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Introduction

Adam Szirmai and Paul Lapperre

This collection of articles focuses on an analysis of the industrial experience of Tanzania since independence in 1961. Tanzania is taken as a case study of industrialization in sub-Saharan Africa because it represents many of the common features of industrialization processes in other African economies. What we need to understand is why some developing economies, which started from low levels of per capita income in the post-war period, achieved some measure of success in industrialization and economic development, while others did not. In this context the experiences of some Asian countries contrast sharply with the experiences of the majority of countries in sub-Saharan Africa. As Tanzania in many ways represents one of the models of African economic development, a careful analysis of its industrial experiences, and in particular the role of policy in these experiences, contributes to a better understanding of both Tanzanian and African economic development.

Common features of African development include the lack of an industrial heritage, the overwhelming importance of the agricultural sector in the post-war period, dependence on primary exports and a very small share of manufacturing in GDP and employment. In policy and development thinking industrialization was, and often still is, seen as the key to economic development. The fiery enthusiasm for industrialization was coupled with distrust of free-market forces, which were negatively associated with colonial experiences. A developmental state soon came to be seen as the main catalyst of development. Thus – irrespective of the precise shadings of ideology– state interventionism, state planning and state ownership of industrial enterprises increased all over Africa.

This is not to say that Tanzania has no distinctive features of its own. It has specific characteristics which distinguish it from many other countries. Apart from the intervention in Uganda in the 1980s, Tanzania succeeded in maintaining both peaceful relations with its neighbours and internal peace. Although the process of rural resettlement during the Ujamaa period, in the late 1960s and early 1970s, resulted in some measure

of forced relocation and disruption of agricultural populations, it avoided the extremes of Stalinist socialism, exemplified for instance by Ethiopia. Also there were undoubted successes in fields such as education and health care. Julius Nyerere was a political leader of exceptional integrity, who played a major role in maintaining ethnic harmony and building a sense of national identity. Tanzania was also characterized by peaceful changes of leadership and a smooth transition to a multiparty democracy in 1996, though marred by rising corruption.

In the late 1950s and early 1960s, after most countries gained their independence, hopes for rapid economic development were high across the African continent. Initially these hopes seemed to be well founded. Until 1973 income per capita and manufacturing GDP per capita tended to increase. From 1973 onwards, with country to country variations, a long period of stagnation set it. Apart from economic factors, political instability, corruption, military conflict and ethnic strife were major factors contributing to economic stagnation in most African countries.

As time went by, the perception of the role of the state started to change. Instead of being seen as a driving force in development, the state even started to be interpreted by some observers as a predatory and corrupt institution, diverting resources and human talent and effort from productive investment in economic development.

In the course of the 1980s, the international and national economic policy climate changed. Almost all countries, whether voluntarily or involuntarily, embarked on a process of structural adjustment, liberalization, deregulation, privatization and return to the market. Although there is a consensus concerning the shortcomings of state led industrialization, structural adjustment and economic reform have had mixed results in Africa. Despite some intimations of change there has, so far, seldom been a resumption of rapid sustained growth. Some sub-Saharan countries are even experiencing de-industrialization, and many are now faced with economic stagnation. In the case of Tanzania, political commitment to reforms seems to be quite strong and authentic. But, as illustrated by the articles in this volume, there is still a lively debate on the successes and failures of reform and on the future role of the state in the context of reform, liberalization and structural adjustment.

This book is structured into four parts. Part I focuses on long-run economic performance. It consists of two chapters on Tanzania and two chapters which place Tanzanian industrialization in a comparative international perspective. Part II brings together five articles dealing with issues of technology and innovation. Part III presents two articles on environmental and energy aspects of industrialization. Section IV brings together six articles focusing on economic reform and its prospects.

The volume combines contributions from economics, sociology and engineering. It complements articles focusing on macro trends, with

articles based on a wealth of information derived from firm-level surveys in various sectors of Tanzanian manufacturing. These provide new insights into the mechanics of industrialization, technological change and the responses to reform.

Part I opens with a chapter by van Engelen, Szirmai and Lapperre. The chapter provides an overview of the evolution of industrial policy in Tanzania since 1961 and the impact of policy on industrial performance. It describes the familiar process of increasing government intervention and the emergence of inward-looking import substitution, followed by painful attempts at adjustment, deregulation, opening up and reform. It argues that policy has had very significant, and after 1973 negative, effects on industrial performance. Instead of looking at policy rhetoric, the article focuses on indicators of actual policy implementation. This leads to different periodizations of policy regimes. The importance of such an approach is underscored by James's observations in Chapter 5. He shows that at the onset reform was more rhetoric than reality. During the first reform period after 1986, the role of the state in industrial investment initially even continued to increase.

Any discussion of economic policy requires adequate monitoring of economic performance by statistical institutions. The National Bureau of Statistics of Tanzania is involved in ongoing attempts to improve and revise national accounts and industrial statistics. In Chapter 3, Szirmai, Prins and Schulte try to make a contribution to these efforts by presenting newly revised estimates of manufacturing levels and trends. The authors find that the level of industrial value added has been seriously underestimated in existing statistics. The pattern of growth followed by decline, however, is even more pronounced than in earlier estimates.

The article also presents new indices of real labour productivity, which show dramatic secular declines in productivity since 1973. An international comparison of labour productivity indicates that Tanzania has been falling behind in a period when labour productivity in Asia was catching up with the lead economies. In 1989 value added per person engaged in medium- and large-scale manufacturing had declined to 3.9 per cent of that of the world productivity leader, the USA.

In a comparative study of the role of education in three African economies, Pack and Paxson present a critical discussion of the orthodox notion that African growth is skill constrained, and that expansion of education will in itself provide an impetus to growth of productivity. They argue convincingly that unless a complementary inflow of new technology takes place, educational investments will not lead to industrial development. In a non-competitive, inward-looking and stagnant setting, investment in human capital will have disappointing results. They are careful to point out, however, that once the economy starts becoming more dynamic, human capital and increased technological capabilities will also

become more important. In this respect it is important to remember that improved educational levels preceded economic growth in settings as diverse as Scandinavia, South Korea and Japan.

In a thought-provoking article, based on an analysis of the experiences of the Asian newly industrializing economies, Cooper attacks the preoccupation with technological upgrading. He argues that it is much more important for sub-Saharan Africa to find out how and why Asian NICs transformed themselves into labour-intensive exporters, and why non-NICS got stuck in import substitution which created vicious cycles of inefficiency. Though final answers are not forthcoming, the orientation of government policy was certainly one of the relevant factors in the transformation. A second issue raised in the article is that of technological change in so-called early, labour-intensive, industries. Even in labour- intensive sectors such as textiles or leather, the pace of global technological change is accelerating. This creates special challenges for late late industrializers who now want to enter world markets. Even countries with a potential comparative advantage in labour-intensive production have to make substantial efforts to keep abreast of world technological developments.

In the early stages of industrial development, technological innovation is primarily a question of taking over and adapting technologies developed in the advanced economies. However, the process of technology transfer is not effortless. It is itself a type of innovation which requires considerable effort and capabilities. The success with which developing countries take over technologies, depends to an important extent on their technological capabilities: their capacities to select, acquire, adapt and further develop internationally available technologies and to integrate them into the domestic economy. The five articles in Part II reflect different aspects of this complex of problems.

In Chapter 5, James presents a political economic analysis of the role of the Tanzanian state in technology selection, and provides interesting examples of the lack of economic rationality in the investment process. The main driving force in technology selection consists of bureaucratic managers maximizing project size and budgets in negotiations with international donors. James uses this perspective to clarify two paradoxes in technology selection: different technology choices in similar industries, and a preference for capital-intensive projects in a country with a labour surplus.

In Chapter 6, Semboja and Kweka discuss innovative strategies of firms. They note that, with the exception of a few firms with international partners, innovation and technological changes have been very limited in scope. They go on to discuss the factors influencing innovativeness and the obstacles to innovative behaviour. These obstacles include a shortage of technical skills in the labour force, a low volume and ineffective coordination of firm-level R&D, insufficient orientation to export markets – the

literature emphasizes that exporters are forced to innovate and to meet international quality standards – , insufficient financial resources, a weak institutional framework for science and technology support, and weak links between innovation research centres and users.

The issue of technological capabilities is also central to the article by van Egmond in Chapter 8. She defines technological capabilities in terms of four components: stock of technology, stock of human resources, stock of natural resources, and technology infrastructure. She argues that technological capabilities are very important for successful technology transfer. Operationalizing the four components, she goes on to map the capabilities of the dwelling-construction industry, identifying weaknesses and bottlenecks.

The literature on national systems of innovation emphasizes the crucial importance of fruitful interaction and strong networks and linkages between enterprises and science and technology institutes. The importance of the science and technology infrastructure is stressed by various authors in this volume. Chapter 7, by Bongenaar and Szirmai, focuses specifically on a case study of the functioning of the Tanzanian Industrial Research and Development Organisation (TIRDO). TIRDO is an R&D organization, which explicitly aims at developing and adapting technology for domestic industry. A detailed analysis of TIRDO projects indicates a considerable degree of technical project success. In terms of transferring technologies to enterprises, however, the record is very disappointing. The organization tends to operate on the assumption that good technologies should sell themselves. Therefore, insufficient attention is paid to networking, marketing and transfer activities. The case study provides a clear illustration of the weakly developed linkages between publicly funded R&D institutes and enterprises.

In Chapter 9, Duijsens and Lapperre focus on one important component of technological capabilities: technical education. In a survey study of 28 enterprises, they investigate the supply and demand for technical education in the metalworking sector. At all educational levels, major shortcomings are identified with regard to knowledge of modern metalworking techniques, awareness of safety-related aspects, awareness of preventive maintenance, striving for excellence, and mastery of English. In an analysis of the institutional sources of shortcomings, interestingly enough, the use of English as the language of instruction is identified as one of the major problems, as both teachers and pupils have insufficient mastery of the language.

Part III opens with Chapter 10, by Lemmens and associates, on the assessment of environmental impacts of productive and household activities. This article develops an ingenious methodology to assess environmental impacts in data-poor situations, which is of special relevance for developing economies such as Tanzania. It uses standard pollution factors for productive outputs and human activities.

The method is initially applied to Lake Victoria where, as it turns out, industry is far less important as a source of different types of pollution than households, agriculture and wet deposition. Though industry may not yet be important at an aggregate level, point pollution turns out to be more serious, especially in major urban centres, such as Dar es Salaam, and in small-scale gold mining.

A link between industrial productivity and environmental considerations is provided by energy efficiency. An increase in energy efficiency increases firm productivity and profitability, while at the same time reducing the burden on the environment associated with increasing industrial production. Though some might argue that in a poor country such as Tanzania economic development and industrialization take precedence over environmental considerations, van der Vleuten, Lemmens and associates argue persuasively in Chapter 11 that there are ample opportunities for leapfrogging to cleaner production. Their conclusions are based on meticulous studies in beer brewing and cement production.

Tanzania is now trying to move towards export orientation and privatization. As various authors indicate, Tanzania is swallowing the IMF and World Bank medicine of deregulation, export orientation and privatization more wholeheartedly than many other developing countries. The chapters in Part IV focus on the reform process. On the one hand, they reflect on the lessons to be learned from past experiences; on the other they analyse the impact of reforms and make suggestions about future paths to be followed.

In the opening chapter in Part IV, Lapperre puts Tanzanian industrialization in a historical comparative perspective, and asks what lessons can be derived for Tanzania from the industrial history of Western Europe. He makes systematic comparisons between the historical prerequisites for industrialization in the past, and present conditions in Tanzania. Such historical comparisons are valuable since every 'advanced' country was once a 'developing' one. However, one has to be careful, because countries do not necessarily follow identical paths of development, and the international context facing late developers may be very different from those of the first movers. This point is well illustrated in the chapter by Cooper, who points to accelerated global technological change in labour-intensive sectors such as textiles.

One of the important prerequisites cited by Lapperre is that industrialization requires prior increases in agricultural productivity. Other important preconditions for successful industrialization have to do with the crucial importance of political stability and efficient, predictable and non-corrupt government. Lapperre also presents an analysis of attitudes and social institutions, such as for example extended family ties, which may be unfavourable for industrialization. With regard to education, the message is mixed. Lapperre indicates that increased formal education has not always

been essential for early industrial development in Europe. Like Pack and Paxson, he doubts that simply increasing formal educational levels will provide solutions to Tanzania's economic problems. On the other hand, many of the articles in this volume (van Egmond, Duijsens and Lapperre, Semboja and Kweka) emphasize the importance of improving education and in particular technical education.

An article on the informal urban manufacturing sector by Gaillard and Beernink has a dual purpose. On the one hand, the authors criticize the neglect of the informal sector in past policy thinking and practice. On the other hand, they present a state of the art of informal-sector studies, both in Tanzania and worldwide. They are very critical of the scientific quality of informal-sector studies, concluding that this branch of research is still in a pre-scientific stage. Therefore, it is of less use for the formulation of well-specified informal-sector policies than is to be desired. Nevertheless, the authors do conclude on the basis of the available information that the relevance of this sector for economic development is very substantial in terms of employment, output, income generation and learning potential. In 1991 no less than 56 per cent of the urban active population in Tanzania was working in the informal sector, generating 32 per cent of total urban income. Gaillard and Beernink try to identify the main constraints for the future growth of this sector, which include: limited access to credit, lack of equipment and spare parts, and limited access to more permanent sites. Training is mentioned least frequently by respondents, as the informal sector is largely self-supporting with regard to training. However, the authors conclude that from a long-run perspective, training for upgrading labour in the informal sector should be part of the policy package.

The articles by Mbelle, Moshi and Wangwe all focus on the process of reform and structural adjustment. It is important to note that there is consensus concerning the shortcomings of the model of state-led import-substitution industrialization dominant in the past. None of the authors advocates a return to this model. However, their assessments of ongoing reform policies and their outcomes are mixed.

In Chapter 15, Moshi provides two interesting case studies of major firms that have experienced a marked turnaround since their privatization, with increases in sales, productivity, competitiveness and profitability. In an econometric article on the impact of liberalization in chapter 13, Mbelle starts by noting that important macroeconomic indicators, such as manufacturing growth and employment, have started improving since 1994. For 1998 he even records a GDP growth in manufacturing of 8.1 per cent. GDP growth in the total economy has also picked up in recent years (Table 1.9). Like Wangwe, Semboja and Kweka, and Moshi, he also points to increased technological dynamism and 'offensive strategies' in some of the manufacturing firms.

On the basis of econometric analyses Mbelle concludes that manufacturing exports responded positively to liberalization after 1993. However, the share of manufacturing in investment tended to decline. Mbelle concludes that macroeconomic policies in themselves are not enough. Sector-specific policies are needed to ameliorate some negative sectoral impacts of macro-policies.

Much the same conclusion is drawn by Wangwe in chapter 16. On the basis of a survey of recent literature he concludes that restructuring entails more than macroeconomic reform. He is particularly concerned with the fact that, while liberalization does expose formerly protected firms to competitive pressures, there are still no strong inducement mechanisms for technological change and improving technological capabilities. In view of Cooper's conclusion that developing countries that want to enter world markets in labour-intensive exports are faced with more technological change than before, this is an important finding. Wangwe goes on to identify the main factors which need to be tackled by policy. They include: improving institutional capacity to provide supportive technological services to industry, improving linkages between economic activities and between establishments and R&D institutions, improving the provision of infrastructure, investing in human resource development and making labour processes more conducive to learning. He identifies three major priorities: policies aimed at technological learning and building competitiveness, priority of agro-based small and micro-enterprises, and enhancing the capability of government to complement the opening-up process of the economy with supportive policies.

In the final chapter Maziku summarizes Tanzanian policy intentions contained in the recently drafted Sustainable Industrial Development Policy (SIDP) document for the period up to 2020. The new policy formulation addresses many of the issues discussed in this book. Maziku rightly emphasizes that one of the important new elements in policy making is a consultative mechanism for policy implementation, in which a revived private sector and the government are expected to cooperate and interact. Though this volume stresses that policy implementation is far more important than policy intentions, the SIDP certainly provides an indication of the extent of change in policy thinking.

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