of Korea have shown (Ansu and Tan, 2012). These considerations call for a rethinking of current education policies as a fundamental lever in the broader industrial policy agenda.

Box 12: Diagnostics to measure industrial skills in Tanzania

- **Skills quantity and quality**: First of all, the mix of high, medium and low skills in a company's (or group of companies with similar characteristics) workforce denotes the company's ***skills intensity***. Secondly, the presence of education-based skills such as literacy, numeracy and IT skills in a company provides insights on the workforce's ***skills content***. Although the available skills in the workforce might be quite low, they might suffice for performing production activities within companies (*task sufficiency*). Finally, as for the availability of higher skills, they might or might not match companies' expectations and might or might not be adequate for performing certain production functions (*skills adequacy*).
- **Skills misallocation and gap**: Different workforce skill levels might be employed by firms in such a way that they are not fully exploited given the specific job requirements (***skills misallocation***) This is particularly problematic in countries with a significant gap between the actual share of tertiary educated workers in companies and the desired share of such workers (***higher skills gap***). The higher skills gap signals both a quantitative as well as qualitative lack of specific types of tertiary educated workers, that is, those with a degree in science, technology, engineering or mathematics (STEM).
- **Skills availability and formation**: Companies might find it particularly difficult to find specialized higher skilled workers (***skills availability***), either because there is a lack of supply of appropriate skills or due to insufficient collaboration with universities and to the fact that the curricula tend to not match job requirements.

Compare also Andreoni 2013

8 The technological composition of the company sample roughly reflects the sectoral composition of the Tanzanian economy. The survey indicates the perception of company owners/managers regarding the skill levels of their employees.

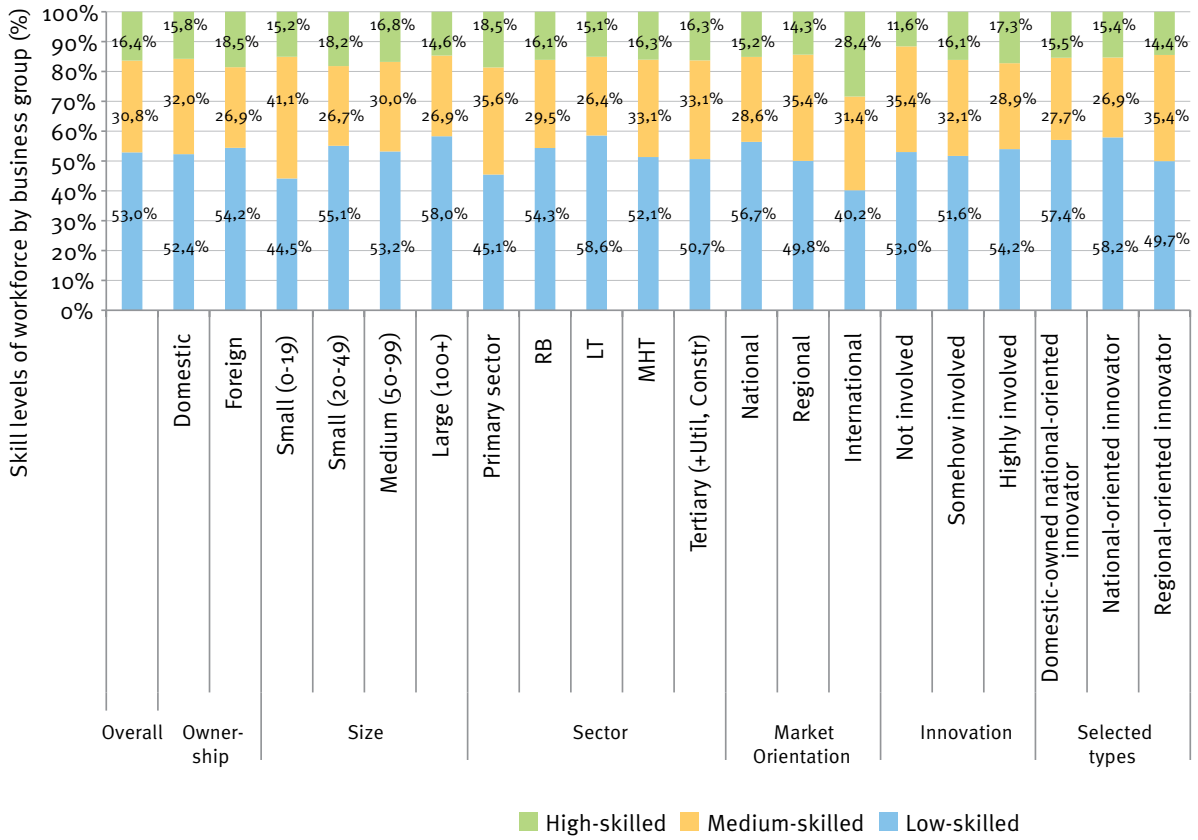
6.2 Measuring industrial skills in Tanzania

Skills intensity: exporters, FDIs and innovative firms require higher skill levels

Skill intensity denotes the mix of high, medium and low skills of a company's workforce. The larger the share of workers with higher skills in any given company, the higher its skill intensity. In Tanzania, more than half of the workers of an average company are low skilled, nearly one-third is medium-skilled and only 16 percent are high skilled. These shares differ when various company groups are considered (Figure 26). When companies are divided according to their market orientation, we clearly see that those serving foreign markets have an increased share of medium- and high-skilled workers. Furthermore, foreign-owned companies tend to employ slightly more high-skilled workers. The fact that foreign-owned and export-oriented businesses can play a key role in capturing internationally available technologies and in triggering up-skilling and multi-skilling processes is well known. Countries such as Singapore and Malaysia have benefitted tremendously from actively managing FDI-led targeted strategies. At the same time, the development trajectory followed by countries such as Republic of Korea and Taiwan, ROC has also demonstrated how a strategy promoting export-oriented domestic firms can increase national learning capabilities (Lall, 2001).

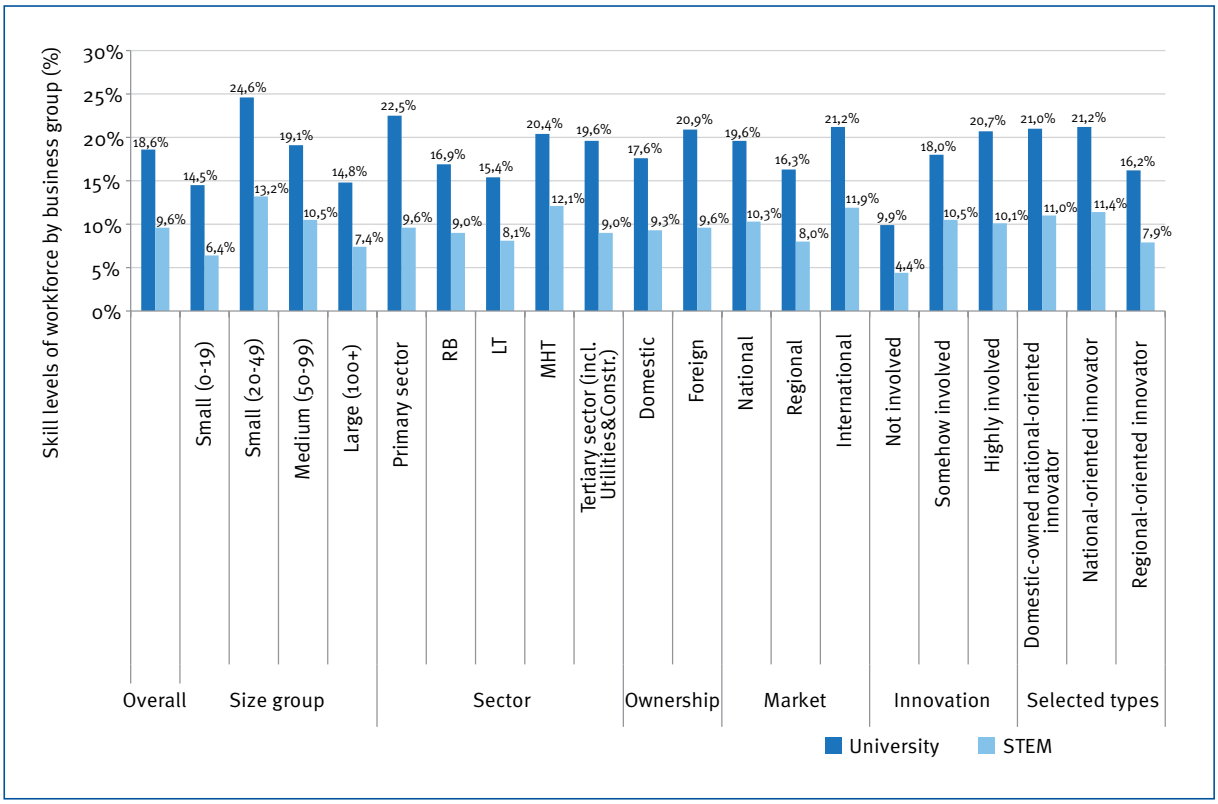
The analysis also confirms that the specific industry a company is involved in plays an important role. On the sub-sector level within manufacturing, the lowest relative share of high-skilled workers and the highest relative share of low-skilled workers are found in low-technology manufacturing companies. In terms of 'innovation propensity', businesses involved in some form of product or process innovation also employ relatively more high-skilled workers than businesses not engaged in innovation. This confirms the intuition that the diversification of Tanzania's manufacturing sector towards higher value addition and higher technology intensity is only possible if the skills base is increased.

Figure 26: Skill levels of workforce in various business groups (mean values)



Source: GoT & UNIDO Industrial Skills Survey 2011

Figure 27: Share of workers with a university/STEM degree by business group



Source: GoT & UNIDO Industrial Skills Survey 2011

Demand for tertiary educated workers also varies between business groups

In addition to the above finding, 'innovation' and 'technology' effects can also be determined by looking at the number of university graduates in the workforce: innovation-oriented businesses employ twice as many university graduates, in particular STEM graduates, than businesses that are not innovation-oriented, while medium- and high-tech companies generally employ a larger share of university graduates as illustrated in Figure 27. Overall, one fifth of the average company's workforce consists of university graduates, but only half have a STEM degree.

The low-skill content of the workforce is insufficient for fostering industrial development

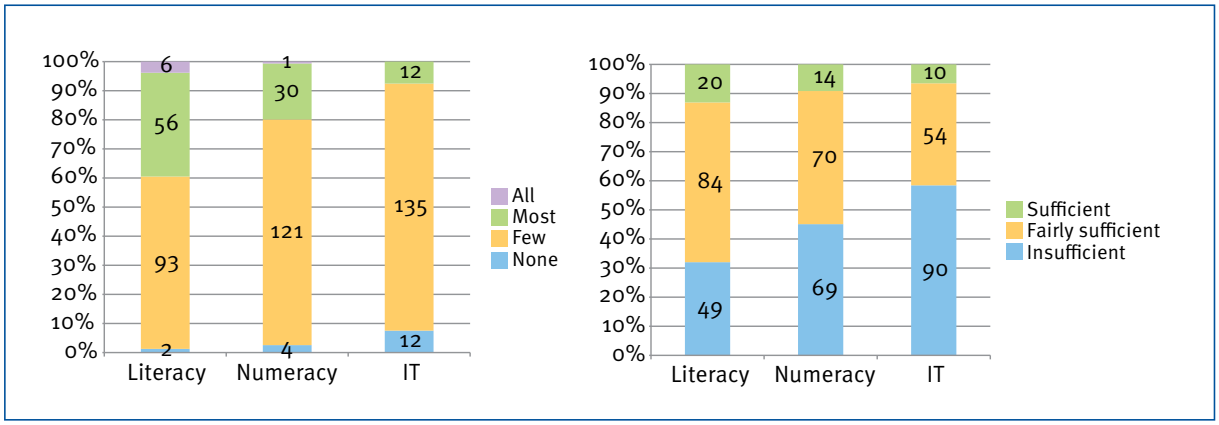
Companies' endowment of skills can be assessed objectively and in more detail by looking at the presence of specific basic skills such as 'literacy' and 'numeracy' or more advanced ones such as 'information technology' (IT) skills. Based on our analysis of the current skills content of the workforce in Tanzanian businesses, a number of worrying signs emerge (Figure 28):

- Almost two-thirds of respondents claim that none or few of their workers are literate,
- 80 percent claim that none or few of their workers are numerate, and
- Nine out of ten respondents state that none or few of their workers have IT skills.

While the lack of IT skills is to some extent understandable, considering that computers are not required for a number of activities in Tanzanian firms, the results for literacy and numeracy are surprising. Illiteracy implies inability to follow written instructions or to understand blueprints, while the lack of numeracy skills at the shop floor level makes the introduction and effective use of modern machines and equipment extremely difficult. Moreover, a lack of basic skills in the workforce tends to reduce the effectiveness of in-firm training, especially when the company seeks to move from simple to more complex production functions.

Given the fact that the great majority of Tanzanian businesses are resource-based or engaged in low-tech manufacturing, it is not surprising to find that the

Figure 28: Skill composition and skill sufficiency in Tanzania



Source: GoT & UNIDO Industrial Skills Survey 2011

Note: The numbers in the bars represent the frequency for each group

share of workers who possess core skills is 'sufficient' to satisfy companies' current production needs as illustrated in the right hand figure above. In fact, only one-third of the businesses state that the share of literate workers in their company is insufficient. However, task sufficiency decreases when we look at numeracy, with nearly half of the companies claiming that their workers' numeracy skills are insufficient. Sixty percent of the firms assert that their workers' IT skills are insufficient, suggesting that this is the most pressing challenge at the moment.

However, the finding that the share of skilled workers is sufficient to perform current production tasks does not mean that current production practices will improve or that the businesses will be able to diversify into higher value products. Diversifying critically depends on changing and increasing the workforce's skills content. Thus, businesses need to prepare and adjust their internal skills base based on their future business plans and the market opportunities arising in domestic and international markets. This calls for various forms of collaboration with the education system and the government to define skills needs and quality standards.

Higher skills adequacy: the tertiary educated workforce in Tanzanian industry

The issue of skill sufficiency becomes even more problematic when it comes to higher skills, that is, education-based skills typically acquired through tertiary education programmes. Identifying specific weaknesses among university educated workers allows selecting and prioritizing particular areas of intervention in the education system, for example, in the reformulation of curricula and teaching methods.

In our skills survey, respondents were asked to evaluate their university educated workers along 11 dimensions, each dimension representing a different skill type. We arrived at the following findings (Figure 29):

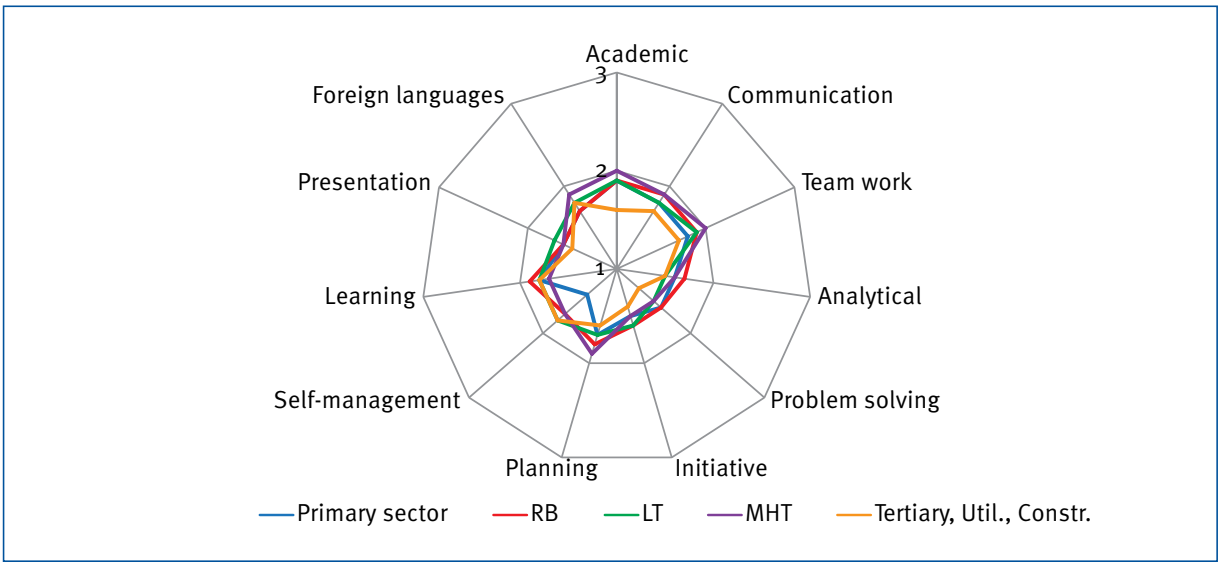
- On average, managers were more satisfied with their workers' academic, learning, communication and team work skills, and less satisfied with their workers' presentation, problem solving, initiative and analytical skills.

- When dividing these ratings by company size, large businesses are less satisfied with the level of skills of their university educated workers in almost all dimensions. Such companies run higher-scale production processes which require organizational capabilities. They also tend to employ bigger and sometimes more complex machines and equipment.

- The lowest level of skills adequacy among workers with a university education, particularly in terms of problem solving, initiative and analytical skills, is found in medium- and high-tech manufacturing companies and in businesses of the tertiary, utility and construction group.

With regard to the level of skills of STEM graduates working in companies, the majority were rated as having modest (41 percent) or fair skills (33 percent), while the skills level of only one-tenth were considered good (almost none of the workers' with a tertiary education were rated as having very good skills). Moreover, one out of three managers claimed that the company's STEM workers have no understanding

Figure 29: Satisfaction with skills of tertiary educated workers by sector (3=high satisfaction)



Source: GoT & UNIDO Industrial Skills Survey 2011

of innovation, while nearly three-quarters report that they have a 'fair understanding' of innovation. Hardly any respondent attributed a 'full understanding of innovation' to his/her STEM workers. Finally, companies express particular concern about a set of issues that make STEM graduates particularly costly:

- a lack of experience and technical knowledge,
- the need for re-training and long practical in-work training,
- low levels of work commitment, and
- relatively high wages.

6.3 Skills misallocation and gaps

Skills misallocation: high-skilled workers often do not meet job requirements

Increasing their skills intensity and the overall quality of their skilled workforce is clearly firms' favored path towards higher productivity, technological deepening and diversification. However, as skills are scarce and skills development is costly, it is crucial for companies to not misallocate them in the organization of production processes. On the one hand, firms might employ the workforce's range of skills in such a way that they are not being fully utilized, given the specific job requirements. On the other hand, especially in the case of a shortage of skilled workers, the workforce's competencies might be well below the specific job requirements. This can result in low productivity in certain production stages, the emergence of bottlenecks affecting overall production processes or, ultimately, low quality of the final output.

Tanzanian companies had mixed results (Figure 30):

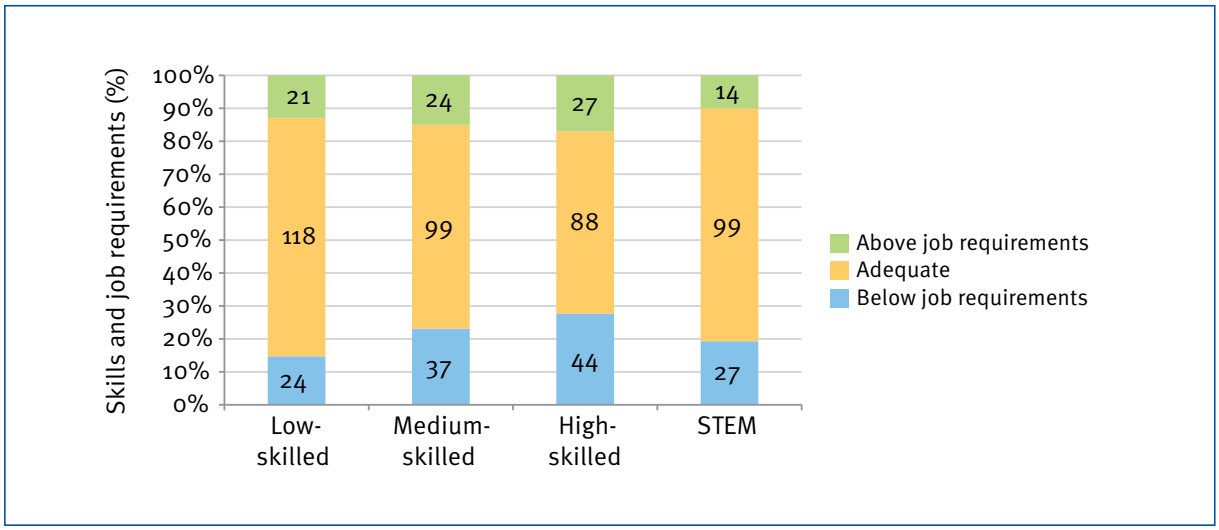
- Nearly three-quarters of low-skilled workers can adequately perform their jobs, while the skills of only 15 percent of the workers are inadequate to meet the requirements of their job.

- The share of medium- and high-skilled workers as well as STEM graduates whose level of skills is adequate to meet the job requirements is smaller. When looking at the skills level of high-skilled workers, only half possess the necessary skills to meet their job requirements; while more than a quarter of workers have inadequate skills to meet the requirements of their job, nearly one-fifth of the workforce is overqualified, i.e. in other words, their skills are not utilized properly.

Higher skills gap: manufacturing firms need more university graduates to expand

Firms continuously endeavor to improve their production processes, operations and quality standards. Their survival and chances to grow – ultimately their competitiveness – depend on how successfully they deal with production challenges. This is why firms are usually well aware of the extent and specific types of higher skills they currently lack. In other words, they have local and direct knowledge of the 'skills gap', that is, of those skills they need

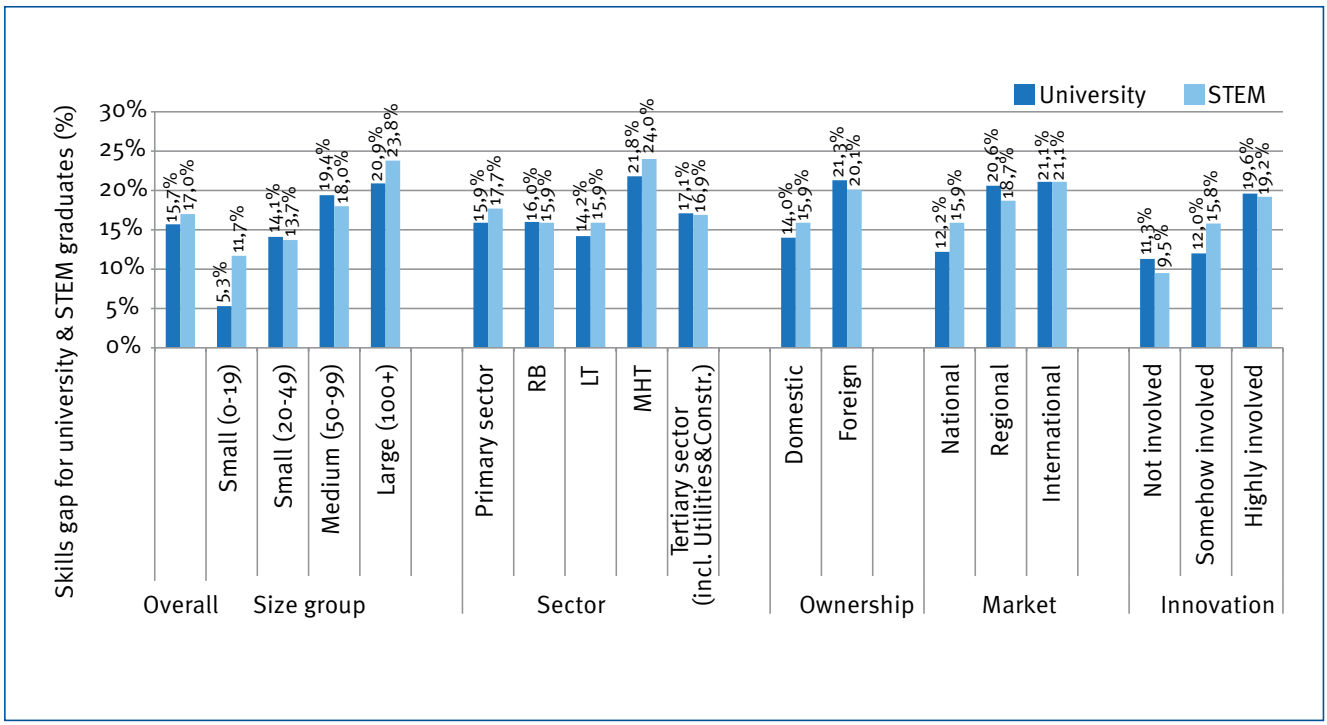
Figure 30: Skills and job requirements: a misallocation?



Source: GoT & UNIDO Industrial Skills Survey 2011

Note: The numbers in the bars represent the frequency for each group

Figure 31: Skills gap for university & STEM graduates

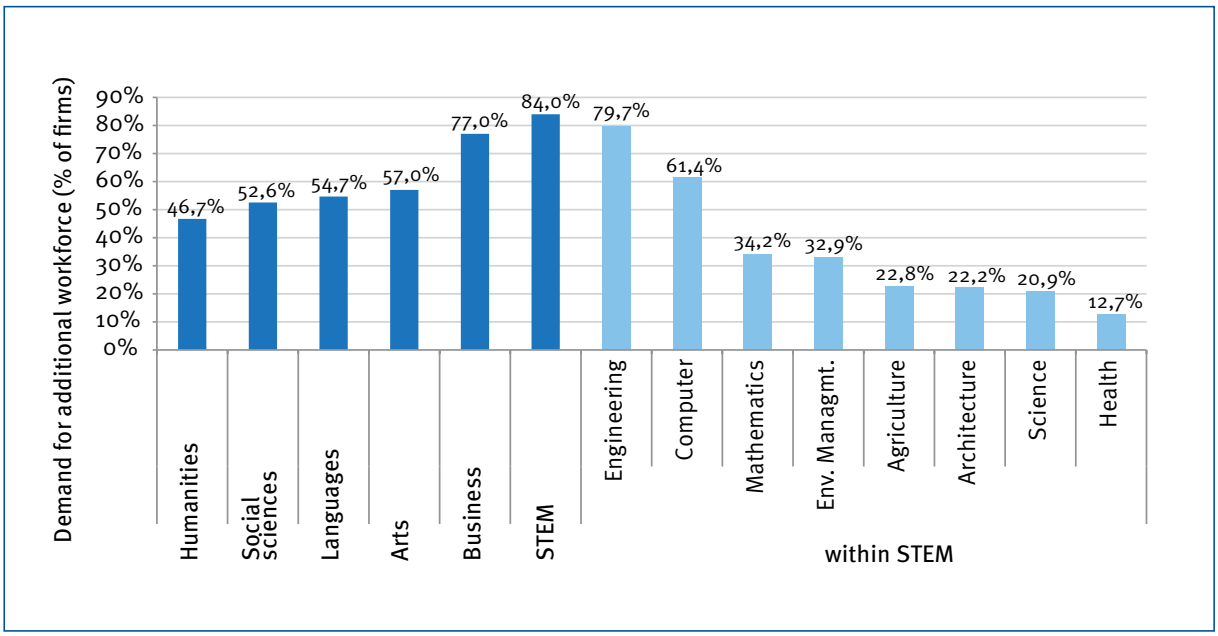


Source: GoT & UNIDO Industrial Skills Survey 2011

to overcome current production constraints. Based on our company sample, the proportion of university educated workers is, on average, 15.5 percent higher than the current share of the workforce. The higher skills gap amounts to 17 percent for STEM graduates (Figure 31).

The skills gap between the actual and the required share of tertiary educated workers varies considerably across business groups and types. First, the larger the company, the larger the gap: small companies want to increase their share of university educated workers by only 5 percent, while large companies want this

Figure 32: Demand for additional workforce according to academic background



Source: GoT & UNIDO Industrial Skills Survey 2011

share to increase by more than 20 percent. This 'size effect' is higher for STEM graduates. The skills gap is largest in medium- and high-tech sectors, confirming the 'technological effect' the skills intensity analysis uncovered. Not surprisingly, companies that are extensively involved in innovation also report the largest gap, which implies that their innovative activities cannot unfold properly as a result of the lack of relevant (higher) skills.

Manufacturing companies need more engineers and computer experts

Concerning the higher skills gap between the actual and required share of tertiary educated workers, it is worthwhile looking at which academic fields graduates are required from most (Figure 32). It turns out that the vast majority of companies (84 percent) are seeking to recruit more graduates from the STEM fields, closely followed by business graduates. Over three-quarters of companies are seeking graduates with an engineering degree, closely followed by those with a degree in computer science. Demand for graduates from other non-STEM academic fields such as arts, languages, social sciences and in particular humanities is relatively lower, nevertheless, about half of the companies is seeking to recruit graduates from these fields.

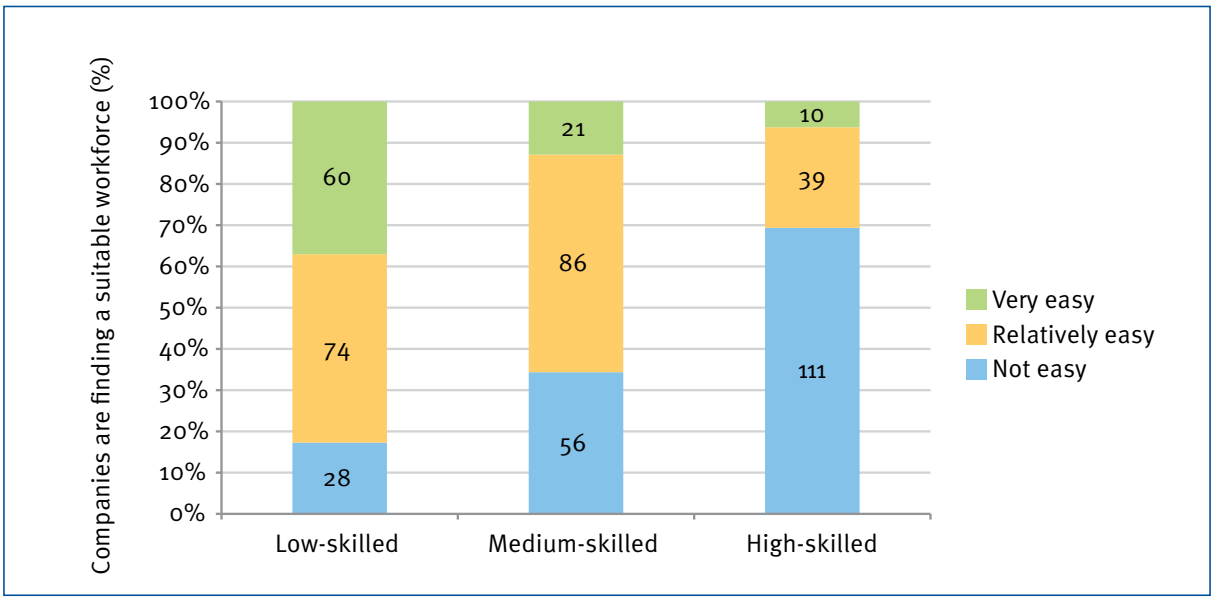
The skills gap analysis enables identification not only of the quantitative gaps, but of the qualitative ones as well, that is, those specific graduate types that are particularly relevant for the structural transformation process of a catching-up economy. In this respect, the demand for higher skills by Tanzanian companies reflects their goal to upgrade production processes and to climb the technological ladder towards a middle income country status. A skills gap analysis was recently carried out (Moyo et al., 2012) on the share of low-, medium- and high-skilled workers that is necessary as a percentage of the working population for Tanzania to reach middle income status. Based on the Integrated Labour Force Survey conducted in Tanzania in 2006 and on a benchmark model of medium income countries (MMIC), Moyo et al.'s findings are similar to those of the UNIDO Industrial Skills Survey:

- The occupational categories in need of a higher proportional share of workers are those for which higher skills are required and, in particular, those categories linked to STEM degrees.

- Taking the MMIC as a benchmark, Tanzania needs to almost triple the number of technicians and increase the number of professionals six-fold (as a percentage of the working population).

- If Tanzania is to reach middle income status by 2025, nearly 300,000 engineers, architects and related technicians will be required, along with up to 90,000 physical scientists and related technicians and 70,.000 life scientists and related technicians.

Figure 33: Finding a suitable workforce



Source: GoT & UNIDO Industrial Skills Survey 2011

Note: The numbers in the bars represent the frequency for each group

- Supporting an industrial middle income country structure will also require a massive increase in administrative and managerial positions by nearly 430,000.

6.4 Skills availability and formation

Skills availability is very low for Tanzanian manufacturers

The labour market in sub-Saharan African countries presents many complexities (Ansu and Tan, 2012). On the one hand, given the relative underdevelopment of the education system at all levels, there is a significant shortage of appropriate skills in the workforce, especially of higher level skills. The case may be that the skill supply does not meet the companies' skill demand for quantitative or qualitative reasons. The case may also be that the geographic distribution of workers in the country does not match companies' location or that the most suitable graduates are attracted by better job opportunities and higher wages abroad and are thus not available to domestic companies. Some workers may eventually take up jobs for which they are overqualified or end up working in the informal sector (another form of misallocation).

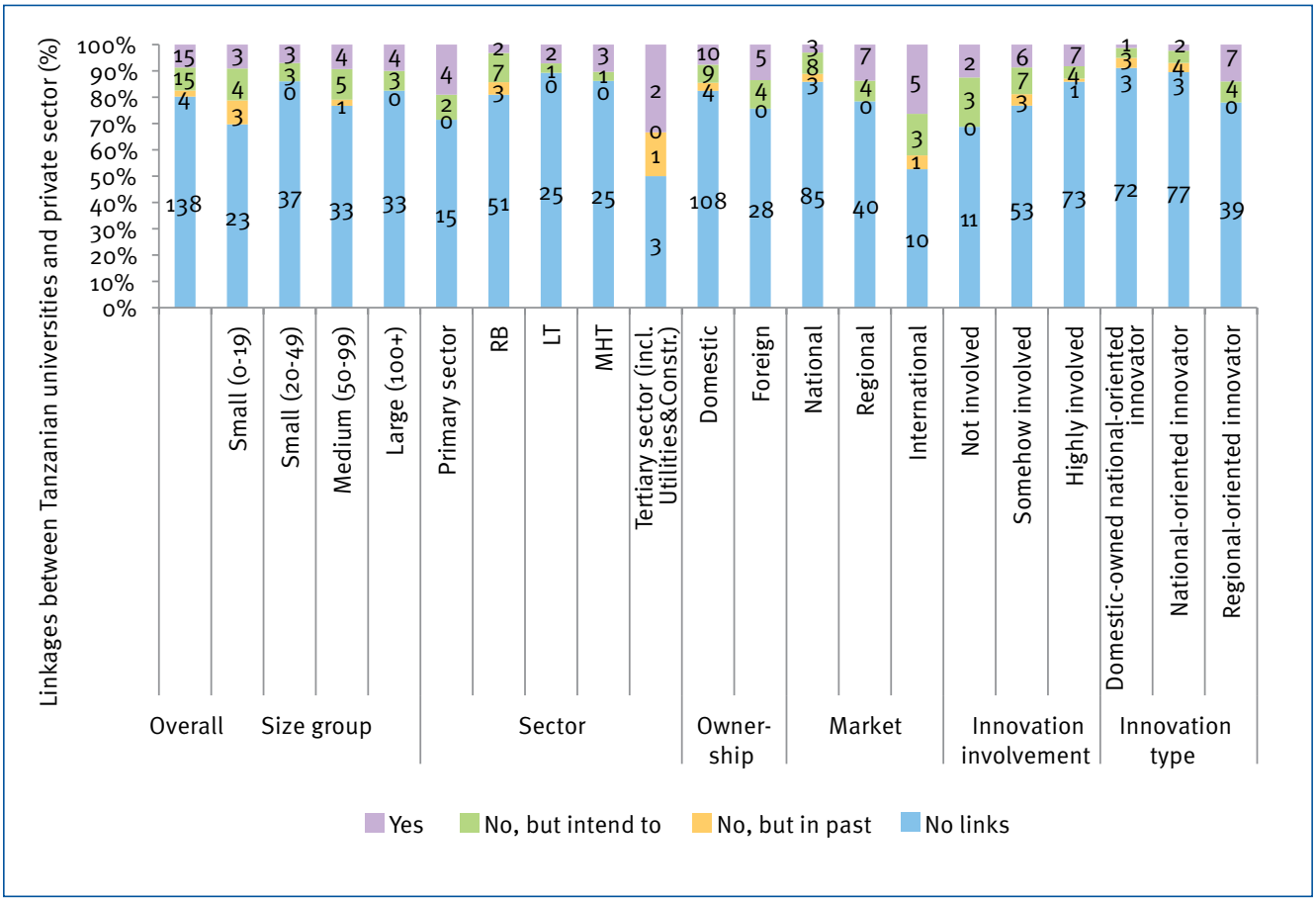
In this respect, our skills survey asked Tanzanian companies to report their perceived 'skills availability' in the country. The results show that skills availability depends primarily on the level of skills the company demands from new workers (Figure 33). Over 80 percent of the companies have no difficulty finding low-skilled workers. It is already much more difficult to find medium-skilled workers, and high-skilled workers seem to be a rarity: nine out of ten respondents claim that it is very difficult to find high-skilled workers.

Regarding the recruitment of graduates, three-quarters of the companies surveyed state that 'relevant work experience' followed by a 'positive attitude' are the most important factors. Interestingly, the candidate's academic background, degree or university attended are generally not considered as relevant. This suggests a general lack of confidence among companies in the quality of the education system and concern that graduates lack relevant practical experiences.

Skills formation: a missing link between education and firms

To address the skills mismatch problem Tanzanian companies and the economic system as whole currently faces, businesses that demand skills and the education system that supplies them need to coordinate their efforts. The more companies collaborate and establish partnerships with universities, the higher the possibilities of the latter to impart quality education, complement theoretical knowledge with practical experience-based skills and conduct relevant applied research (Lall, 2001; O'Sullivan, 2011; Noman et

Figure 34: Linkages with Tanzanian universities by firm type



Source: GoT & UNIDO Industrial Skills Survey 2011

Note: The numbers in the bars represent the frequency for each group

al., 2012). In this respect, a number of coordination problems can be identified in the Tanzanian context. The vast majority of companies claim that they have no links with Tanzanian universities. Only very few companies state that have established such links, while some claim that they have not yet linked up with universities, but will likely do so in the future (Figure 34).

There are two main reasons why business-university linkages are so weak. About one half of companies assert that they lack 'information about what universities offer', and one-third claim that they lack 'information about whom to contact at the university'. Overall, the results point to a serious coordination failure between universities and businesses, since the lack of information flows could be resolved with a relatively small amount of resources. In addition, the general lack of information flows and of collaboration between universities and businesses seems to have negatively affected companies' general attitude towards the tertiary education system. In fact, over two-thirds of respondents believe that they would not benefit from linkages with Tanzanian universities in any form.

The education system: tertiary education and vocational schools

Over the last decade, Tanzania has undertaken an unprecedented fiscal effort to support its education system, including the abolition of primary school fees and enrolment-related contributions (since 2004). In 2011, public spending on education amounted to nearly 20 percent of the government's total budget (of which half is spent on primary education), while education expenditure per capita increased by 175 percent from 2005 to 2011. On the other hand, secondary schools are relatively underfunded and are facing enormous pressure. In 2010, enrolment in secondary education (grades I-IV) was only 30 percent of Tanzania's total youth population and the student body of secondary schools is growing by more than 30 percent per year (World Bank, 2012a). As for tertiary education, the number of graduate students continues to be inadequate and enrolment rates are low in absolute terms (in 2009/10, the approximately

Box 13: The College of Engineering and Technology (CoET) at the University of Dar es Salaam

The College of Engineering and Technology (CoET) is a semi-autonomous campus college at the University of Dar es Salaam, established in 2001 through the integration of the Institute of Production Innovation and the Faculty of Engineering. CoET is currently home of six engineering departments in the main branches of engineering. For the academic year 2011/2012, one-third of the 1.396 undergraduates are enrolled in the Department of Chemical and Mining Engineering, another third in the Department of Mechanical and Industrial Engineering and one-third in the Department of Construction and Structural Engineering. In contrast, the smaller postgraduate community (396 students in total) is mainly (60.6 percent) concentrated in the Department of Mechanical and Industrial Engineering.

Overall, the CoET curricula underwent a three-year revision process from 2009 to 2012. The review process was initiated with the Tracer Study, followed by a stakeholder workshop. Involvement in the review process was voluntary and invited all internal stakeholders, including the university management, staff members, graduates and employers of graduates to participate (UNIDO, 2010). CoET is addressing the following key issues as a result of the revision process and the identification of its main weaknesses:

- **Increasing collaboration with private sectors and industries**. CoET's most important private partners include all potential employers of graduates in disciplines such as civil, mechanical, electrical, chemical and process, mining and textile engineering. However, CoET still faces difficulties in collaborating with private companies.
- **Strengthening the international research network.** Currently, CoET is involved in joint research projects on renewable energy, food and security, natural resource development, water and environment, in partnership with several international universities.
- **Involvement of students in research activities and acquisition of practical experience.** Undergraduate students participate in practical training in industry for 8 weeks in their first, second and third year. A large number of postgraduate students' research addresses industrial problems. In addition, companies offer special stage programmes, for example, the Structured Engineering Apprenticeship Programme (SEAP), which is available to graduates for 3 years following graduation.

Source: Interview with CoET

120.000 graduate students were distributed across 31 universities, 20 of which are private) as well as in relative terms, when we compare Tanzania to other countries such as Burundi, Kenya, Rwanda and Uganda (World Development Indicators, 2012).

To better understand to what extent students are aware of companies' skills requirements and how satisfied they are with Tanzania's tertiary education system, the Government of Tanzania and UNIDO conducted a curricula survey in 2011. On the whole, students expressed a medium-high degree of satisfaction with the programme they are enrolled in. The marks for study materials, physical infrastructure, didactic instruments and computers were particularly negative. In terms of the coverage of the subjects in the curricula, the majority of students state that their respective programme should include additional courses that are currently not available, including numeric methods, scientific writing and project management. Only half of the respondents state that they received some form of on-the-job training such as internships, participation in workshops and field trips; it must be noted that these students are highly satisfied with these activities. Box 13 provides a brief overview of one of the key colleges for technical education in Tanzania.

Formal education-based skills are necessary in order to use technologies effectively, for example, literacy skills allow workers to read blueprints, whereas engineering skills allow them to operate and control sophisticated machines. However, very often, basic skills acquired in primary and secondary schools, such as literacy and numeracy, or higher skills acquired at university turn out to be insufficient, as production processes require workers who also possess experience-based technical skills. Such skills are generally acquired through vocational training and colleges of technical education. The major providers in Tanzania of industrial skills that are relevant for industries are the VETA training centres and company-based training centres. Internal training schemes are mainly provided by larger and parastatal companies. However, such schemes drastically decreased when parastatals were privatized. In 2010, the total number of students enrolled in all forms of vocational and technical education was approximately 180.000 (URT, 2011: Chapter 19; ADEA, 2012).

Box 14: The Vocational Education and Training Authority (VETA)

VETA is the state body responsible for the management of vocational training in Tanzania. It is governed by a tripartite council comprising employer and employee representatives, including trade unions, and government representatives from the Ministry of Industry, the Ministry of Labour and the VETA secretariat. The implementation of policies developed by the council is overseen by the VETA secretariat at headquarters in Dar es Salaam and nine regional offices. VETA operates along four main operational axes (VETA, 2010):

- **Provision of training and vocational education** through its own network of education centres, including 25 VETA-run public training centres, and a total of some 900 institutes.

- **Revision and setting of VET curricula at the national level**. Currently, there are 50 subject areas clustered into 12 skills groups (e.g. mechanical, electrical and civil engineering; construction). For each group, a sector advisory committee reviews the group's curriculum. The sector advisory committee is a technical group which advises the governing board on the relevance and quality of the training programmes. The labour market department within the VETA secretariat also conducts market surveys to identify skills needs by employers. While there is an attempt to preempt future needs within industry, there is currently no strategic thrust to build skills in areas not currently within the countries industrial mix.

- **Continuous formation for VET teachers** for increasing quality of teaching within the Vocation Teachers Training College. The vocation teacher training college is tailored towards two streams: (i) courses on pedagogy, skills for teaching and communication for industry experts to prepare for the unfamiliar challenges of teaching; (ii) providing more experienced teachers with industry placements and exposure to either upgrade existing skills or become acquainted with changes in their industry of expertise.

- **Accreditation and assurance of quality and relevance** of other vocational training institutions and centres run by other actors such as the Ministry of Works, other ministries, private companies, civil society, faith-based organizations and private individuals. In an attempt to ensure a minimum standard in the quality of students graduating from vocational schools, a national standardized exam is held for each subject. Recently, trade exams have been scaled back to put greater emphasis on continuous assessment.

The strong commitment to quality assurance is testified by the fact that in 2011, the number of vocational training centres fell from 900 to 300 institutes as a result of the annual review of accreditation standards. Also, the supply of programmes has been segmented to increase training effectiveness, flexibility and differentiation: the minimum requirement in terms of formal education to offer VETA trainings has recently been increased for many programmes, especially those aimed at developing higher experience-based technical skills, while for other programmes, especially those targeting the informal sector, there is no barrier to entry.

The VETA planning, labour market and development programme is responsible for promoting private sector-industry interaction. Industry experts are involved in the training process as educators in some cases, but there appears to be a limited level of technology sharing. Memorandums of understanding are being prepared for several companies, with trainings geared specifically towards the projected needs in the short to medium term. Special industry-specific trainings have been introduced in Moshi and Mwanza for the mining sector. Internship placement is common practice in most education programmes in Tanzania, and is part of many technical programmes.

The main sources of financing include sales of products from training and other income generating activities; enrolment fees; public funds and companies. Overall, the lack of appropriate funding limits the possibilities of upgrading vocational training programmes, especially in those areas of training requiring high investments in capital equipment or those affected by fast technological change.

Source: Interview with VETA

7. Resource-based Industrialization

Tanzania is well endowed with natural resources, especially minerals, land, livestock and forestry –for the coastal regions and Zanzibar, marine resources are also highly relevant. Developing these resources through industries that use them as feedstock has and will continue to play an important role in Tanzania's path of industrialization. Moreover, resources continue to be discovered in Tanzania, such as the recent finding of offshore natural gas reserves. By strategically planning its development, Tanzania can capture emerging global opportunities and use its resources efficiently to transform into a significant player in resource-based industrial markets.

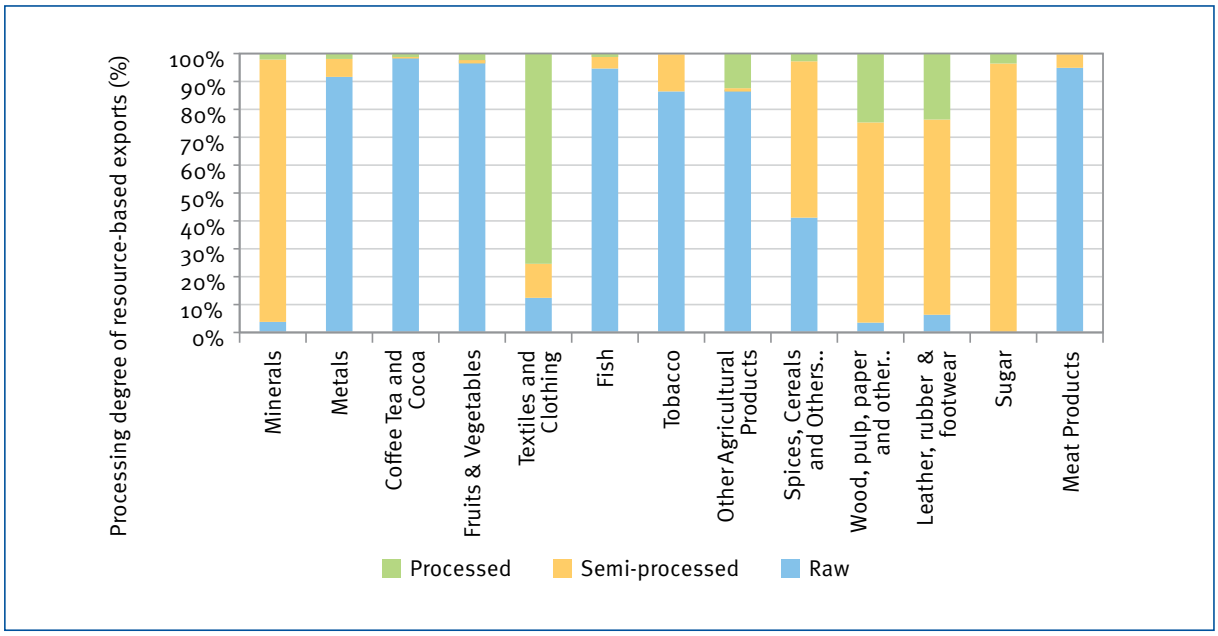
To facilitate this transformation, it is imperative to take stock of Tanzania's prospects and emulate the policies implemented by successful resource-based industrialized countries, while avoiding mistakes made by less successful counterparts. In this chapter, we briefly evaluate the contribution of resource-based industries to the Tanzanian economy in the past before analyzing the experiences of countries that have treaded the path of resource-based industrialization, evaluating Tanzania's prospects in major resource-based products, and identify ways to mitigate the challenges associated with this course of development.

The key message emerging from this chapter is that Tanzania's resources are not yet being used to their full potential to fuel industrialization. Furthermore, resource-based industrialization through strategic identification of product categories and supportive policies may offer some promising prospects for Tanzania's industrial development.

7.1 Where does Tanzania stand?

Based on our earlier analyses in Section B, we find that 11 of the 20 most dynamic products in the global markets over the last decade have been resource-based manufactures. The share of resource-based manufactures in total exports increased rapidly in the last decade, particularly for Tanzania. With an annual growth rate of 31 percent, exports increased from US$ 90 million to US$ 1.3 billion from 2000-2010. Metals and its variants dominate Tanzania's resource-based exports with a lion's share of 73 percent. Figure 35 presents the share of raw, semi-processed and processed products in Tanzania's total resource-based exports. Clearly, the majority of resource-based exports are currently raw or semi-processed products. Hence, even though Tanzania's resource-based products are huge foreign exchange earners, the linkages of these

Figure 35: Processing degree of resource-based exports, 2011



Source: UN Comtrade

Box 15: The gold sector's contribution to Tanzania's economy

The Tanzanian gold industry comprises foreign mining companies mainly originating from Canada, USA and South Africa. Tanzania is the third largest gold producer in Africa, with US$ 1.43 billion in export revenue in 2010. Yet with mining royalty rates ranging from 3-4 percent, the government's access to this export earning is extremely restricted. In addition, the linkages of this sector to the economy as a whole are limited as no gold beneficiation or refinery facilities currently exist in Tanzania. The extracted gold is directly exported to Japan, South Africa and Switzerland for further processing. Kweka (2009) reports that large mining companies are detached from local supply chains in Tanzania, that local purchases are limited to low critical and less complex inputs in terms of both goods and services, and are mostly limited to food and beverages. Unlike the case of the gold sector booms in South Africa and Australia, no significant backward linkages have been created in Tanzania. Machinery, spare parts and other equipment are directly imported from foreign companies in ready to use form through supply and service contracts. Hence, there is very little spillover effect in terms of technology or human capital development. Mjimba (2011) identifies the lack of specific targets with regard to local employment and local procurement requirements in mining agreements and strategies as the chief reason for the lack of domestic linkages in Tanzania's gold industry.

Table 15: Successful case studies of resource-based industrial development

Country	Chile	Botswana	Norway	Malaysia	Sweden/ Finland
Industry/ Products	Processed fruits, berries, fish & wine	Diamonds	Fish products, oil & natural gas	Rubber & palm oil	Processed forestry products
Main policy instruments used for facilitation	• Skill requirements met through university -industry collaboration. • Government undertook special efforts to identify these sectors, set quality standards and in overseas market promotion.	• Revenue from diamond sector used to promote other small/ medium scale industries. • Revenue Stabilization and public debt fund effectively utilized. • Domestic processing of diamonds encouraged through policy measures.	• Effective use of revenue from oil and natural gas to promote high-technology industrial and service clusters. • Continuously maintained its dominance in various fish product exports through application of better technology.	• Plugging gaps in value chain by development of a whole range of complimentary industries. • Effective use of export-import policies to promote industries.	• Promotion of forest products based on high-technology clusters, which provided a basis for expansion of other technology intensive manufacturing sectors. • Promoted industry-research institute linkages, generating cutting edge technology.
Lessons learned	Identify and promote resource-based high value added 'niche products'.	Targeted policies can enhance linkages of resource-based industries.	The challenges of 'resource curse' attached to oil/ gas boom can be minimized through effective policies.	Development of complementary industries to fill gap in value chain will enhance linkages.	Resource-based industrialization can even facilitate creation of unrelated high-technology manufacturing sectors.

industries to the economy are presently quite limited. The case study of gold exports from Tanzania discussed in the Box 15 emphasizes the limited linkages of this major resource-based sector in terms of employment, input demand and output processing. Further discussions in this chapter reveal that this only further depicts Tanzania's untapped potential in terms of resource-based industrialization.

7.2 Learning from global experiences

Industrialization based on the processing of natural resources was already advocated as a development strategy for many resource-rich countries in the 1950s: organizations such as UNIDO, UNCTAD and several others preached the efficacy of this strategy (Adams and Behrman, 1981). But the less satisfactory growth episodes of most Latin American and African countries, whose economies heavily depend on natural resources, encouraged the development of a school of thought which viewed resources as a curse to economic growth (Sachs and Warner, 1997). This coincided with a period of labour-intensive, manufacturing-driven growth in East and South Asia, inducing many to turn their attention towards this type of growth path and rejecting resource-based development. However, countries such as Chile, Botswana, Norway, Malaysia, Sweden and Finland demonstrate that resource-based development can be quite successful as well (Table 15).

In short, this analysis suggests that resource-based industrialization should not be viewed as a 'recipe for disaster'. With the early identification of strategic sectors, the development of necessary institutions and proactive policy interventions, resource-based industrialization can become a source of long-term productivity gains and economic development for resource-rich countries like Tanzania.

7.3 Prospects for resource-based industrialization

Tanzania has some promising prospects in resource-based industrialization, particularly due to the recent discovery of natural gas, nickel and uranium, and large scale plantation agriculture initiatives. A brief discussion of some of these promising sectors follows.

Natural gas-based industrialization

As mentioned in the introduction, natural gas production started recently in Tanzania (post-2000). The Tanzanian deep water offshore regions have already been divided for exploration between all major international hydrocarbon players. Currently, only two wells, located in Songo-Songo and in Mnazi Bay, produce natural gas in Tanzania. In early 2012, Statoil confirmed finding gas reserves in the amount of 5 trillion cubic feet, followed by the discovery of a 7 trillion cubic foot gas reserve by British Gas, putting Tanzania's official reserves at around 17 trillion cubic feet. These two discoveries alone will raise Tanzania's ranking in international natural gas proven reserves from 85th to 31st position (CIA rank list 2011). With more reserves expected to be found in the near future, Tanzania is poised to become a major player in the global gas industry.

In addition to power generation and use as fuel, natural gas can be used as feedstock of several downstream industries. Methanol, urea and ethanol production based on natural gas opens up a whole list of possible petro-chemical industries in addition to fertilizer plants (Racha, 1998). However, we must keep mind that huge investments in all these industries to enhance direct usage of natural gas in Tanzania might not be the optimal way forward. A careful selection of a few domestic industries to invest in and exporting the rest of the gas could be a viable attractive alternative. In fact, Jaccard et al. (2000) made similar recommendations to Bangladesh following a major gas discovery there.

Tanzania is currently planning to open of large fertilizer plant to capitalize on natural gas production. The plan is to develop Tanzania into a major fertilizer exporter in Africa. Despite the country's massive potential, a detailed cost-benefit analysis needs to be conducted to determine the most appropriate downstream natural gas-based industries for Tanzania. In addition, careful steps need to be taken in relation to natural gas pricing, the involvement of foreign and domestic players and the usage of revenue associated with the gas boom. It is highly unlikely that natural gas exploitation will contribute to a sustainable path of industrialization if these issues are not dealt with in a strategic manner as soon as possible.

The iron and steel industry

The construction of the Liganga iron ore and steel plant is currently underway, managed by a joint venture between the National Development Corporation (NDC) and Sichaun Hongda Group by formulation of the SPV known as Tanzania China International Mineral Resources Limited (TCIMRL). The Liganga iron

ore reserves are estimated at over 2 billion tonnes and its annual iron ore production is estimated at 3 million tonnes which translates into an annual steel production of 1.25 million tonnes at a yield value of US$ 450 million per annum (at a unit price of US$ 360 per tonne of steel iron).The iron ore at Liganga is contained in igneous rocks with traces of minerals such as nickel, cobalt, copper, platinum, vanadium, titanium and magnetite, which could be a major source of raw materials for other industries (NDC project update to POPC). Considering the lengthy life span of steel production (an estimated 667 years, given the production/reserve ratio), other downstream manufactured products based on locally produced steel and its by-products could drive Tanzanian industrialization in the future.

Agro-processing industries and high value agro-products

Tanzania's agriculture sector, mainly characterized by subsistence level farming, is at the dawn of a new era. The Southern Agriculture Growth Corridor of Tanzania (SAGCOT), large scale sugar cane and sisal plantations, encouraged and facilitated by government, are all initiatives off the beaten track. The Rufiji Basin Development Authority (RBDA) is currently identifying large tracts of fertile land and diverting them to specific large scale plantations such as sugar cane to provide feedstock to an expanded domestic sugar industry. These initiatives suggest that Tanzania could focus on agro-processing industries on a larger scale in the future, encouraging mutually beneficial partnerships between industry and agriculture.

Intra-sectoral linkages that can initiate a modernization of agriculture are one of the key benefits associated with an emerging manufacturing sector in low income countries. Instead of replacing the primary sector, industrialization can contribute to substantial productivity increases in agriculture. In line with this argument, Tanzania has little alternative but to adopt a value chain development approach to make its agricultural sector more profitable while simultaneously creating more jobs. The example of instant coffee production in Latin America in the 1970s provides an interesting example of such an approach. A new industry of export-based instant coffee was created within a short period of time as a result of strong government supported initiatives. The technology required for instant coffee production was acquired, factories for production incentivized and an input–supply chain established to create a complete value chain starting from coffee beans to readily marketable instant coffee. From the export of simple raw coffee beans in the late 1960s, these factories in producer states accounted for more than 50 percent of total global instant coffee production by 1990, creating a fully localized high value added production chain (Talbot, 1997).

Box 16: Case study on high value agro-exports from Chile

Chile represents a quintessential success story of resource-based industrialization, particularly in non-traditional resource-based manufactured products. While copper remains a leading export of Chile, it is the country's phenomenal entry into high value agricultural products (which can be termed manufactured goods due to the technological intensity involved in the production, processing and packaging), namely fish, wine, berries and fresh fruit. Guaipatín (2004) clearly underscores the relevance of the role of the state in Chile's success story in terms of investment in knowledge generation, infrastructure and favourable policies. For example, in salmon production, Chile went from no salmon production in the 1980s to becoming the second largest producer after Norway. The highly value added fresh and frozen salmon fillets represent a lion's share in exports. The development of the salmon industry in turn led to the development of other local manufacturing industries like the production of fish farming cages and nets, the construction of floating warehouses, the manufacture of feed, vaccines and antibiotics, transportation and infrastructure maintenance services. Consequently, the poverty rates in salmon producing regions dropped from over 40 percent in 1990 to 24 percent in 2000 (Montero, 2004). The state sponsored Fundación Chile (technological think tank) in collaboration with local universities contributed significantly to industry specific innovation. The Chilean government implemented strategic policies such as monitoring fishing concessions and identifying strategic salmon farming grounds, restricting salmon egg imports to promote local capability, closely monitoring sanitary standards, allocation of funds to R&D and overseas promotion activities. Tanzania is one of the largest exporters of fish fillets from Africa, and Chile's success story provides a number of lessons to be emulated not only for fish production, but also for several other high value technology intensive agricultural products.

In addition to generic agro-processed goods like sugar, Tanzania should identify some niche high-value products such as 'organic products' or 'free range farm products', which yield much higher export value and cater to high-end markets. One of the additional advantages of producing such niche goods is that they are less susceptible to global commodity price fluctuations. For instance, premium coffees earn considerably more than normal coffee and are almost completely insulated from normal coffee market price fluctuations (Kaplinsky, 2004). One such product, which Tanzania has already identified, is frozen fish fillets, with Tanzania having emerged as one of the largest exporters from Africa to EU and US markets. Tanzania exported frozen fish fillets amounting to US$ 71 million in 2010, over 90 percent of which was exported to high income markets which registered an average annual growth rate of over 17 percent in 2000-2010. Exports of Tanzanian fish fillets exports were considerably higher than Kenya's (US$ 22 million) and Uganda's (US$ 5 million), which also have access to the fish catchment area in Lake Victoria.

The Agricultural Growth Opportunities Act (AGOA), which gives preferential access of Tanzanian agricultural goods to EU and US markets, provides additional reasons to embark on value added agro-goods production. The case study in Box 16 discusses the highly successful example of Chile's agro-product industry.

Nickel, uranium and other minerals

Tanzania has recently unearthed large deposits of nickel, uranium and other minerals. The estimates of the levels of uranium found in the Namtumbo District alone have the capacity to make Tanzania one of the ten largest uranium producers and to become one of the top three exporters in the world. Most of these minerals can be extracted and directly exported to markets abroad, as in the case of gold. However, some of these minerals could be processed locally and more value addition created domestically before exporting them. Hence, there is a need to carefully identify such minerals and associated industries and to develop these. For instance, the main industrial usage of nickel is in alloying elements in ferrous alloys (stainless steels, low alloy steels, cast irons and some specialty steels) (Davies, 2000). This opens up possibilities of domestic usage once the Liganga steel plant commences production. Industrial deepening and upgrading from raw minerals towards high value added specialty manufactures could be a strategic opportunity for Tanzanian industry.

7.4 Challenges of resource-based industrialization

Despite huge potentials, the fact remains that many countries that were on the path of resource-based development in the past failed to achieve noteworthy growth results. Naturally, several challenges are associated with resource-based industrialization, which we briefly outline in this section. The key argument here is that most challenges can be overcome if appropriate precautions are taken well in advance.

High capital intensity

Most of the resource processing industries, such as the natural gas-based as well as the iron and steel industries, are predominantly capital intensive. The huge capital requirements to set up these industries necessitate finding large foreign investors as partners or owners. This brings up a well-known challenge: limited benefits for the domestic economy, as witnessed in the case of gold extraction. Racha (1998) analyses the case of the development of natural gas-based industries in Trinidad and Tobago, and finds that the typical gas-based industrial plant employs 3,000 people during the construction phase (one to three years), but only 75-100 people on a permanent basis. According to Ciccantell (1999), each job created in the Brazil Amazonian aluminium industry required an investment of around US$ 172,000 to US$ 22.4 million. Furthermore, the cost of establishing these downstream industries remains a major obstacle to the development of these industries due to the high capital intensity. For instance, the Mchuchuma-Liganga coal and steel project is expected to require an investment of over US$ 3 billion before the plant even starts operation.

Hence, the government has to identify new ways of raising the initial capital required to develop these capital intensive industries, mainly with the help of the private sector. This also calls for prudent investment decisions: investments must be made in selected industries which will provide maximum benefits to the economy. A comprehensive approach that spreads investments thinly across a large range of projects is unlikely to succeed, making strategic prioritization key to success.

The resource curse

The biggest challenge associated with resource-based industrial growth is perhaps the 'resource curse' – the phenomenon that countries dependent on resource-based industries tend to grow slower than other

Box 17: Resource curse

Causes or symptoms

- Dutch disease, in which the natural resource export boom affects the productivity of the tradable sector due to :
  - A relative increase in the price of non-traded goods
  - A real appreciation of the currency, making exports less competitive
  - A shift of labour and capital from the tradable non-resource industries to the non-tradable and natural resource industries
- A possible secular decline and high volatility of prices in international markets for natural resource-based commodities and associated impacts in the domestic economy, especially in terms of macroeconomic stability
- Less likelihood for the development of institutions that promote the decentralization of power or rule of law
- The 'voracity effect' (Tornell and Lane, 1999), i.e. the increased probability of armed conflicts over ownership and distribution of resource revenues.

Remedial policy instruments (adapted from Frankel, 2010)

- Risk-sharing contracts between foreign companies and governments to minimize the impacts of price volatility
- Denomination of debt in terms of commodity prices
- Binding rules of budget deficit (successfully utilized by the Chilean government)
- Commodity funds or sovereign wealth funds to save revenue from the current resource boom for future welfare
- Accumulation of reserves by Central Banks
- Lump-sum redistribution schemes (practiced in Alaska)
- Imposing external independent checks through international organizations
- Hedging export proceeds in global commodity futures market to minimize the impacts of price volatility.

countries. Sachs and Warner (2001) demonstrate that resource-rich developing countries grew at a lower rate, on average, than other developing countries. The reasons for the resource curse can be multiple, as explained in Box 17. In view of the recent natural gas discoveries which open up the possibility of huge tax revenues, Tanzania may be exposed to several features of the resource curse, if not to all of them. However, as we point out below, the detrimental effects of the 'resource curse' can be minimized or entirely eliminated with the help of proactive policies and the establishment of efficient fiscal and governance institutions. Tanzania must plan ahead for the possible occurrence of several of the symptoms related to the resource curse by carefully implementing specific policy measures targeted at each of them.

Infrastructure bottlenecks

The development of the resource-based industries will depend on the availability of infrastructure, such as low cost and reliable power supply and efficient port infrastructure. The lack of infrastructure facilities can jeopardize the profitability of large multi-million dollar investment projects. The government has to resolve these infrastructure bottlenecks as soon as possible to pave the way for resource-based industrialization. The first Five Year Development Plan (2011/12-2015/16) and USAID-GoT's 'Partnership for Growth' initiatives aim at removing the most pressing infrastructure constraints by 2016. Achieving these targets will be a prerequisite for the further development of resource-based industries in Tanzania.

Perkins and Robins (2011) propose an interesting idea to transform infrastructural challenges into an opportunity. Countries like Tanzania often face huge infrastructural deficits in terms of railway, roads and power which require investments well beyond the capability of a single investor (for instance, the government). Resource-based industries (such as mining) benefit tremendously from infrastructural improvements due to the major cost reductions and the expansion of the scope of operation. If the government can identify ways to collaborate with several large investors engaged in a region's resource-based industries, many infrastructural projects become more feasible due to the existence of important synergies. Hence, with strategic planning

and efficient negotiation, a cluster-based approach to the development of resource-based industries can perhaps help bridge the country's infrastructural gaps. For instance, Tanzania's Central Corridor (which is rich in minerals) extends to Rwanda and might represent an opportunity for clustered infrastructural development with the support of resource-based industrial investors. However, these modern linkages of the mineral sector are unlikely to emerge without substantial facilitation initiatives.

Limited linkages to the economy

Owing to its capital intensive nature and its heavy dependence on imported technology and inputs, resource extraction and processing industries might have limited direct linkages to the local economy compared with the expansion of labour-intensive manufacturing industries. Hence, special efforts must be undertaken to establish more linkages to the local economy by encouraging local inputs purchase and creation of more downstream industries that can provide value addition to the processed minerals. Auty (1988) analyses the resource-based industries in Saudi Arabia and concludes that the huge capital intensive industries demonstrate inefficient usage of capital, precisely because of the limited linkages. The revenue from these natural resource-based industries should be invested in other labour-intensive industries across the country to make economic growth more inclusive and to avoid imbalances in regional development. Owusu and Samatar (1997) describe how the revenues generated from Botswana's diamond industry were utilized to support the creation of predominantly small scale industries through the Financial Assistance Policy (FAP). This is a policy worth emulating in countries like Tanzania. However, an effective policy that can strengthen the backward, forward and financial linkages of the commodity sector involves several trade-offs and, above all, a clear strategy for negotiations with the extraction companies.

Technological and human skills deficiency

Maloney et al. (2002) argue that 'a deficient national innovative or learning capacity: that is, the human capital and the networks of institutions that facilitate the adoption and creation of new technologies' was the main reason why Latin American countries were less successful than Scandinavian countries in terms of their resource-based industrial development. These two factors, namely institutions for technological adoption and human capital, continue to remain a constraint in Tanzania. Owens and Wood (1997) find that primary goods processing is very similar to other forms of manufacturing in terms of the human capital and skill requirements, and that 'the chief determinant of whether a country with extensive natural resources can produce and export processed primary products depends on the skills of its workforce'.

The previous chapter of this report has already presented a detailed analysis of the current situation of industrial skills in Tanzania. Due to the serious lack of required skills, there is a need to plan well in advance and establish industry-specific training facilities that can cater to selected resource-based industries in Tanzania. For instance, in response to the growing needs of its domestic fruit industry, the University of Chile established a top rated faculty in fruit technology, encouraged modern fruit research and met the skill requirements of the industry at all levels. Similarly, the specific skill requirements of resource-based industries with a huge potential (e.g. natural gas and steel-based industries) need to be identified and training capabilities established as soon as possible. At the same time, prioritization of relevant skills is crucial and the respective employment creation potentials of individual sub-sectors need to be considered in this regard. While agro-processing will require a large number of low- and medium-skilled employees, the capital-intensive extractive sectors will require a smaller number of highly specialized technicians.

SECTION D: POLICY RECOMMENDATIONS

8. Policy Recommendations

Industrial policies are government measures aimed at improving the competitiveness and capabilities of domestic manufacturing firms and promoting structural transformation (UNIDO/UNCTAD, 2011). They support the generation of production and technological capacity in industries considered strategic for national development (Chang, 1994). The case for industrial policy remains strong and is in fact becoming stronger with technical change and globalization (Lall, 2003). However, the types of interventions needed are changing. As a structural force, globalization reduces the feasibility of some strategies while increasing that of others.

As a starting point for this section, it is useful to summarize a few key findings of the analysis conducted in section B of this report:

- Tanzania's MVA grew remarkably in the last decade, but this growth remains insufficient to close the gap to the next tier of comparator countries in terms of MVA per capita in the near future.

- Tanzania's manufactured exports grew rapidly during the last decade, driven chiefly by precious metal and other resource-based manufactures, but the absolute level of manufactured export capacity is still considerably lower than most of its comparator economies.

- In terms of industrialization intensity, Tanzania's MVA share of GDP remained constant at around 9 percent during the last decade, indicating that this sector is far from being a growth driver of the economy.

- With regard to structural change on the export side, the share of manufactured exports in total exports more than doubled, and Tanzania successfully caught up with Kenya while overtaking Rwanda and Zambia in this respect.

- In terms of sophistication of exports, measured by the share of medium-high technology manufactured exports, the increase was much smaller although the last decade witnessed progress in the right direction in terms of manufacturing deepening and sophistication.

- The Product Diversification Index showed Tanzania faring much worse than Kenya and South Africa, while with respect to market diversification, the performance is comparable to most benchmarks and even slightly better than that of Kenya.

- In terms of dynamic product exports, Tanzania performed extremely well, but again this success is mostly attributed to the huge demand for Tanzania's resource-based products.

The analysis of section C reveals that industrialization offers considerable prospects for the Tanzanian economy. Regional integration, increased access to global and domestic markets and the build-up of new resource-based manufacturing activities can all contribute to a sustained industrial growth path for URT. However, the point was also made that Tanzania will only benefit from these opportunities if a number of serious challenges are addressed – among them, the acute skill deficit in the industrial workforce.

Based on the above findings, this report makes policy recommendations that can be subsumed under the following nine broad thematic areas:

1. Prioritizing industrial policy
2. Consensus, ownership and leadership for industrial development
3. Bringing industrial development initiatives to the local level
4. Thinking of industrial policy both in the short and long term
5. Fostering industrial diversification
6. Regular industrial reports and data collection for industrial intelligence
7. Reviewing the regional integration agenda for industrial policy
8. Science, technology and innovation for industrial development
9. Skills development for industry.

While proposing these policy recommendations, we underline the fact that industrial policymaking is not exclusively the mandate of the government. As Rodrik (2004) contends,

> '*we need to worry about how we design a setting in which private and public actors come together to solve problems in the productive sphere, each side learning about the opportunities and constraints faced by the other, and not about whether the right tool for industrial policy is, say, directed credit or R&D subsidies or whether it is the steel industry that ought to be promoted or the software industry*'

This modern industrial policy process represents an overarching requirement that is crucial for dealing with each of the themes listed above. We deal with each of these policy areas in separate sub-sections in the remainder of this chapter, providing concrete policy recommendations.

8.1 Prioritizing industrial policy

With over 70 percent of the population employed in agriculture related activities, it is no surprise that the government adopted the '*kilimo kwanza*' as its core development agenda. Nevertheless, industrialization has recently received increased attention with the introduction of the FYDP-I, LTPP and IIDS. However, it has certainly not yet received the policy attention it deserves with a view to its potential of productive job creation and economic transformation. In the earlier sections of this report, we highlighted the significance of industrialization in triggering the structural transformation of the economy outlined in TDV 2025. At the same time, a priority status for industrialization does not mean neglecting agriculture or any other sector for that matter. A productive agriculture sector is in fact a basic requirement to fuel agro-based industrialization. At the same time, agro-based industries can increase demand for agricultural products and increase the profitability of agriculture. It is only through industry that subsistence agriculture can make room for competitive agro-business and increased domestic value addition. These complementary linkages between productive sectors need to be recognized.

One of the main constraints to active industrial policy in Tanzania is the lack of donor support. Donor support, which constitutes a major portion of the government's budget, comes with clauses for priority target interventions in social sectors and governance improvement, when industrial development could in fact have a much greater sustainable impact on equitable growth and poverty reduction. The former World Bank chief economist for Africa, John Page (2012) states this problem clearly in the context of African industrialization:

> '*the way in which the international community has chosen to define priorities for the reform of the investment climate may be hurting, rather than helping, Africa's prospects for industrialization. The donor reform agenda for the investment climate has centered on economy-wide reforms in trade, regulatory and labour market policies, designed to reduce the role of government in economic management. At the same time—shaped in part no doubt by the relentless pursuit of the Millennium Development Goals—donor attention to Africa's growing infrastructure and skills deficits has been weak at best.*'

In this vein, the international donor community needs to change its attitude towards industrialization and help the URT government in its efforts to prioritize industrial policy.

One essential requirement for prioritizing industrial policy is to ensure that all other related sectoral policies are supportive of industrialization. This includes, but is not limited to, policies in trade, infrastructure and macroeconomic management. This fact is exemplified by the case studies provided below on how different countries effectively used their diverse sectoral policies to support industrialization. In Tanzania, the Ministry

Box 18: Industrial policy in East Asia

No other region in the world has utilized industrial policy as effectively as East Asia to transform their economies. Though the fundamentals of the economies of East Asia differ quite significantly from those of countries like Tanzania, their policies and strategies can be adapted to the African context.

Lall (2003) argues elaborately that prioritizing industrial policy in East Asia played a key role in transforming the industrial sector to become the growth driver of these economies. The success of these industrial policies is reflected in the fact that East Asia as a whole accounted for 18.4 percent of world manufactured exports in 2000, up from 6.8 percent in 1981. There was no general 'East Asian model'. It is interesting to note that 'each country had a different model within a common context of export orientation, sound macro management and a good base of skills. Each model reflected different objectives and used different interventions (though some, like support for exporters, were similar). As a result, each had a different pattern of industrial and export growth, reliance on FDI, technological capability and enterprise structure. Governments in these Tigers showed the ability to devise and implement complex interventions effectively. In Korea and Taiwan, the two that used trade interventions, export-orientation imposed a strict discipline on both industry and governments. In Singapore, trade openness and the need to attract and retain FDI did the same.'

The extent of industrial policy prioritization is partly reflected by the power rested within their respective ministries responsible for the industrial sector. For instance, in Singapore, 'the management of industrial policy and FDI targeting has been centralized in the powerful Economic Development Board (EDB). EDB was endowed with the authority to coordinate all activities relating to industrial competitiveness and FDI, and given the resources to hire qualified and well-paid professional staff, which is an essential prerequisite to manage discretionary policy efficiently and honestly.' In Republic of Korea, 'There were monthly meetings between top government officials, chaired by the President himself, and leading exporters', signifying the importance given to the industrial sector in the national development agenda.

Source: Lall (2003)

of Industry is in charge of trade issues as well, which is indeed a good practice. But there is a need to ensure that the trade policies aid and abet industrialization efforts, as trade policies are often designed with the sole focus on agriculture. Trade policies can be efficient instruments to provide support for infant industries, to encourage exports by providing access to new markets and to build competitiveness over time. Shafaeddin (2010) states that '*trade policy is to be an ingredient of a comprehensive set of industrial and development policies and measures to enhance the capabilities of firms for establishing industries, making them efficient and upgrading them*'. Hence, trade policy negotiations should be foremost based on both short-term and long-term industrialization strategies.

In terms of macroeconomic policies to support industrialization, 'exchange rate protection', i.e. maintaining an undervalued real exchange rate to support export-oriented industrialization, has been proposed by Rodrik (2008). Rodrik's policy approach relies on the fact that empirically, high growth episodes in developing countries coincided with undervalued currencies and that the East Asian tigers were particularly successful in using this policy. Also, the infrastructure required to support industries must be clearly identified and a timely action plan developed to establish the required infrastructure capabilities. Such an action plan must also clearly define the ministry or agency that will be responsible for implementing each infrastructure project. The same applies to several other sectors like agriculture, land, banking and transportation services, where specific supportive policies for industrialization need to be identified and realized in a timely matter.

While pursuing industrial development, there is a need to ensure that the industrialization process is environmentally sustainable. Currently, the Department of Environment under the Vice President's Office and the National Environment Management Council (NEMC) are in charge of issuing guidelines to industries relating to environmental impacts. Though legislation exists in terms of audits, impact assessment and approvals, it is only enforced to a limited degree on the ground. At the same time, there have been increased complaints about the environmental impacts of the industrial sector, especially related to large-scale mines and the proximity of industries to residential areas. So with increased industrial development comes increased responsibility for the government to ensure environmental compatibility

and to minimize the negative impacts. At the same time, environmental control measures should not become excessively restrictive roadblocks to industrial development or give rise to new arenas for corruption and rent-seeking.

Accordingly, we propose the following policy recommendations:

- Industrialization should be made a national policy priority, considering its potential for employment generation and equitable growth. Industrialization will never be able to bring about the transformative structural change envisaged in TDV 2025, without a clear top priority status in the national policy framework.
- The donor community must be persuaded to acknowledge the importance of industrial policy and allow the government to give it the necessary priority in terms of increased budget allocation.
- Trade policy must be supportive of industrial policy by providing protection to certain industries while at the same time encouraging export-oriented industries to perform better.
- Other related sectoral policies (e.g. investment policy, FDI policy) should be revisited to exploit synergies with the industrial sector. In terms of macroeconomic policy, exchange rate interventions could be used strategically to facilitate industrialization.
- An action plan, carefully detailing the roles of different line ministries to facilitate industrialization, need to be formulated in a consultative fashion under the leadership of MIT and POPC.
- The environmental sustainability of the industrial development process needs to be ensured at all stages. The environmental regulations should be transparent and strictly enforced, with no loopholes for corruption or rent-seeking.

8.2 Consensus, ownership and leadership for industrial development

The institutional framework for the design and implementation of an industrial policy will predetermine its final impact. Although the MIT is the body responsible for industrial policy formulation in Tanzania, the decision-making process in reality is spread across different agencies and ministries (e.g. agro-industrial sectors are largely controlled by the Ministry of Agriculture). This naturally leads to a lack of cohesion between policies and impedes coordination with respect to sequencing and timing of policy

Box 19: Cut flower industry in Ethiopia: A success story in business-government coordination

The Ethiopian flower industry represents an extraordinary case of rapid and successful diversification into a non-traditional export product. The floriculture industry began to emerge in the late 1990s, and in less than a decade, and despite its late entry into the flower export industry, Ethiopia became the 5th largest non-EU exporter to the EU cut flower market and the 2nd largest (after Kenya) flower exporter from Africa in 2007. By the end of 2002, the government realized the opportunities the flower industry offered to earn sizeable amounts of foreign exchange. The Prime Minister's Office (PMO) requested the Ministry of Trade and Industry (MoTI) to propose a five-year action plan for the sector, outlining constraints and possible solutions. Based on the MoTI report, targets were set to put 1,000 hectares under flower production after five years, based on the record of Kenya's output and export earnings. At the end of 2002, the area under production was less than 30 hectares. To scale up from this base, the government provided multi-faceted support starting in 2003, focusing particularly on access to land, access to long-term credit, infrastructure and air transport coordination. Its strong commitment during this initial phase was demonstrated by the involvement of top officials, including the Prime Minister through his position as the chair of the National Export Promotion Committee, and frequent interaction with the sector's entrepreneurs directly and through their association. Monthly meetings involving representatives of flower producers took place with both the Minister of Industry and the Prime Minister present. Firms were encouraged to identify barriers to their growth and action points were agreed. The relevant government agencies took prompt and effective action to address the constraints, and progress was monitored in subsequent meetings.

Source: Gebreeyesus, M. and M. Iizuka (2010) & Page (2012)

actions, which determine the success of strategic industrial policies.

Political leadership at the top is a crucial factor for raising the profile of industrial policies and to ensure the required coordination, oversight and monitoring process (Rodrik, 2004). Inter-ministerial competition and policy incoherence can only be prevented by strategic leadership at the highest levels. It is also essential for high-ranking government officials to be responsible for industrial policy so they can be held accountable when these policies do not succeed.

As a point in case, the President of the Republic of Korea himself took the lead role in championing the country's industrial policies and strategies. Such an ownership of industrial policy at the highest political level is imperative for industrial policies to induce economic transformation. Also, the collaboration of top leadership with the private sector and the business community is crucial for ensuring the success of industrial sectors. The case study of the Ethiopian-cut flower export industry discussed in Box 19 presents an African success story of how cooperation between the highest political leadership and the business community led to the success of an unconventional industry.

For administrative and management convenience, it might be justifiable to make different agencies responsible for different sectors or functions[9]. But it is equally important to have an overarching institution with a clear mandate to provide policy coordination and to carefully define a strategic national industrial development agenda. Such a clear mandate is unfortunately missing for MIT. A full-fledged industrial policy coordination mandate will also improve transparency and accountability in policymaking, as one single institution will be able to stand up for the industrial policy of the country and can be held accountable for policy measures.

Furthermore, it is important to increase coordination between different government policies in order to give more strategic direction to industrial policy interventions. At present, policies are developed on a project-by-project basis, while a more strategic intervention would involve policy actions across sectors that are carefully sequenced. For example, to provide support to a labour-intensive sector like the garment industry, a mix of interventions involving tax breaks, higher import tariffs for garments, subsidized input access, liberal labour laws and export subsidies would create substantially more impact than any one of these interventions alone.

Resource and budget constraints also impair the ability of existing institutions to conduct effective industrial policy interventions. According to a survey carried out by REPOA[10], more than 50 percent of the MSE support institutions in Dar es Salaam stated that their budgets were insufficient to operate programmes at desired levels and 40 percent of institutions reported human resource constraints. A lack of budget and resources is also one of the factors explaining the limited outreach of MIT to regional and local government institutions.
Based on the above situational analysis, we propose industrial development to become a top priority of the Government of Tanzania, and recommend that:

- MIT should be given the clear mandate to coordinate industrial policy actions across different ministries and agencies.
- Industrial policy interventions should be more strategic by aligning policy actions across all linked sectors and by carefully sequencing the same to create maximum impact.
- POPC, as the government's think tank, should evaluate the strategic focus of different policy interventions and advise the government on ways to improve the impact of industrial policies.
- Industrial policies need to be championed at the highest political level. Regular meetings should take place between top political leaders and the industrial sector to identify the key constraints and to mitigate these through targeted policy interventions.
- More resources (both national and donor funds) should be allocated to existing institutions involved in industrial policy formulation to enable them to engage in meaningful policy interventions.

9 One example is SIDO's responsibility for SMEs and EPZA's role for EPZs.

10 Reported in Mnenwa & Maliti 2009

8.3 Bringing industrial development initiatives to the local level

Based on the analysis of resource-based industrialization in Section C, it is clear that Tanzanian resource-based manufacturing is still far from exploiting its full potential. Poor integration of central level government plans in local/ district level governments is a major contributing factor. Local government provides a structural arrangement through which locals and communities can participate in the fight against poverty at close range (Kauzya, 2002). Unfortunately, the central government does not sufficiently use opportunities to collaborate with local government to design initiatives for industrial development. This is especially true in the mining sector, where local governments complain that contracts for mines are awarded by the central government level without any prior consultation, leading to misunderstandings between the local and central government. Integration of central and local plans can in fact empower locals and prepare them to be able to maximize the local linkages of industries. Also, it has been found that the local and regional governments have an important role to play in supporting SME development (Humphrey and Schmitz, 1996).

SIDO's 'One District One Product' (ODOP) scheme is an example of an initiative that involved all local government bodies in identifying and promoting one agro-based industrial product for their respective district. However, such efforts of central-local government collaboration are, at best, limited in the Tanzanian industrial development policy framework at large, and particularly in resource-based industrialization. Accordingly, there is a need to increase the role of local and regional governments in the industrial policy formulation process. The case study in Box 20 on the role of local governments in industrialization lends some examples worth emulating in Tanzania.

The main reason for the lack of participation of regional and local governments in industrial development programmes is the lack of incentives. Most of the taxes and royalties are collected at the central level, with local governments getting a minute fraction thereof. Hence, most of the central level plans are ignored by local governments on an operational level. The Ministry of Industry and Trade lacks the necessary outreach to the regional level to send messages and absorb local needs and challenges. For the industrial development plans to work, the central government should ensure that local level government is aware of what needs to be done to facilitate industrial development in the regions, e.g. industrial land, infrastructure projects, skill requirements, etc., with a view to stimulating industry.

Box 20: Local government participation in industrialization: Case studies

Lin and Yao (2001) describe rapid rural industrialization centred at the development of numerous small-scale rural enterprises in China. In 1978, only 9.5 percent of the rural labour force was engaged in industrial activities, but this share had risen to 29.8 percent by 1996, mainly due to the labour intensive nature of these rural industries. According to Zhao (1997), the close involvement of local government helped these rural industries in terms of (i) preferential tax treatment (ii) easy and low interest bank loans (iii) access to land (iv) access to materials, and (v) consumer trusts.

Humphrey and Schmitz (1996) emphasize the important role played by local and regional governments in providing a framework in which clusters of SMEs could flourish in Europe, including, but not limited to (i) institution building (ii) promotion of consortia of firms (networking), and (iii) development of collective service centres. The paper recommends a triple C approach to local industrialization – Clustered (Collective), Customer-oriented (by trade fairs, regular information collection and other means) and Cumulative (in terms of performance and competiveness).

However, the abovementioned European experience may present fundamental difficulties in terms of comparison with Tanzania. It should be noted that this European model of local industrial cluster development with active local government support was successfully adapted in several developing countries, for instance, in the cotton knitwear industry in Tirupur, India, the footwear cluster in Agra, India, sports goods cluster in Sialkot, Pakistan and in the Republic of Korea's textile cluster in Daegu. Hence, this is an approach that could possibly be further explored in Tanzania.

Source: Lin & Yao (2001)

In addition, integrating local government at all levels of beneficiation of a country's resource endowments will help to increase the linkages of these resources to the local economy in terms of incorporation of community needs like employment creation, markets, solicited corporate social responsibility projects and skills development. This will make a significant positive contribution to inclusive growth and poverty reduction as well as build a healthy relationship between investors and local communities.

The lack of planning capabilities also limits local governments from effectively responding to the national level industrial development agenda through local level interventions. Hence, there is a need for capacity development and enhancement of planning skills at MDAs/LGAs. The Prime Minister's Office Regional Administration and Local Government (PMORALG) is the body responsible for local government authorities. That is, it is the most appropriate institution for promoting local participation in industrial policy planning. Therefore, the Ministry of Industry and Trade should develop a common understanding with PMORALG to ensure participation of regional and local governments in the industrial development path. An effective monitoring of progress in industrial development on the local level is one of the concrete areas for this cooperation.

Against this background, this report makes the following policy recommendations to facilitate greater integration of central and local industrial development plans and initiatives:

- Awareness creation: making local government at the regional, district and village level aware of what needs to be done to facilitate industrial development in their area/region (including industrial land, infrastructure projects, etc.) with a view to stimulating industry.

- A policy review with a view to creating incentives for industrial promotion at regional, district and village levels. This could be achieved through higher revenue collection at local level as well as through greater 'local purchase' and 'local employment and training' clauses in industrial development agreements.

- Capacity building and enhancement of planning skills at MDAs/LGAs. These capacity development initiatives can be used to promote the outreach of MIT to local governments.

- Clearly defining and emphasizing the role of local and regional governments in the industrial policymaking framework, especially in the case of MSMEs. As the case studies above depict, local governments can in fact contribute significantly in facilitating rural and local level industrialization.

- Putting in place local participation and empowerment requirements for all extractive industry development projects.

- Developing a common understanding between MIT and PMORALG to enhance local and regional government participation in industrial development planning as well as incorporation of the national industrial development agenda in local level plans.

8.4 Thinking of industrial policy both in the short and long term

As emphasized in previous sections, the development of the industrial sector, especially manufacturing, is a key driver of productivity growth and employment generation, significantly improving living standards. The major advantage of manufacturing relative to other sectors is the strong linkage and spill-over effect it has in the entire economy.[11] Therefore, the development of the manufacturing sector deserves to be one of the top priorities of any government. Unfortunately for Tanzania, the sector has not yet been given the priority it warrants, and consequently has remained insignificant in terms of its contribution to GDP. So far, the sector has mainly received ad-hoc support rather than a concrete industrial development strategy with adequate financial commitment. This is despite the fact that in blue print, the Sustainable Industrial Development Policy (SIDP) mentions such a strategic approach to industrial development, identifying areas for short-, medium- and long-term interventions. Two factors that are clearly missing are an implementation roadmap that clearly indicates the time horizon of interventions and a monitoring and evaluation plan which sheds light on which measures worked and which ones did not.

Given the fact that Tanzania is at a relatively early stage of economic and industrial development, it will have to undergo a wide-ranging structural change process.

11 For example, it is well known that manufacturing is a critical source of demand for other sectors. In particular, manufacturing firms are important consumers of banking, transport, insurance, communication and other high-value modern services.

The socio-economic transformation of Tanzania will not take place overnight. Equally, the emergence of a competitive manufacturing sector involves several phases[12]:

1. The first phase involves a gradual shift from the current niche status of manufacturing towards increased value addition in agro-processing, accompanied by a rapid expansion of a few existing low-technology, labor intensive activities. A development of these industries is immediately viable because they are largely in line with the country's current endowments, capabilities and framework conditions. A clear prioritization of concrete activities with the highest relative attractiveness is crucial for this.

2. In the second phase, manufacturing could be clustered around mineral extraction projects which already exist or are currently in the start-up phase. If the recent large investments in the mining sector can be combined with mineral processing activities (forward linkages), the sector will have substantial multiplier effects in the national economy. A facilitation of backward linkages with domestic manufacturers that can produce inputs into the commodity sector (e.g. tools/equipment, components, chemicals, food) is an equally important issue. The key challenge in this phase is to ensure the transition from pure extraction activities towards serious value addition and linkage creation.[13]

3. A third phase could eventually witness the emergence of a more diversified and more sophisticated internationally competitive manufacturing sector. While it is unlikely that Tanzania will move into substantial medium- and high-technology activities in the short term, looking ahead is important. Tanzanian manufacturers currently do not have the required advanced technological capabilities and human skills at their disposal and, hence, do not yet have a comparative advantage in these sectors. However, the country cannot afford to disregard the future potentials these industries offer. Instead, a selection of the most promising industries as long-term targets and deliberate investment into developing the missing technological capabilities and industrial skills is warranted well in advance.

12 Compare UNIDO/UNCTAD 2011 (Chapter 3) for a more detailed description of the step-wise design process of an industrialization strategy.

13 See UNIDO 2012 for a detailed analysis of the experiences of African resource intensive economies in promoting industrial diversification.

If the government wants to facilitate this step-wise industrialization path, the identification of quick wins as well as the definition of long-term targets is indispensable.

Agro-based industrialization is already a top government priority for the manufacturing sector[14]. This notwithstanding, there is no clear and comprehensive strategy based on this commitment. Some rural non-farming activities, especially in food processing (e.g. the edible oil sector[15]) have already emerged but still face a number of serious constraints that need to be removed. POPC is currently cooperating with the World Bank to apply the Growth Identification & Facilitation (GIF) framework in Tanzania. The results will include a list of currently unexploited (latent) comparative advantages in manufacturing sectors which are highly relevant for short-term identification of quick wins.

Building investment capabilities around resource-based industries still requires substantial efforts. With the help of foreign direct investors (FDI), Tanzania has made substantial investments in the mining sector, but with no or very little value addition and linkages. Recent investments, particularly in gold mining and exploration, have led to a rapid expansion of the mining sector. Since processing of minerals is both capital and skill intensive, the most appropriate starting point could be FDI. While there is no need to increase incentives to attract FDI in the primary activities of the mining sector, incentives to attract FDI in mineral processing should be considered. Another top priority for long-term investment in resource-based industrialization is the natural gas sector, which has been extensively discussed in this report. While the government has already prioritized the sector, a comprehensive strategy for investment is still needed.

With regard to defining concrete long-term targets for the creation of a modern manufacturing sector, little has been done so far. The prioritization of long-term focus sectors reflects a number of different objectives. The expected market success and growth potential of certain product categories is certainly a key dimension to consider. However, the strategic selection should also balance economic with social and environmental targets. The evaluation should hence include a pro-poor dimension, factoring in the employment generation potential as well as growth inclusiveness aspects of the respective sub-sectors. In this respect it is worth noting that labour intensive manufacturing usually goes hand in hand with a more equal growth

14 See, for instance, the first Five Year Development Plan (2011/12-2015/16), p. 49.

15 Compare: Musambya (2001).

path than mineral resource-based manufacturing. The ecological impact of individual industries as a third dimension also has to be considered. A comparison of the expected energy efficiency, material efficiency and resource depletion effects of an engagement in certain sectors can be a starting point in this respect. This evaluation will eventually imply a trade-off of economic, social and environmental objectives.

In light of the above, a number of policy recommendations can be summarized:

- In the short-term, industrial development can be based on an expansion of the most promising low-technology manufacturing activities and a shift from subsistence agriculture towards agro-processing. For an effective, focused promotion initiative, a few concrete short-term priorities on the sub-sector/ product level need to be identified on the basis of solid evidence.

- A shift from the current focus on supporting agriculture towards the active promotion of agro-based value addition is indispensable to generate quick wins.

- For a successful mid-term integration of the mining sector into the country's industrialization agenda, concrete potential forward and backward linkages have to be identified.

- A strategically targeted FDI attraction strategy is warranted. Investment incentive schemes have to be revised to focus on mineral processing as well as manufacturing activities that provide inputs into the commodity sector.

- The continuing success of Tanzania's path to industrialization will benefit from a clear definition of long-term industrialization priorities. The selection of these priorities has to be evidence-based and should consider the economic, social and environmental implications.

- The achievement of long-term objectives, including the shift towards more sophisticated, technology-intensive manufacturing activities requires substantial facilitating initiatives that have to commence well in advance. Investments will be necessary to upgrade the national technological capabilities and the development of advanced industrial skills in the workforce.

8.5 Fostering industrial diversification

Despite its impressive growth path, Tanzania's emerging manufacturing sector is still highly vulnerable. In particular, this report has identified product diversification as an area where Tanzania significantly lags behind Kenya and, hence, is a lot more susceptible to external shocks.

The seminal work of Hausmann et al. (2006) theoretically and empirically demonstrated that 'what you export matters' to determine the future growth trajectories of countries and 'how specializing in certain products brings more growth than specializing in others'. Many countries in East Asia and Latin America successfully employed industrial policies that incentivized investments in 'more productive goods' and achieved better economic performance. In addition, UNIDO (2009) found that between 1975 and 2005, the fast growing low and middle income countries diversified their production structures while their slow growing counterparts were less successful in their diversification and sophistication efforts. This again points to the link between growth and industrial diversification. Hence, Tanzanian industrial policy should aim at achieving a more diverse and sophisticated mix of its industrial products, both in the short and long run.

Industrial diversification involves both intra-industry and inter-industry shifts. The former entails upgrading and deepening of production within the same sub-sector (e.g. higher value addition and larger variety in the same product category), which can be achieved in the short term. The latter is characterized by a reallocation of resources from labour-intensive industries to advanced industries (e.g. from textiles to machinery), which is in line with the long-term transformation of the Tanzanian industry. Both these transitions are central aspects of Tanzania's product diversification process. In addition, diversification in terms of export destinations is important to cushion domestic industries from changes in third-country demand.

Short-term intra-industry diversification is the key strategy to facilitate growth in agro-processing (e.g. fruits, spices, etc.) and low-technology sectors (e.g. textiles). Hence, the government's policies should develop incentives and remove binding constraints for entrepreneurs to facilitate this intra-sectoral shift.

Box 21: Mali's mango industry

In the 'resource based industrialization' section of this report, we described the importance for countries to diversify into products of 'higher value addition'. The mango industry in Mali is one successful example for such a diversification strategy.

In the 1990s, Mali's economy was heavily dependent on cotton, gold and livestock as sources of foreign exchange, hence, the government decided to implement a strategy to diversify its export base. The mango industry was identified as the ideal candidate. Being a landlocked country, Mali faced significant constraints in accessing the lucrative European markets. Mali implemented a multi-modal (road, rail and sea) transportation reform in collaboration with the private sector and donor financing. In addition, a cold chain system was developed, phytosanitary improvements were made, certification and traceability programmes were implemented, coupled with training programmes in orchard management and post-harvest facilities. As a result, the export of mangos to Europe increased five-fold between 2003 and 2008, while the transportation time to Europe decreased from 25 to 12 days over the same period. The next stage of the diversification strategy, which is the establishment of processing facilities for mango pulp, juice and other products, is currently underway. A recent technical and financial analysis of the feasibility of mango pulp and nectar processing (conducted by a USAID consultancy), showed great prospects for diversification in Mali.

Source : Chuhan-Pole (2010) and Keturakis (2009)

Inter-industry diversification will be the key strategy for building a modern and sustainable manufacturing sector in Tanzania in the future. Building on its natural resources, the emergence of a large scale fertilizer industry and other natural gas-based chemicals industries is a likely starting point. In addition, with the increase in labour costs in China and other Asian manufacturing hubs, many sun-set industries could be profitably shifted to countries that offer labour cost advantages, like Tanzania.

To trigger industrial diversification, industrial policy needs to be targeted and selective subsidies for the 'costs of self-discovery' (Rodrik, 2004) considered. The provision of subsidies to first movers into new sectors, combined with clear performance benchmarks and phase-out clauses, can play an important role. For this to be possible, there is a need to identify and target industries and product lines that Tanzania could diversify into in the near future. International market dynamics, competitive pressures, existing technological and human capabilities as well as natural endowments are a few factors that have to be considered in this regard. However, most importantly, such identification needs to be conducted in close collaboration with the private sector in order to benefit from their market insights and investment considerations.

With regard to industrial diversification, the following policy recommendations can be summarized:

- Industrial diversification can considerably reduce the vulnerability of Tanzanian industry, making it a key strategic component of the country's industrial policy.
- A clear definition of suitable target sectors and product ranges for intra-industry diversification is necessary to encourage entrepreneurs to take the respective investment decisions.
- For longer-term, inter-industry diversification, the number of sub-sectors has to be strictly limited and concrete strategies to build the required competences need to be put in place.
- The government needs to initiate a serious evidence-based dialogue with the private sector to identify viable target sectors based on business intelligence.
- Promoting "self-discovery" and first movers into new sectors can be considered, but the enforcement of performance benchmarks and sunset clauses is indispensable.

8.6 Regular industrial reports and data collection for industrial intelligence

Policy relevant statistics are an important part of the development of any sector. Regular monitoring of performance and progress using indicators and benchmarks is therefore an essential part of evidence-based industrial policymaking. However, despite recent cooperation between MIT, NBS and UNIDO, a comprehensive database of industrial statistics is not yet available in the country. The current Tanzania Industrial Competitiveness Report (TICR) is meant to be an eye opener on the status and position of the Tanzanian industry compared to selected countries. However, if such analysis is not regularly repeated in the future, this report will be of very little use. It is therefore recommended for the Tanzanian government to take the necessary steps to ensure that data collection and the generation of key industrial statistics and indicators is conducted on a regular basis.

In addition to macro-level indicators that are useful for benchmarking and broad policy directions, there is also a need to look at the regional and firm level. While the macro-level indicators are useful for determining that something might be wrong in the system, it is the regional and firm level diagnosis that will enable action. Regional-level analysis will enable the identification of industrial growth poles, sub-sectoral divisions of labour in the country as well as geographical imbalances in industrial employment creation and value addition. Firm-level data provides critical information for the design of appropriate competitiveness measures that complement traditional macro-analysis[16].

Another area that requires reliable, timely and detailed statistics is industrial market intelligence. Market demand is a key driving force for the emergence of a competitive manufacturing sector in any country. A sustainable industrial growth path can only be initiated if the produced goods are in line with customers' interests and requirements. Market intelligence can inform investment decisions (both national and international) and thus facilitate the creation of new industries in the country. The current report indicates that Tanzanian industry has ample opportunities both in local, regional and global markets. The problem, however, lies in the limited access by industrial firms to information on markets. Since information typically can be copied at minimal cost, especially in a digitized world, the creation and dissemination of information tends to be subject to strong economies of scale, which means information can be produced by a single actor for all firms at a small price. For Tanzania, this function could be carried out by the Confederation of the Tanzanian Industries (CTI). However, the government can complement the efforts of CTI to carry out market intelligence for industry, especially for SMEs.

The set-up of an industrial observatory, discussed in the Box 22, provides a good example of how the government can take efficient measures to ensure availability and usage of industrial statistics, both for policy formulation and market intelligence. In addition to data generation and dissemination by the national government, the regional and local government institutions have a crucial role to play in terms of meaningful industrial data collection and analysis. Also, it should be noted that in both Uganda and in Rwanda, 'industrial data collection and analysis' has been recognized as an important component in their respective National Industrial Policy documents, but the same is absent in the Tanzanian SIDP.

The policy recommendations relating to data generation for industrial intelligence can be summarized as follows:

- The need for industrial data collection and analysis should be considered in the national industrial strategy and policy initiatives.
- Regular assessments of the industrial sector's performance need to be conducted to keep track of changes over time.
- A system to collect and manage regional and firm level data in a standardized format needs to be enforced.
- The creation of an industrial observatory to generate regular industrial intelligence should be considered. It is essential for the observatory to be well integrated in the national industrial policy formulation framework.
- Responsibilities need to be assigned to regional and local governments to collect data pertaining to industries in their respective regions, for instance, by conducting regular industrial surveys.
- Business membership organizations like CTI should be enabled to efficiently collect and disseminate

16 Compare the arguments in Altomonte at al. (2011)

Box 22: Industrial observatory for evidence-based policy formulation

Closing the institutional capacity gap that exists in developing countries in pursuing regular collection of industrial data and industrial intelligence generation, UNIDO initiated the 'Strategic Industrial Intelligence and Governance' programme. One of the main deliverables of the programme is the establishment of an Industrial Observatory that comprises trained local staff with well-equipped e-tools for industrial policy analysis. UNIDO's first programme was launched in Ecuador in 2004, where a specialized technical unit (UTEPI) was established at the Ministry of Industry, Trade, Competitiveness and Fisheries (MICIP) following several seminars and trainings. Together with the counterpart, UNIDO defined the terms of reference, deliverables and required human resources. In 2006, the unit was formally integrated into the structures of the Ministry through a decree to become the Department of Statistics and Industrial Studies. It was assigned to establish the observatory. It was requested to contribute to the elaboration of Ecuador's Industrial Policy 2008-2012 and to produce a roadmap for its implementation. The department has become the Ministry's think tank and produces biannual industrial competitiveness reports, value chain analyses, sectoral briefs, policy notes and offers online access to industrial information and data through the observatory. It is fully self-sufficient and autonomous. Similar units were successfully established in Paraguay and Colombia. Recently, there have been similar initiatives in Rwanda, The Gambia and Cape Verde. But, as we saw in the case of Ecuador, the extent of success of an industrial observatory/competitiveness unit crucially depends on how well the unit is integrated into the national industrial policy formulation framework at later stages.

Source: www.UNIDO.org

reliable and timely quantitative market data pertaining to all relevant industrial sectors.

8.7 Reviewing the Regional Integration Agenda for Industrial Policy

In the section of this report titled 'regional integration and industrialization', we analysed the manufactured trade performance of Tanzania vis-à-vis its regional counterparts in the EAC and SADC as well as the implications thereof. The key messages derived from our analysis is that Tanzania has improved its trade position tremendously over the last decade, while it still significantly trails behind Kenya in terms of regional industrial trade performance.

Regional integration, with a focus on trade liberalization, certainly has implications for industrialization and domestic industrial policies. In some cases, regional trade agreements have the potential to become more restrictive than WTO rules in terms of the possible range of industrial policies countries have traditionally implemented to generate new productive capacities (Shadlen, 2006). Hence, Tanzania needs to be cautious about which industrial policy measures it needs to give up in exchange for participating in regional trade blocks and to what extent it can use these regional institutions to further its industrialization agenda.

Twenty-six Southern and East African countries are involved in a nexus of RECs that mainly involve SADC, COMESA and EAC, with overlapping memberships causing constant policy dilemmas. Tanzania is a member of SADC and EAC and an active trade partner of COMESA. An agreement was made by the tripartite heads of state in the 2008 summit that "The three RECs should immediately start working towards a merger into a single REC with the objective of fast tracking the attainment of the African Economic Community"[17]. This has several implications for Tanzania in terms of increased future market access, increased competition and limited latitude in terms of protecting certain product lines and, hence, the extent of strategic industrial policy interventions.

In reality, regional integration efforts offer more than just market access for the industrial sector. Considerable 'economies of scale' can be explored in terms of facilitating efforts for industrialization and removal of constraints. The EAC Industrialization Strategy and Policy document is a right step towards picking a number of low hanging fruits. The EAC industrialization strategy aims at transforming its member states to achieve 'industrialized economy' status by 2032, but the crucial issue remains the lack of congruence between the EAC industrialization agenda and the national plans. Hence, Tanzania must support efforts aimed at implementing the EAC industrialization strategy and to simultaneously complement these

17 Source: http://www.comesa-eac-sadc-tripartite.org/about/institutional_framework

regional efforts with national policies and projects. The very limited collaboration between the Ministry of EAC and the Ministry of Industry on the synchronization of regional and national industrial policies needs to be intensified.

A closely related controversial issue is the Economic Partnership Agreement (EPA) between the EAC and the EU. Although the EPAs were created with development objectives, it has entered contentious terrain, especially on issues relating to the extent of market access, most-favoured nation clauses, export tax, treatment of infant industry, stand still clauses and quantitative restrictions (Bilal and Ramdoo, 2010). Hangi (2009) expresses concern that the EPA with the EU has the potential to suppress industrial development in the EAC and limit it to a cheap source of input and primary commodities for the EU. Tanzania has to be cautious while negotiating trade clauses with the EU as these have strong implications on the future flexibility of industrial policy instruments.

Another area where the EAC and SADC secretariats can make meaningful contributions is the regular collection of industrial statistics and the analysis of the performance of the region's industrial sector. It would be highly beneficial for all member states if regional data is made available for all members as an important input for evidence-based policy formulation. The set-up of a regional industrial observatory could be an interesting option for the EAC and SADC member states to explore. Such regional observatories could conduct regular industrial competitiveness analysis of the regions and issue regular policy notes on important industrial sub-sectors.

In line with the above discussions, the following policy recommendations on regional integration can be summarized:

- While pursuing the regional integration agenda, the Tanzanian government must be aware of the restrictions imposed in terms of limiting the range of future strategic industrial policy options.
- Tanzania must synchronize its national plans and strategies with the regional industrial policy as soon as possible.
- Greater coordination between the Ministry of Industry and the Ministry of EAC needs to be fostered towards effective implementation of the EAC regional industrialization policy.
- The EAC industrial policies should be an important consideration during trade negotiations, especially related to the EPA with the EU.
- Regional industrial policy must also focus on transforming the region as a whole into a better investment area for industries.
- The REC secretariats should be encouraged to establish regional industrial observatories that continuously monitor the competitiveness of regional industries and generate adequate industrial intelligence for informed policymaking.

8.8 Science technology and innovation for industrial development

Technological innovation is important because it provides economic benefits stemming from the sale of new or improved products as well as from new or improved production processes that increase productivity and efficiency – factors that are crucial for market access and competitiveness. The analysis in this report shows that the technology intensity of the Tanzanian manufacturing sector is very low, and even in the medium- and high-tech sectors, the products are at the lower end of the technology spectrum (e.g. rock-phosphate fertilizers and essential generic drugs). In addition, available innovation and technological capability studies indicate that Tanzanian innovation and technology is at best limited to the basic level, which means it is successfully imitating existing technologies and makes minor product and process modifications.[18]

Nevertheless, Tanzania is aiming to become a middle-income economy and wants to build a competitive manufacturing sector in the medium to long run. Accordingly, concerted efforts to build technological and innovation capabilities in industry are indispensable. Although the desirable path for industrial upgrading is to move towards medium- and high-tech sectors, Tanzania cannot immediately leap into the manufacture of high-tech products. Strategies for technological and innovation capability building must be based on the current situation, gradually moving up the innovation capability ladder.

18 For a more thorough analysis compare Diyamett, (2010) and Diyamett et al. (2011)

Tanzania must start deepening its innovation and technological capabilities through technology upgrading (incremental innovation and adoption of better technologies) in the currently existing and expanding low-tech and resource-based manufacturing sectors. This can largely be achieved through horizontal technology transfer[19]. There are several mechanisms through which international technology transfer can be effected, but the most common are:

- foreign direct investments (FDI)
- joint ventures
- licensing (from other companies)
- sub-contracting
- franchising
- technical service contracts
- turn-key contracts, and
- import of machinery and reverse engineering by local manufactures.

Among these, the most popular are FDI and imports. Tanzania has not, however, been able to effectively use these channels in the past. This can, to a large extent, be attributed to the lack of comprehensive and feasible technology transfer policies. For instance, Tanzania does not have a policy on FDI, making technology transfer through this channel unlikely (Diyamett, 2011). Much of the national emphasis on technology transfer is still on vertical technology transfer, defined as transfer of technology from lab to commercial organizations. A shift from promoting vertical to more horizontal technology transfers can promote an incremental upgrading of Tanzanian industry.

STI policy has a role to play in quality control by providing strong mechanisms to ensure that machines and products imported into and exported from Tanzania meet the security, safety, health and environmental requirements of the sanctioned standards and technical regulations approved by the Tanzania Bureau of Standards (TBS). This will guide technology upgrading and competition in the business sector. Similarly, STI policy should provide firms with mechanisms to test and ensure appropriate quality control of their products. Given the intensification of competition, guaranteeing product quality would provide confidence in firms to better participate in the supply chain. For micro, small and medium enterprises, technology extension services should be strengthened to enable them to identify needs and find appropriate solutions through targeted assistance.

19 Horizontal technology transfer refers to the acquisition of ready to use technology from another company or another country, in the case of international transfer of technology.

Tanzania needs to introduce concrete innovation and technology transfer policies. This, in turn, requires comprehensive, continuous and proactive innovation studies that continuously monitor and evaluate the innovation system for evidence-based policies. Currently, no government organization in Tanzania has been appointed to carry out this function. It is interesting to note here that as a result of a recent comprehensive review of its national system of innovation, South Africa has proposed the establishment of such a body. In addition, there is a need to foster mechanisms for funding Research and Development Centres for technology commercialization for the development and dissemination of improved technologies. Technologies can, however, fail to reach industries as a result of a lack of infrastructure facilities and funds for dissemination. Mechanisms should be provided to fund these centres of technology dissemination. The 'incubator model' discussed in the box below is a promising strategy for the promotion of technology and innovation in countries like Tanzania.

To summarize, we propose the following policy recommendations in the area of science, technology and innovation for industry:

- Tanzania needs an effective science, technology and innovation policy as soon as possible, which will provide guidelines on technology transfer and local technology development, in particular with regard to enhanced horizontal technology transfer.

- Such an STI policy must foster mechanisms to ensure quality control of both imported and exported products.

- An FDI policy must be drafted to facilitate effective technology transfer from transnational firms to local firms.

- A function needs to be established that continuously monitors and evaluates the innovation system within Tanzania.

- Centres for technological commercialization with adequate funding for technological dissemination need to be set up.

- Science and technology incubators should be established, initially as part of SEZs/EPZs, with strong links with local universities, with the aim of promoting technology transfer and new innovative enterprises.

Box 23: Role of incubators in science, technology & innovation

Business incubation, a concept that evolved in developed countries in the 1980s, has been found to be equally adaptable in developing countries (World Bank, 2002), especially in technology generation and the promotion of innovation systems. Incubation centres nurture new firms by providing technical and management expertise, finance, basic infrastructure and networks. Hanadi and Michael (2010) list the beneficial impacts of incubators, namely 'develop local economies, promote technology transfer, create new enterprises and generate jobs'. UNIDO (1999) identifies 'technology business incubators' for facilitating the development of enterprises with high-technology content. Recently, Kenya developed numerous incubators, in particular for businesses in ICT and mobile technology. But the experience of the South African Small Enterprise Development Agency (SEDA) incubators exemplifies how the incubator model can be successfully applied to industries ranging from wood processing to biotechnology. The SEDA technology transfer programme, linked with the incubation service, is a model worth emulating by other African counterparts in making the latest technology accessible for domestic firms. Bathula et al. (2011) state that domestic universities can play a crucial role in providing incubation services in emerging economies, which has an added advantage of creating linkages between universities and industry. Also, global networks like Infodev (a World Bank initiative) and African Incubators Network (AIN) provide platforms that facilitate incubation knowledge sharing across the globe. The main weaknesses of incubators in developing countries as summarized by Akçomak (2009) are '(i) focus on tangible services rather than intangible services, (ii) dependence on government, (iii) lack of management and qualified personnel, (iv) lack of incubator planning and creativeness in solving problems'. But despite these weaknesses, incubator services can provide crucial support to the development of technological upgrading and innovation systems in countries like Tanzania.

8.9 Skill development for industry

As indicated in this report, the Tanzanian industrial sector is currently dominated by low-tech production that does not necessarily require a large amount of highly qualified human resources. This finding is based on the responses of two-thirds of the companies surveyed, which indicate that their employees' low skill level suffices for current production activities. However, for those manufacturing firms aspiring and ready to move up the innovation capability ladder, the lack of qualified human resources can present a major stumbling block, as higher skilled employees seem to be in short supply in Tanzania.

According to the UNIDO skills survey for this report, companies operating in more complex sectors have expressed a need for more highly qualified employees which are not easy to find in Tanzania. These findings indicate a need for the government to address the skills gap to trigger an incremental transformation of the Tanzanian production structure.

The interplay between the supply and demand sides of industrial skills is highly complex. While the supply side essentially reacts to signals from the demand side, two major problems arise in this regard. First, by the time the demand for skills emerges in firms, it may be too late to start producing them, as technical knowledge can usually not be acquired in a short period of time. Second, the lack of demand for skills sometimes stems from a lack of proactive innovation strategies on the part of the firms. Some firms might have reached the threshold of moving up the innovation capability ladder, but simply because they do not have concerted and proactive innovation strategies, they fail to realize that they are in need of highly qualified human resources in certain areas of production and marketing.[20] Accordingly, government efforts to push Tanzanian industry into higher technology production activities through improvements of the industrial skill base must be complemented by efforts to make firms aware of the need for innovation strategies as an integral part of their business strategies.

On the basis of the industrial skills analysis presented in this report as well as the points raised above, a number of policy recommendations on skills development can be summarized:

- To significantly increase the overall level of industrial skill intensity within companies, skills policies should first rebalance the current allocation of public resources, favouring secondary education (in particular, numeracy skills) and more generally the development of production-related

20 As a case in point, according to Diyamett (2010), most firms in the metal working and engineering sector only innovate through routine activities of production and marketing - none of the 50 firms had a proactive innovation strategy.

skills combining formal and experience-based education.

- Skills policy should channel increasing public resources to vocational schools and training centres as well as promote experience-based skills development in the education system in general. Vocational schools and training centres develop skills targeted to industry-specific production tasks and therefore seem to offer a more appropriate and selective response to industries' needs and gaps.

- Overall, tertiary education curricula should aim at the formation of analytically skilled graduates with a problem-solving and proactive attitude. Also, given the fact that the skills gap is higher for STEM subjects and business graduates, skills policy should channel relatively more resources towards these disciplines and guarantee the achievement of certain standards of higher skills adequacy.

- Skills policy should facilitate the transition from the formal education system (especially higher education) to industries. Internships and 'bridging' programmes should be developed and supported. Students should also be supported in the creation of mixed curricula, including both formal knowledge and practical skills.

- Given the missing link between industries and the education system, in particular universities, skills policy should facilitate dialogue and the information flow by providing network services, opening and promoting the visibility of technology transfer offices within universities and enabling joint ventures between public research institutes and private companies through financial support schemes.

- Given the shortage of skills in the workforce, skills policy should facilitate the provision of incentives for retaining skilled workers. Skilled workers need better opportunities that companies should strive to provide. This includes an environment that attracts employees to stay longer and feel committed to the results of their work while providing experience, flexibility and creativity.

- Skills development must be in line with short-, medium- and long-term industrial strategies, along with technology foresight. For instance, Tanzania should already be investing in skills required by the gas and oil industry as it is likely that this will become a priority sector in the near future.

- A continuous innovation and skills needs survey should be considered to determine current and future skills needs in industry and beyond.

Box 24: Industrial skill development: Some best practices from Africa

The Government of Ghana recognized that the lack of competitiveness of its industrial sector mainly stemmed from its limited supply of skilled workforce, which was exacerbated by a lack of equitable and quality training opportunities to match the demands of key emerging sectors. The Government of Ghana decided to invest heavily in vocational training, higher education and science and technology. To realize the aims of its strategy, the government in association with AfDB recently initiated a US$ 108 million **'Development of Skill for Industry Project' (DSIP)**. The project action plan primarily involves the improvement and expansion of middle level Technical and Vocational Education (TVET), training facilities and promotion of national systems of apprenticeship. According to AfDB, this initiative 'represents a major innovation in its approach to technical and vocational skills development'.

Involving the private sector is very important for skills development. In Kenya, the **Jua Kali voucher project**, supported by the World Bank, provided skill and technology upgrading for about 25,000 entrepreneurs involved in micro and small enterprises. According to the scheme, eligible small firms can purchase vouchers for individualized technology and other business development services at 30-50 percent of the actual cost. The voucher system (during its pilot evaluation) has been found to have developed a market for a broad range of training, technology and business development services for the private sector. A major beneficial impact of the voucher system was the emergence of skilled craftsmen as the leading providers of training, and this revamped the neglected apprenticeship culture of the locality. This voucher system has several replicable policy lessons for countries like Tanzania.

Source: AfDB (2012) and Riley & Steel (2003)

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Annex 1. Data source and technological classification of exports and manufacturing value added (MVA)

The trade data source is the United Nations Commodity Trade Statistics Database (COMTRADE). The technological classification of trade is based on the Standard International Trade Classification (SITC) revision 3, and classifies all products in four categories: resource-based manufactured exports, low-technology manufactured exports, medium-technology manufactured exports and high-technology manufactured exports.

Technology classification of exports according to SITC Rev. 3	
Type of exports	**SITC sections**
Resource-based exports	016, 017, 023, 024, 035, 037, 046, 047, 048, 056, 058, 059, 061, 062, 073, 098, 111, 112, 122, 232, 247, 248, 251, 264, 265, 281, 282, 283, 284, 285, 286, 287, 288, 289, 322, 334, 335, 342, 344, 345, 411, 421, 422, 431, 511, 514, 515, 516, 522, 523, 524, 531, 532, 551, 592, 621, 625, 629, 633, 634, 635, 641, 661, 662, 663, 664, 667,689
Low-technology exports	611, 612, 613, 642, 651, 652, 654, 655, 656, 657, 658, 659, 665, 666, 673, 674, 675, 676, 677, 679, 691, 692, 693, 694, 695, 696, 697, 699, 821, 831, 841, 842, 843, 844, 845, 846, 848, 851, 893, 894, 895, 897, 898, 899
Medium-technology exports	266, 267, 512, 513, 533, 553, 554, 562, 571, 572, 573, 574, 575, 579, 581, 582, 583, 591, 593, 597, 598, 653, 671, 672, 678, 711, 712,713 ,714, 721, 722, 723, 724, 725, 726, 727, 728, 731, 733, 735, 737, 741, 742, 743, 744, 745, 746, 747, 748, 749, 761, 762, 763, 772, 773, 775, 778, 781, 782, 783, 784, 785, 786, 791, 793, 811, 812, 813, 872, 873, 882, 884, 885
High-technology exports	525, 541, 542, 716, 718, 751, 752, 759, 764, 771, 774, 776, 792, 871, 874, 881, 891

The data source for total MVA is the United Nations Industrial Development Organization (UNIDO) database. The data source for the value added of branches within the manufacturing sector is the UNIDO Industrial Statistics database. The technological classification of MVA is based on the International Standard Industrial Classification (ISIC), revision 2, and classifies all products in four categories: resource-based manufacturing, low-technology manufacturing, medium-technology manufacturing and high-technology manufacturing.

Technology classification of MVA according to ISIC Rev. 2	
Type of activity	**ISIC division, major groups or groups**
Resource-based manufacturing	31, 331, 341, 353,354, 355, 362, 369
Low-technology manufacturing	32, 332, 361, 381, 390
Medium-technology manufacturing	342, 351, 352, 356, 37, 38 (excl. 381)
High-technology manufacturing	3522, 3852, 3832, 3845, 3849, 385

Because reporting of data at the group (four-digit) level of ISIC is inadequate for separating medium- and high-tech products, the category “high-technology manufacturing” was not used; instead, medium- and high-tech (MHT) products were combined in one category. The sectoral shares of value added were then calculated in relation to the total for manufacturing subsectors.

List of Abbreviations

AfDB	African Development Bank
AGOA	Agricultural Growth Opportunity Act
ASIP	Annual Survey of Industrial Production
BOT	Bank of Tanzania
CAGR	Compound Annual Growth Rate
CIP	Competitive Industrial Performance
COMESA	Common Market for Eastern and Southern Africa
COMTRADE	United Nations Commodity Trade Statistics Database
CoET	College of Engineering and Technology
CTI	Confederation of Tanzanian Industries
EAC	East African Community
EPA	Economic Partnership Agreement
EPZ	Export Processing Zone
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
FYDP	Five Year Development Plan
GDP	Gross Domestic Product
HT	High-Tech
ICT	Information and Communication Technology
IIDS	Integrated Industrial Development Strategy
INDSTAT	UNIDO Industrial Statistics Database
ISIC	International Standard Industrial Classification
IT	Information Technology
LGAs	Local Government Authorities
LT	Low-Tech
LTPP	Long Term Perspective Plan
MDAs	Ministries, Departments and Agencies
MNCs	Multinational Corporations
MIT	Ministry of Industry and Trade
MT	Medium-Tech
MVA	Manufacturing Value Added
NBS	National Bureau of Statistics
NDC	National Development Corporation
NEMC	National Environment Management Council
NTBs	Non-Tariff Barriers
PMO	Prime Minister's Office
POPC	President's Office Planning Commission
RALG	Regional Administration and Local Government (in PMO)
RB	Resource-Based
RBDA	Rufiji Basin Development Authority
REC	Regional Economic Community
REPOA	Research on Poverty Alleviation (think tank)
R&D	Research and Development
SADC	Southern African Development Community
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SEAP	Structured Engineering Apprenticeship Programme
SEZ	Special Economic Zone
SIDO	Small Industries Development Organization
SIDP	Sustainable Industrial Development Policy
SITC	Standard International Trade Classification
SMEs	Small and Medium-Sized Enterprises
S&T	Science and Technology
SSA	Sub-Saharan Africa
STEM	Science, Technology, Engineering and Mathematics
STIPRO	Science, Technology & Innovation Policy Research Organization
TCIMRL	Tanzania China International Mineral Resources Limited
TBS	Tanzania Bureau of Standards
TDV	Tanzania Development Vision
TNCs	Trans-National Companies
UDSM	University of Dar es Salaam
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
UNIDO	United Nations Industrial Development Organization
URT	United Republic of Tanzania
VETA	Vocational Education and Training Authority
WDI	World Development Indicators
WTO	World Trade Organization
ZMTIM	Zanzibar Ministry of Trade, Industry and Marketing
ZNCCIA	Zanzibar National Chamber of Commerce, Industry and Agriculture

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