IV.2. COMPETITION POLICY, MANUFACTURING EXPORTS, INVESTMENT AND PRODUCTIVITY: FIRM-LEVEL EVIDENCE FROM TANZANIA MANUFACTURING ENTERPRISES

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Executive Summary

The major objective of this study is to answer the question: to what extent is firm-level performance measured by investment, productivity and export influenced by government measures aiming to stimulate competition and protect consumers against monopoly? To analyse this influence, the study assesses the effect of control of dominant firms through institutions, the effect of mergers to prevent industries becoming monopolized and the effect of control of anti-competitive behaviour. The analysis focuses on assessing firm-level effects due to existing government efforts to regulate business activity in order to ensure that it operates in the public interest. In particular, the study analyses the role of competition policy in influencing productivity, investment and export performance of Tanzanian manufacturing enterprises. The study focuses on the hypothesis that fair competition has a causal impact on the quality and quantity of manufactured exports, productivity and investment.

In fulfilling the study objective, the following issues are covered: a thorough literature review that provides, among other things, the theoretical framework on which the empirical analysis of the study is based. Previous findings and conclusions regarding the topic under investigation are also presented. The other issue covered by the study is an empirical study of the Tanzanian case. This section provides direct evidence based on microeconomic data of how the existing government policy and institutions charged with overseeing fair competition have succeeded in ensuring competitive production that is fair and in line with the public interest. The empirical approach of this case study focuses on identifying, describing and measuring variables that link competition policy and firm performance, and assessing the impact of legal and institutional structures of competition policy and the related policies on domestic firm performance. Specifically, the study estimates the probability functions for investment, productivity and exports and the production functions in which competition policy and competition variables are among the independent variables. The final issue covered in the study is the question: what are the prerequisites for the successful implementation of competition policy in developing countries and the mechanisms through which this may operate? The study findings are used to provide this perspective.

The study argues that, prior to the 1980s, competition policy played little role in most developing countries. It was contended that free trade did not allow a true comparative advantage situation to develop due to differences between marginal social and marginal private costs. Based on this argument, industrialization in most of the developing countries was undertaken through highly protective industrial and

trade policies particularly through the infant industry argument for protection. The presence of a large state sector partly explained why many developing countries did not find it necessary to have a competition policy. While there were some gains in industrialization, the general performance of inward-looking protected industrialization programmes was not very successful. High effective rates of protection resulted in monopolistic enterprises which were characterized by high investments but with low rates of capacity utilization, falling value added and total factor productivity, over-reliance on government subsidies and generally inefficient industrial bases in most developing countries.

Nonetheless, the 1990s have seen a reversal of trade and industrial policies in developing countries. This decade was marked by comprehensive economic reforms, aimed at moving away from state control towards a market economy. After the introduction of the reforms, it is not difficult to see why the need for competition policy becomes crucial in developing countries. The basic assumption of the market-based economy is that the competitive process will ensure the efficient allocation of resources which is essentially a self-correcting mechanism, and that intervention will be required only occasionally to correct temporary imperfection. However, in practice, markets exhibit some form of imperfect or monopolistic competition even in the absence of a state monopoly. Sometimes reform measures such as privatization can simply involve replacing the public monopoly with a private one.

To account for the limitations of the market economy, many governments in developing countries have established laws and institutions to regulate economic activities. The introduction of competition policy and the creation of antitrust authorities are some of the steps taken to facilitate such regulation. The specific areas targeted by the competition policies and antitrust authorities include (i) control of dominant firms by regulation, (ii) control of mergers to prevent industries becoming monopolized, and (iii) control of anti-competitive acts, such as predatory pricing. The main goal of competition policy is to facilitate competition that brings economic benefits through greater efficiency, lower prices, greater choice and higher product quality. The interaction of competition and long-term firm performance in terms of such aspects as exports, investment and productivity movements is less well understood. The analysis of this study is thus a contribution to this area. Our data set permits us to investigate various measures of competition and competition policy. We first test for the possibility that competition policy can be one of the determinants of firm performance, and then assess how the introduction of competition into production has influenced performance at firm level.

Our empirical results given in this chapter do not indicate that firm performance has been adversely affected by competition policy. Distinctively, we find a positive relationship between competition policy with productivity, investment and export. For the export and investment performances, the results are stable even when we consider unobserved firm-specific attributes. For the productivity effect of competition policy, the results are influenced by firm-specific attributes suggesting that the posi-

tive relationship between competition policy and firm productivity is highly dependent on firm-specific characteristics. The other findings of the study are that there is a negative impact of competition on certain firms. In particular, firms that regard competition as one of the three biggest production problems have more difficulty in enhancing exports, maintaining productivity and investing. We point out that such findings form a basis for the need to adopt competition policy as an intervention mechanism, to minimize the adverse effect of competition.

The analysis of aggregate manufacturing sector statistics undertaken in this chapter also do not show any clear evidence that sector performance measured by export and investment has been affected adversely by the introduction of competition policy – indeed all these variables at some point have shown an up-and-down trend that might be due to factors that have less to do with competition policy. We have evidence of high concentrations in Tanzanian manufacturing and the existence of anti-competitive behaviour, which have been reported to the fair competition department. It is true that the policy may have affected the specific firms that were reported to the commission. However, based on the information about investment and export behaviour of some of the firms, we find no major effect, and our data do not provide support for the view that anti-competitive behaviour through a means such as false advertisement are helpful to their performance. In fact, such companies have retained their position and some have their performance improved even after being dealt with by the competition laws.

To address the question on what are the prerequisites for the successful implementation of competition policy in developing countries, we first argue that there are specific characteristics in developing countries which pose a great challenge for policy makers when designing an appropriate competition policy that will bring about economic development, restrain anti-competitive behaviour, limit abuses of monopoly power, and promote industrial development. For instance, whereas market entry and access are the key elements of market economies that many developing countries are currently striving to achieve, in practice, promoting the conditions for wider market access and efficiency through competition has been a difficult challenge. In most developing countries, the market or indivisible hand does not always operate very smoothly and indeed instances of market failure are rather frequent. The other limits to competition policy design in developing countries are the existence of large informal activities, lack of well-defined property rights, limited environmental, safety and health standards, underdeveloped consumer protection institutions and laws, limited capability to verify and check standards, lack of technical expertise and experience in competition policy and limited institutional capability in areas of competition and antitrust. The prerequisites for the successful implementation of competition policy in developing countries are therefore: a sound competitive environment in other economic sectors and policies that are directly or indirectly linked to competition policy, establishment of production standards, defined property rights, consumer protection agencies organized as an efficient institutional framework with adequate human,

technical and financial resources, harmonization of competition policy with those of countries with similar characteristics and/or economic partners, establishment of procedures and methods that can allow the monitoring of competition, ensuring that competition is legally protected and provides settlement for disputes through appropriate institutions with adequate knowledge of competition matters, improving the system of data collection and reporting on competition matters, e.g. changes in industrial concentration, changes in market power, investment behaviour of the producing firms, and other possible measures of competition, encouragement, and facilitating training in disciplines necessary for the competition policy implementation such as competition law, and an economics field that has a strong emphasis on competition aspects and the related fields.

1. Introduction

This study assesses the role of competition policy in influencing productivity, investment and export performance of Tanzanian manufacturing enterprises. We focus on the hypothesis that fair competition has a causal impact on the quality and quantity of manufactured exports, productivity and investment. The study's main argument is that the presence of a competitive environment motivates firms to consistently make different decisions regarding investment, training, technology and the selection of inputs, and thus raises their productivity. However, in the absence of fair competition, the quality and quantity of investment and productivity, along with the extent of export performance, might be impaired. It is only through fair competition that domestic firms, which target global markets, can be assured of future certainty, which gives them substantial incentives to invest in improving the efficiency of their operations to support technology transfer through a variety of means to economies with favourable factor endowments – including direct investment. By examining the patterns of manufacturing productivity, investment and export across Tanzanian manufacturing firms, we will attempt to show how the extent of openness and the competitiveness of markets affect the relative performance of manufacturing firms.

The major study objective is thus to investigate the extent to which firm-level performance measured by investment, productivity and export are influenced by government measures aiming to stimulate competition and protect consumers against monopoly. To analyse this influence, the study assesses the effect of control of dominant firms through institutions, the effect of mergers to prevent industries becoming monopolized and the effect of control of anti-competitive behaviour such as full-line forcing and predatory commission. In particular, the study assesses the existing government efforts to regulate business activity in order to ensure that it operates in the public interest. The study asserts that, whereas there are advantages of competition policy, its adverse effects cannot be ruled out. Firms facing actual or potential competitors will, in theory, concentrate on improving their products and lowering production costs. However, the threat poised by competition may be so severe that it leads to closure of weak incumbent firms. This explains why governments would wish to regulate business activity in order to ensure that it operates in the public interest.

The motivation of the study is that about a decade ago competition policy played little role in most developing countries. It was contended that free trade did not allow a true comparative advantage situation to develop due to differences between marginal social and marginal private costs; hence, there was a need to temporarily protect trade during its initial high-cost period until the correct pattern of international specialization is established. Based on this argument industrialization in most developing countries was marked by highly protective industrial and trade policies, especially under the infant industry argument for protection. While there were some gains in industrialization, the general performance of inward-looking protected industrialization programmes was not very successful. High effective rates of protection resulted in monopolistic industrial enterprises which were characterized by high investments but with low rates of capacity utilization, falling value added and total factor productivity and over-reliance on government subsidies, hence leading to an inefficient industrial base.

It was during that era that Tanzania strived to achieve state-led development. To facilitate development, the government controlled all markets and directed various projects. Investment was targeted as the government tried to allocate resources directly through systems of control such as business licenses. Through the infant industry argument, Tanzanian manufacturing firms were highly protected against foreign producers through a restrictive trade policy, an imposition of local content requirement, a technological transfer requirement and a ceiling on profit repatriation. Initially, the manufacturing sector generated significant growth, especially in the 1970s, but from the late 1970s this growth halted. The sector faced high rates of effective protection, an absence of competition and decreasing capacity utilization factors that resulted in decreasing efficiency and increasing costs (Ndulu, 1986).

The economic reforms adopted in the mid-1980s have shown some signs of recovery, such as a positive real growth rate and increased participation of the private sector in production. Nevertheless, as in many other developing countries, competition in broad international markets has not resulted in significant responses in elastic demand-induced improvements in productivity, investment and exports. The manufacturing exports are still a small proportion of the total country exports. Even in the domestic market, Tanzanian manufacturers have been facing stiff competition from imported cheap manufactured products. After the collapse of the state-controlled economy, Tanzania has shown considerable efforts to attain the competition policy that is relevant to its own local environment, which will regulate economic activities in line with public interest and discourage anti-competitive behaviour. This study is thus particularly relevant currently where Tanzania's stage of industrialization is associated with substantial changes in manufacturing organization and technology and poorly integrated markets.

Despite major changes regarding the competitive environment in which the manufacturing sector operates, the interaction of competition and long-term firm performance in terms of such things as exports, investment and productivity movements is

less well understood. For instance, the move from the state monopoly towards a market-oriented system involves both the elimination of protections and the introduction of competition. On the other hand, competition subjects firms to continuous threats from new suppliers, products or processes. The potential role of competition policy after liberalization is to enhance the effectiveness of competition in reallocating market shares between firms, inducing improved performance in existing firms, inducing entry by more, rather than less, efficient firms and expediting the exit of inefficient firms. Recent empirical works that establish the significance of within-firm impacts of competition on performance highlight the fact that there are welfare gains available from heightened competition. The antitrust authority has to find out whether the competition enhances firm performance.

In this chapter, we therefore use firm-level information to investigate whether the competitive environment in which the manufacturing firms of Tanzania operate increases productivity growth, investment and exports, along with an investigation into any anti-competitive behaviour and its effect on firm performance. We provide direct evidence based on microeconomic data of how the existing government policy and institutions charged with overseeing fair competition have succeeded in ensuring competitive production that is fair and in line with the public interest. The study further identifies gaps and the need for policy changes and/or institutional restructuring to cater for the new production environment within which the Tanzanian manufacturing sector operates. The data used are the employer-employee matched firm-level data obtained from Tanzanian Manufacturing/RPED surveys which contain detailed information on company-level performance and other firm characteristics. The data used contain information on the extent to which firm managers rank competition from both local and foreign firms among the three biggest problems facing their companies. With regard to this, managers are asked how often they had any dispute with their competitors and how such disputes were resolved. Finally, there are questions aimed at assessing the effectiveness of the existing institutions and regulations in enhancing fair competition in Tanzanian manufacturing.

The structure of the chapter is as follows. In section 2, we provide the link between competition policy, competition and firm performance and review the literature that analyses the impact of competition policy on firm performance. The discussion in this second section provides guidance as to the relative importance of competition policy for firm performance. In particular, it provides, among other things, the theoretical framework on which the empirical analysis of this chapter is based. Previous findings and conclusions on the related analysis are also provided in this section. The third section uses aggregate statistics from the Tanzanian manufacturing sector to evaluate export performance, investment and competition in Tanzanian manufacturing. The discussion considers changes in industrial performance along with industrial and trade polices of Tanzania over the 1960–2003 period. The fourth section discusses the theoretical framework of the study, data and models estimated. The fifth section describes the impact of competition policy on firm firm-level performance

while the sixth section discusses the empirical estimates of the productivity effects of competition and the impact of competition policy on firm-level performance based on the Tanzanian case. The emphasis in section seven is on an examination of the effect of competition policy on investment and export performance of a firm. Section eight examines market power concentration and competition policy in the Tanzanian manufacturing sector. The summary and conclusions are given in section nine. In particular, this section outlines the prerequisites for the successful implementation of competition policy in developing countries and the mechanisms through which it may operate, based on the study findings and experience from related works.

2. Competition policy, competition, firm performance and some empirical evidence

This section examines the links between firm performance, competition policies and competition. First we provide a definition and justification of competition policies and then we review the empirical and theoretical literature concerning competition policy and firm performance. Specifically, we undertake a thorough literature review that provides, *inter alia*, the theoretical framework on which the empirical analysis of the study is based. Previous findings and conclusions regarding the topic under investigation are also summarized in this section. In the previous section, we pointed out that, before the 1980s, competition policy did not exist in many developing countries. In particular, we showed that there was an infant industry argument that justified industrialization under highly protective industrial and trade policies in many developing countries. But since the introduction of the comprehensive economic reforms of the 1980s, it is not difficult to see why the need for competition policy becomes crucial in developing countries. Prior to the 1980s, many manufacturing firms in developing countries were natural monopolies under state ownership. The presence of a large state sector partly explained why many developing countries did not find it necessary to have a competition policy. However, the need for competition policy is called for in the new liberal market-based "outward-looking" economy. The basic assumption of the market reforms introduced after the economic reforms is that the competitive process will ensure the efficient allocation of resources, that it is essentially a self-correcting mechanism, and that intervention will be required only occasionally to correct temporary imperfection.

To facilitate competition, many developing countries have privatized the former state-owned firms. However, privatization and liberalization are necessary, but not sufficient, conditions for eliminating monopoly and market imperfections. In practice, markets exhibit some form of imperfect or monopolistic competition even in the absence of a state monopoly; hence, privatization as a process can simply involve replacing the public monopoly with a private one. If there are fewer firms then they can have scope to exercise their market power to manipulate the market in favour of firm-specific interests. In fact, some authors in this area argue that the creation of artificial barriers, for example, can allow such firms to earn excess profits without new entrants being able to compete to bring prices down. There are many other

forms through which manufacturing activities can be subjected to the adverse effects of competition.

To account for the limitations of the market economy, many governments in developing countries have established laws and institutions to regulate economic activities (including manufacturing-related activities) so that they operate in the public interest. The specific areas targeted by the competition policies and antitrust authorities include (i) control of dominant firms by regulation, (ii) control of mergers to prevent industries becoming monopolized, and (iii) control of anti-competitive acts, such as predatory pricing. In the manufacturing sector, competition policy aims at preventing restrictive practices, such as manufacturers insisting on a minimum retail price. Cartels and agreements prevent, restrict, or distort competition. The idea behind the introduction of competition policy is to ensure that competition brings economic benefits: it leads to greater efficiency, lower prices, greater choice and higher product quality.

There are other justifications for the competition policy in the manufacturing sector. The sunk cost argument for regulation, whereby there might be barriers to entry into markets stemming from the high sunk costs of establishment is one such justification. The competition policy is expected to ensure that the behaviour of the incumbent, i.e. the already established firm, does not contribute to artificial sunk costs. In the same way, the competition policy should protect the incumbent against entry that can lead to unexpected losses such as an inability to recover the sunk costs, e.g. technological duplication. It has been emphasized that the need to sink costs is not a barrier to entry if the entrant can invest in new technology with a performance advantage over obsolescent technology. There are also wider benefits of competition in that if firms are efficient, their international competitiveness will improve and the economy will see higher exports, lower imports and more employment.

The literature examining the effect of competition on firm performance is diverse. There have been numerous studies linking competition policy and competition with various firm performance indicators such as productivity, exports, investment, growth and profitability. The literature classifies the analysis of the relationship between competition and productivity into three sources from which the link between competition and productivity can arise. Firstly, following the observation of Hicks (1935), increased productivity under competition could arise from better incentives for workers and managers, and hence a reduction in slack and inefficiencies, in a competitive environment. Secondly, competition could improve productivity by providing better incentives for innovation. This is illustrated in endogenous growth frameworks where competition provides stronger incentives to adopt new technologies (Aghion, Harris and Vickers, 1995; Aghion and Howitt, 1996; Aghion, Dewatripont and Rey, 1999). A third strand of theories stresses the role of competition in weeding out inefficient firms through a dynamic process of entry of new firms, exit of unproductive firms and reallocation of output from less productive to more productive firms. The Melitz model also predicts increased productivity following trade liberalization.

There have been studies linking competition and productivity. Evidence of the effect of competition on the level of productivity is provided in studies by Nickell, Wadhwani and Wall (1992) and by Hay and Liu (1994). In these studies, a positive correlation between competition and productivity is reported. A contrasting, positive effect of high concentration (reflected in a positive correlation between market share and productivity growth) on productivity growth was found by Nickell (1992), whose later study (Nickell, 1996) suggests a positive effect of competition (measured by increasing number of competitors or lower rents) on productivity growth. The literature examining the effect of competition on technical efficiency is summarized in Nickell (1996). Studies by Caves and Barton (1990), Green and Mayes (1991) and Caves *et al*. (1992) suggest that an increase in market concentration tends to reduce technical efficiency.

In several studies, it has been theoretically modelled and empirically verified that increased import competition tends to reduce domestic cost-price margins in concentrated industries. Scherer and Huh (1992) note that some US firms react aggressively to increased import competition by increasing their R&D expenditure, while other firms react submissively. Bernard and Wagner (1997) found that, in Germany, exporters were more productive than their non-exporting counterparts. Bernard and Jensen (1999) made a similar observation regarding US manufacturers. Helpman and Krugman (1989) give an exposition of a wide range of models incorporating different modes of imperfect competition that share the common feature that abolition of institutional trade barriers reduces the mark-up.

There are studies which have assessed the effect of investment on local firms. Liu and colleagues (Wei *et al.*, 2000) consider productivity effects of foreign investment in the UK. For the 1991–1995 period, they found that foreign investment has been beneficial for the productivity of UK-owned firms in the same industry. Instead of the anticipated convergence of productivity levels between domestic and foreign firms, which means that domestic firms would need higher productivity growth rates than foreign ones to catch up, they found evidence to the contrary, indicating that the gap between foreign and domestic firms is widening.

Blomström and Sjöholm (1998) found that foreign establishments have a relatively higher level of labour productivity, but that domestic firms benefit from spillover effects (also in terms of labour productivity). Anderson (2001), using panel data on Indonesian manufacturing establishments for the 1980–1995 period, also found productivity spillovers from foreign to purely domestic enterprises. Kokko (1994) established similar positive effects for labour productivity in Mexico. Blomström and Wolff (1994) also concluded that, during the 1965–1982 period, foreign presence significantly influenced the rates of growth of productivity of local Mexican firms. Positive results are also found by Kokko *et al.* (1996) for the Uruguayan manufacturing industry.

Several other studies have also found negative effects of foreign investment on the productivity of local firms. The overall effect of foreign participation on the productivity of the entire industry was weakly positive. Studies by Haddad and Harrison (1993) for Morocco and Aitken *et al.* (1996) for Venezuela and Mexico also showed no positive spillovers in productivity and wages, respectively. A study by Kawai (1994), using a set of Asian and Latin-American countries, indicated that an increase in foreign investment had a generally negative effect on productivity, though positive results could be established for some countries.

There is limited empirical evidence concerning the impact of competition policy on firm performance. A few authors who have analysed this aspect have based their studies either on advanced countries or transition economies mainly in eastern Europe. Gonenc, Maher and Nicoletti (2000) surveyed the effect of regulatory reform in OECD countries. They focused on previously regulated industries – both competitive and non-competitive. Their studies provide evidence that competition policy results in improved static and dynamic efficiency, enhanced quality and lower prices to consumers. Dutz and Vagliasindi (2000a,b) measured the effect of competition policy rules and implementation on competition in a transition context. In the first study (Dutz and Vagliasindi, 2000a), they measured competition by enterprise mobility: an economy-wide indicator that captures the frequency with which private enterprises expanded employment over the 1997–1999 period, weighted by the corresponding proportion of expanding firms that increase labour productivity. They explained this enterprise mobility measure by average market concentration, average pressure of foreign competition, competition policy rules (constructed as explained in the previous subsection), competition policy implementation (see above) and corporate governance in 18 transition countries. They found that both rules and implementation improve enterprise mobility and that the effect of implementation is more important. They also found that more adequate corporate governance and stronger foreign competition increase economy-wide enterprise mobility, while the greater the average market concentration the smaller the measured enterprise mobility. In the second study (Dutz and Vagliasindi 2000b), their dependent variable is the average frequency with which enterprises faced a more competitive environment (the proportion of firms facing at least one competitor in the domestic market) in 1999. They constructed this variable for 20 transition countries and explain it with twice-lagged competition policy implementation and the change of the implementation over the previous 2 years. They also use the overall state of privatization and variables assessing the hardening of the budget constraint as explanatory variables.

Despite the differences in empirical approach, methods and variables used in the studies reviewed in this section, it is possible to draw some general conclusions. First of all, estimating the effect of competition and competition policy on firm performance in most of the studies presented generates positive effects. However, there are problems in estimating the effect of competition and competition policy on firm performance particularly endogeneity, specification of production function and input

measurement. There is a potential simultaneity problem when estimating production function especially when firm performance is correlated with firm-specific characteristics. Estimates that do not control for these effects may be thus biased. In this study, we control for this bias by estimating the firm fixed-effects estimates. We have seen, for instance, that studies that control for such heterogeneity find significant influence of the fixed effects on estimated coefficients.

The other important issue from the literature presented above is that the inclusion of a broad variety of additional firm characteristics improves the estimation and reduces the measured competition impact. Estimations excluding such variables may therefore be biased. It may also be the case that competition measures may pick up the performance effects of other variables that are frequently closely correlated with market and overall macroeconomic conditions. For instance, the Tanzanian manufacturing sector experienced huge investment growth during initial efforts to establish large state-owned firms, a factor that is not correlated with the existence of competition. In this study, we present panel data from the Tanzanian Manufacturing Enterprise surveys. We are thus able to use the panel dimension of the data to control for the unobserved time-invariant firm characteristics when estimating the impact of competition on firm performance. We estimate a production function with labour and capital inputs, and augmented by competition policy and competition variables. To account for the problems arising due to type, specification of production functions will estimate both the value added and the gross output production functions.

3. Export performance, investment and competition in Tanzanian manufacturing

In this section, we discuss the relationship between competition policy export performance and competition policy in Tanzania based on the manufacturing sector performance. The analysis is based on the aggregate statistics of the manufacturing sector. The data used are the annual surveys of industrial production, the industrial census over the 1966–2002 period. The time series trend enables an assessment of the changes in the exports and investment performance before and after the competition policy was introduced. Given that the competition policy was introduced in 1994, our competition variable takes the value of 1 for the post-1994 years and 0 for the years before that. The investment trends, total factor productivity, exports and investment are presented in Table 1.

The investment of a manufacturing firm is an important aspect of competition. This partly stems from the fact that barriers to entry are considered an important structural characteristic of an industry that can be inferred through investment. Bain's pioneering work (1956) specified three sources of entry barriers: absolute cost advantages of incumbent firms, economies of scale and product-differentiation advantages of incumbent firms, such as reputation and goodwill. Other reasons include the learning experience possessed by the existing firms, consumer loyalty to brands already used, and availability of financing (banks are less eager to lend to new inves-

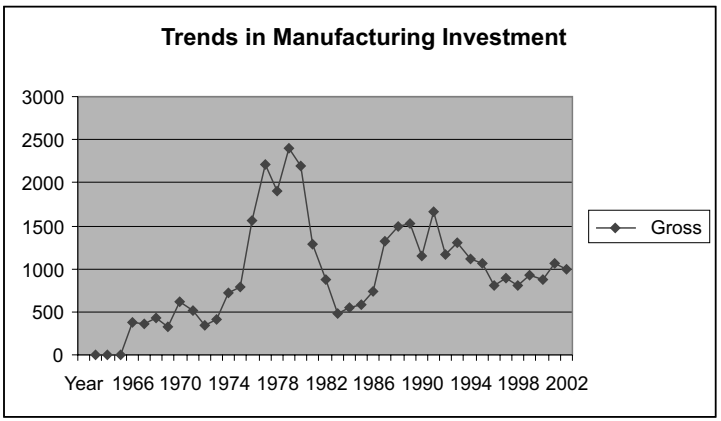
tors) (see also Geroski, Gilbert and Jacquemin, 1990). Whereas there can be many reasons why entry may not occur, the investment performance of an industry is generally assumed to strongly influence the entry conditions. The primary explanation for entry barriers is the existence of entry cost. When the investment costs of establishing a new firm are high, the establishment of new firms will be difficult. To some extent, firms that are already in business, i.e. incumbent firms, can have an incentive to deter entry through creating artificially high investment costs. One aspect of the argument for infant protection was that opening up the domestic market would lead to a decline in local production due to competition from imported finished products. The trends in investment after liberalization and the introduction of competition policy could thus shed light on this issue.

In Figure 1, we present trends in investment in the Tanzanian manufacturing sector, and assess how the introduction of competition policy has influenced its trend. The data are from the aggregate statistics of the Tanzanian manufacturing sector from the 1960s to 2000. The time series trend of the data enables us to divide the data set into the pre-competition and post-competition period. The competition policy variables take the value of 1 in the post-competition policy and 0 for the pre-competition policy era. As we showed earlier, the competition policy in Tanzania did not exist until 1994. We therefore compare the behaviour in sector investment during the time when there was no competition policy with the post-competition policy period.

The estimated investment shown in Figure 1 indicates that investment accumulation increased steadily from 1966 up to 1974. Further, we note that there was substantial growth in investment in the sector from 1974 through 1982. The increases during that period partly reflect the response to rapid import substitution industrialization that Tanzania introduced during the 1970s. It was in this period that the manufacturing sector of Tanzania experienced rapid expansion enhanced by the Import Substitution Industrialization strategy of 1968 and Basic Industrial Strategies (1974). To implement these strategies, a rapid expansion of the manufacturing sector's capacity was pursued. Ndulu and Semboja (1986) indicated that production capacity increased by 77 per cent between 1967 and 1975, and doubled between 1975 and 1981. The declining trend especially after 1979 might be due to the economic crisis marked by a foreign exchange crisis and input constraints. The sector faced high rates of effective protection, an absence of competition and decreasing capacity utilization factors that resulted in decreasing efficiency and increasing costs (Ndulu, 1986). Due to the economic crisis, by 1986 output was at only 30 per cent of its 1979 level, with the share of GDP falling from 12 per cent in the 1970s to 8 percent in the 1980s (Mans, 1994). This was the period when major state-owned monopolistic firms were established. The figure also shows that from the late 1970s to the mid-1980s, investment in the sector fell markedly. This trend coincides with the economic crisis of the early 1980s. The recovery in investment is noticeable, especially from the late 1980s, when Tanzania embarked on major economic restructuring. The trend

in investment from 1994, when competition policy was introduced, indicates that sector investment is relatively higher than the pre-1970s level.

Figure 1. Trends in manufacturing investment.



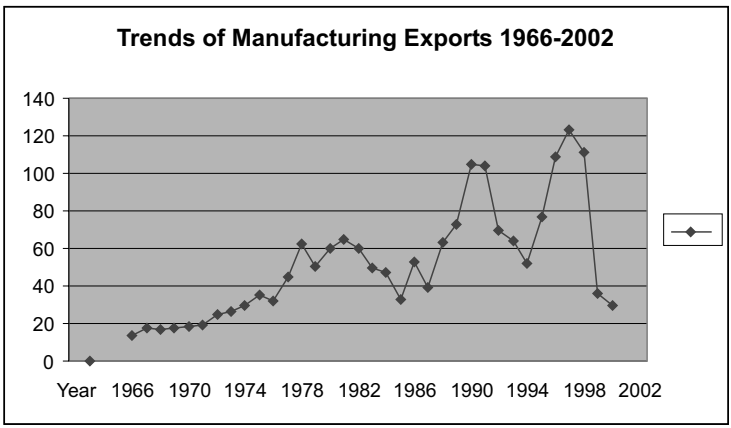
Source: Computed from the Economic Surveys, Statistical Abstracts and National Accounts (various issues).

The estimated total factor productivity (TFP) series of the Tanzanian manufacturing sector is shown in column 1 of Table 1. Based on the results in this first column, the estimates of TFP from 1966 to 1969 were negative and ranged between –12 and –52. The TFP improved from 1969 to 1979, and was positive throughout this period. From 1980 to 1985, total factor productivity fell significantly. Declining trends of total factor productivity associated with increased capital stock can be due to the effect of industrial expansion marked by under-utilization of capacity. The reforms introduced in the 1980s were intended to restore performance in the manufacturing sector through increased capacity utilization, export promotion, attraction of private sector (both foreign and domestic), investment increased competitiveness and overall efficiency (Maliyamkono, 1985). During this period, inefficient companies closed down as the government role in direct production substantially decreased. However, the post-1994 period does not reflect a significant improvement in total factor productivity. Based on such an observation, we have little evidence of the link between total factor productivity and competition policy. However, one limitation of analysis based on these aggregate statistics is the extent to which they can represent the entire sector, as they cover only medium and large enterprises. We will exploit this issue more using firm-level statistics.

In columns 2 and 3 of Table 1, we show the role of manufactured exports over time before and after the introduction of the competition policy. The trend is also displayed in Figure 2. It is apparent that Tanzania's share in the world market is

negligible and has been declining in real terms. One objective of the trade and financial sector liberalization, which has been implemented since the 1980s, is to encourage manufacturing firms to operate in a more competitive environment so as to enhance their efficiency and productivity. There was certainly an expectation that, after the reforms, local firms would hold their market share and increase exports. On the basis of the official statistics there is no basis to believe that this expectation has been met. The other aspect is whether and to what extent the export trend observed here is linked to competition policy. When we consider the early 1990s as the cut-off point for competition, we find that there is no systematic pattern in changes in export and changes in policy. The export figures for example were higher in 1990–1991, fell dramatically between 1991 and 1995, and then peaked in 1996–1998. Further, the exports fell significantly between 1999 and 2001.

Figure 2. Trends of manufacturing exports 1996–2002.



Source: *Computed from the Economic Surveys, Statistical Abstracts and National Accounts (various issues).*

However, the analysis of firm performance presented in this section is limited by the extent to which the aggregate statistics can be representative of the entire sector. The figures reported in all aggregate sources are based on the large and medium-sized firms, hence excluding micro and small firms. Given that firm size can influence firm-specific characteristics, there is a question as to how representative they are of the entire sector. The other limitation of the aggregate statistics of Tanzanian manufacturing is that, prior to 1988, the sector was protected through tariffs, subsidization and other forms of protection. This could lead to over-valuation of the output figures prior to 1988 as reported in official sources. For instance, Bukuku (1993) argued that some manufacturing enterprises were financially profitable ventures only because of high protection of domestic production, but at world prices their contribution was not significant. In this study, we present firm-level statistics that contain information for all firm sizes, i.e. micro, small, medium and large firms from

Table 1. Total factor productivity, investment, export and competition policy in Tanzanian manufacturing.

Year	TFP	Exports (US$)	Log export	Real investment
1966	-52	13	18	382.50
1967	-47	18	19	354.80
1968	-27	17	19	437.00
1969	-12	18	19	323.00
1970	5	19	19	621.40
1971	9	19	19	509.83
1972	26	25	19	335.14
1973	37	26	19	405.00
1974	50	30	19	719.00
1975	40	35	19	785.50
1976	19	32	19	1555.27
1977	54	45	20	2202.50
1978	51	62	20	1906.06
1979	39	50	20	2401.78
1980	0	60	20	2189.17
1981	-20	65	20	1282.21
1982	-22	60	20	877.70
1983	-19	50	20	484.50
1984	-15	47	20	552.55
1985	-10	33	20	588.56
1986	5	53	22	729.13
1987	35	39	22	1319.09
1988	1	63	23	1496.86
1989	30	73	23	1523.88
1990	6	105	24	1152.06
1991	-19	104	24	1658.42
1992	-64	70	24	1161.65
1993	-81	64	24	1295.75
1994	5	52	24	1120.08
1995	1	77	24	1065.79
1996	-1	109	25	813.10
1997	2	123	25	887.62
1998	3	111	25	800.77
1999	-4	36	24	918.69
2000	-2	30	24	866.33
2001	-6	56	25	1058.23
2002	-17	66	25	1002.15

Note: *TFP is total factor productivity. The total factor productivity is directly estimated from the production function. Data on investment are from the Economic Surveys, Statistical Abstracts and National Accounts (various issues). The export figures are in millions of US dollars. The investment data are real values of gross fixed investment deflated using the 1994 CPI =100 and are in millions of Tanzanian shillings. The competition variable is a dummy for whether or not the period was affected by competition policy. Specifically, the dummy is equal to 1 if the year was influenced by competition policy and 0 if otherwise.*

1993 to 2002. This information will be used to compare productivity trends for 1993–2002 based on both firm-level and aggregate-sector statistics. In this study, we use a firm-level data set that contains firms of all sizes, i.e. micro, small, medium and large firms. The data also provide detailed information concerning aspects of firm-level performance, competition and regulations. We will therefore use this information to provide a more rigorous firm-level assessment of the relationship between competition policy and firm performance.

4. Methods and approach for assessing the impact of competition policy on manufacturing performance

In this section, we provide the methodology and approach for assessing the impact of competition policy and competition on firm performance. We also discuss the limitations of the approach and possible solution(s) for such problems. In addition, we discuss ways of tackling estimation problems employed in this study. We also specify the model to be estimated and the data available for our study. The discussion on data includes a description of the type of data used, their source and the creation of variables to be estimated. The empirical approach of this chapter focuses on identifying, describing and measuring variables that link competition policy and firm performance and assessing the impact of the legal and institutional structures of competition policy and the related policies on domestic firm performance. In particular, the methodology used develops measurement criteria that can be tested over time in the same sector or replicated in other countries with similar characteristics. Recently, we have seen an increase in the availability of firm-level micro-data in developing countries, primarily through the regional Programme of Enterprise Development (RPED) surveys organized by the World Bank. This chapter uses an existing data source from Tanzanian manufacturing firm surveys that are part of the RPED surveys. The independent variables in our analysis are variables that proxy for the set of measures and instruments used by government that determine the conditions of competition. In view of the possible overlap between competition policy and competition, the chapter attempts to include some variables that proxy for competition such as the existence of five competitors in the production sector and the condition of competition.

The dependent variables in our estimates are the investment, export and productivity variables. The fact that panel data are used enables us to provide an empirical analysis that controls for unobserved characteristics that affect the measurement of causal effects of competition policy on our firm performance variables. The RPED surveys data used in this chapter collect information on competition from imports, competition from local firms, the effect of government industrial policies on firm performance, the effect of government restrictions on various aspects related to industrial activities, and the way taxation policy affects company performance.

4.1. Estimating the productivity effect of competition

To assess the productivity effect of competition policy on the manufacturing sector, we estimate the production function as follows:

$$Q_t = A_t K^{\beta 1}{}_t \, L_t^{\beta 2} \, COM_t^{\beta 3} \qquad [1]$$

where Q_t is the value of manufacturing output in year t, A_t is an index of total factor productivity or a coefficient that denotes the level of technology, and K_t and L_t are the stocks of physical capital and labour for year t, respectively, and COM is a dummy for competition policy. In order to estimate our production function [1], we introduce log variables that give us the following equation:

$$\text{Log } Q_t = \log A_t + \beta_1 \log K_t + \beta_2 \log L_t + \beta_3 \log C_t + \beta_4 COM_t + \varepsilon \qquad [2]$$

where Q_t is the log of output, $\log K_t$, $\log L_t$ and $\log C_t$ are logs of capital stock, labour and indirect costs, respectively, COM is as defined in equation [1] and e is the error term. Value added production function output is measured as value added hence the dependent variable in equation [2] is the log of value added. The value added production function is specified in equation [3] below.

$$\text{Log } V_t = \log A_t + \beta_1 \log K_t + \beta_2 \log L_t + \varepsilon \qquad [3]$$

However, there are problems in estimating the effect of competition on firm performance productivity, particularly endogeneity, and specification of production function and input measurement. There is a potential simultaneity problem when estimating production function especially when firm usage of inputs is correlated with firm-specific characteristics, e.g. a strategy to adjust for unforeseen upsets during transition. In addition, firm-specific effects are correlated with the competition variables; hence, estimates that do not control for these effects may be biased. In this study, we control for this bias by estimating the differenced production function estimates.

The other estimation problem arises from specification of production function (i.e. whether the value added or gross output production function is specified). The previous studies that have estimated production function argue that the choice between using the gross output or value added production function is important because each specification leads to different results. Basu and Fernald (1997), for example, indicated that estimates of the increasing returns to scale measured by the value added production function do not imply increasing returns to scale in the gross output production function. The problems of estimating gross output production function are also highlighted in Griliches and Klette (1996), who argued that when sales are used instead of output in production function analysis, and if the prices are correlated with included variables in the model, an omitted variable bias will arise. The authors also argued that in the presence of imperfect competition, value added suffers from an omitted variable bias and aggregation bias. Allied with that, the value

added production function, is said to impose weak separability on technology unless the sample used satisfies the condition that the ratio of price of materials to the price of output is constant (Ferguson, 1965). Data availability and the market conditions are therefore important determinants of the choice between the two specifications. To address the weakness of alternative specifications, we estimate production functions that analyse the impact of output on factor productivity and human capital characteristics of learning by comparing the value added with the gross output production functions.

4.2. Estimating the competition and competition policy effects on firm performance

To estimate the possible influence of competition and competition policy on firm performance indicators of investment, exports and productivity, we specify a probability or likelihood model, i.e. a probit function. Such a model is an appropriate tool for fitting a situation with a binary outcome. In our situation, we assume that the presence of competition policy and/or competition *per se* will result in two possible outcomes: (1) enhance firm performance through increased productivity, export and investment, or (2) limit firm performance by eliminating its likelihood to export or invest and reducing its productivity. To investigate the way competition policy and/or competition might have affected firm performance the model groups firms into those that increased performance after the competition policy and/competition was introduced and those that experienced reduced performance after the introduction of competition policy and/or competition. To be able to examine the effect of competition policy on investment and export, we estimate a probit model. The binary outcome is characterized as changes in export/investment due to changes in competition policy. The probit model estimate is defined as follows:

$$Y^*ijt = \beta_0 + \beta_1 X_{ijt} + \delta_{ijt} \qquad [4]$$

where Y*ijt is the unobserved "latent" variable determining the levels of investment and/or firm-level exports of firm j during time t. X_{ijt} is a set of observable determinants of investments and exports. To facilitate our analysis we include the competition variable COM, among the possible determinants of investment and exports. β_i denotes parameter estimates and δ is the disturbance term. Although Y*ijt is not observed, we can observe Y, a dummy variable that we characterized above for binary outcomes.

$$Y^*ijt = 1 \text{ if } Y^*ijt > 0$$
$$0 \text{ otherwise} \qquad [5]$$

4.3. Measuring changes in market power and concentration

In order to investigate changes in market power or concentration, we specify a concentration measure. There are a variety of indices that can be used. Most concentration measures are based on the shares of an individual firm. If we denote the number of firms in the sector as n and q_{it} represents the share of sales of an i^{th} firm at time t, then the sum of q_{it} from 1 to n will be q_t and the share of each firm in the market for a specified time period, say year t, would be expressed as:

$$p_{it} = \frac{q_{it}}{q_t} \quad i = 1,...,n \text{ and } t = 1,...,T \qquad [6]$$

The Concentration Ratio (CR) can be calculated as the total share of firms which have the largest shares in the market. It is denoted by CR(k) and is calculated as:

$$CR(k)_t = \sum_{i=1}^{k} p_{it}, \qquad k < m \qquad [7]$$

In most applications CR(4), CR(8) or CR(16) are used; the selection of k is arbitrary. The other measure is the Hirschman-Herfindahl Index (HH). This measure can be described as the sum of p_{it}s weighted by themselves:

$$HH_t = \sum_{i=1}^{m} p_{it}^2 \qquad [8]$$

The HH index lies between 1/n, where all p_{it} values are equal, and 1, where there is only one p_{it}, implying that $q_{it} = q_t$.

Theoretical support for the HH index is provided by Cowling and Waterson (1976) but many studies use the concentration ratios as they are often supplied by the official statistics. Various authors have argued that for an economy with high concentration, the use of the HH index is more revealing, as the changes taking place at the top end of the size distribution can be obscured by the measures such as CR(4).

5. The effect of competition policy on firm performance

This section analyses the effect of competition policy on firm performance. In particular, we assess the role of competition policy in influencing a firm's propensity to export or invest and its productivity. In the introduction section of this chapter, we

argued that, in order to promote desirable economic performance, competition policy may strategically subject firms to rules that safeguard anti-competitive behaviour, such as collusive tendering and bidding, and price-fixing arrangements. To achieve the intended objectives, competition polices can aim at limiting the economic power of some firms and abuses of the economic and political system. However, there is limited evidence that competition policy will at all times lead to all these advantages. In a study by Brien, Howe and Wright (1979), it was highlighted that clearly there is a belief that competition policy has harmful effects upon the development of firms. The authors further indicate how, in their earlier study, it came to light that competition policy had been responsible for the lack of prosperity of firms; what they called 'the anti-competitive tide', the rise of restrictive practices to protect profit margins in the face of the emergence of mass trade-unionism, which meant that downward wage stickiness will greatly increase in times of recession.

Therefore, the major question that surfaces from implementing competition policy is whether and to what extent is firm-level performance influenced by competition policy? It is anticipated that a well-designed and effective competition policy enhances the international competitiveness of efficient firms and improves the economy in ways such as higher exports, the attraction of new investments, lower imports and more employment. Whether or not this is the case is the subject of empirical investigation in this area. To address this question, we estimate the firm-level production function, the export propensity function and the investment propensity function, in which the proxy for competition policy is one of the variables that determine firm productivity, export and investment. We look at the investment, export and productivity of firms in an attempt to see whether the competition policy has any effect on firm-level performance. In addition to these functions, we compare trends in selected firm-level performance indicators of profit rates, exports, investment and value added of firms that have indeed been affected by the competition policy, before and after the competition measures were introduced.

We begin by presenting the descriptive statistics of the key variables used in our estimations, namely gross output, raw materials, exports, capital stock and the human capital variables of schooling, tenure and work experience. The data show that in 1993 the gross real output was US$ 1,034,332, and increased gradually over the 1990–2000 period. By the year 2000, the gross output had reached US$ 1,887,968. The observed changes are a reflection of substantial reforms in the sector, especially privatization of many stagnant state firms and encouragement of investment in the sector during the period. The substantial rise in gross output is supported by a rise in value added. The figure shows that value added was US$ 392,069 in 1993, but reached US$ 1,498,333 in 2000. It is evident that both net output and gross output have shown an increasing trend during the period.

The other variable presented is export. The trend in this variable shows that export performance has not significantly changed over the entire 1990–2000 period. The average total exports have stagnated at about US$ 4.5 million.

The data show that, prior to the mid-1990s, the average tenure was 7 years, and during the late 1990s and 2000 it increased slightly to about 8 years. In theory, this short tenure cannot be expected to result in significant firm-specific skill acquisition. Therefore, firms might experience less positive gains in productivity due to firm-specific skills. The data also show that between 1993 and 2000, the average years of education of a member of a firm's workforce in our surveyed firm-level data was about 8 years. The results suggest that the majority of the workers have less than secondary school education and very few have post-secondary education, which requires about 16 years of education in total.

Table 3. Regression estimates of the effect of competition policy on manufacturing productivity.

Variables	OLS1	OLS2	OLS3	FEM1	FEM2	FEM3
Dependent	Value added	Investment	Export	Value added	Investment	Export
Com-policy	0.412	0.821	0.133	-0.246	1.410	0.422
	(2.33)**	(2.47)**	(0.53)	(0.62)**	(2.57)**	(1.74)*
Com1		-0.586	-0.291		-2.045	
		(1.00)	(0.81)		(1.44)*	
Log capital	0.349	0.881	0.217	-0.026	1.35	0.005
	(9.63)***	(6.87)***	(3.53)	(0.10)	(6.43)***	(0.03)
Log labour	0.702	0.200	0.142	0.622	-0.567	0.22
	(10.27)***	(0.66)	(1.46)*	(3.18)***	(1.48)	(1.62)*
Log value added			0.774		-0.066	0.373
			(9.34)***		(0.39)	(6.58)***
Job training	-0.789			-0.536		
	(1.61)			(0.43)		
Other training	0.363			-0.011		
	(1.30)			(0.01)		
Experience	0.033			-0.013		
	(2.03)**			(0.89)		
Tenure	-0.021			0.074		
	(1.37)			(2.28)		
Schooling	0.552			0.100		
	(1.65)			(1.73)*		
Constant	3.501	7.30	1.763	7.92	3.63	5.37
	(8.29)**	(7.54)***	(16.78)**	(2.58)**	(2.48)**	(2.63)**
Observations	421	421	421	421	421421	
R-squared	0.73	0.73	0.92	0.30	0.78	0.900
F	74	22	102	4	149	
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Absolute value of t-statistics in parentheses; *significant at 1 per cent level; **significant at 5 per cent level; ***significant at 10 per cent level.

The results reported in the first column of Table 3 are for estimating the effect of competition policy on firm-level productivity. The measure of firm-level productivity or "the dependent variable" is the log of value added. The competition policy variable is measured as a dummy that takes the value of 0 for the period before the competition

policy was introduced and 1 after the competition policy was introduced. The productivity effect of the competition policy variable is estimated directly from the production function. Other determinants of productivity considered in this first column are log of capital stock, log of labour and human capital. The real value added is the deflated value of the difference of total manufactured output minus indirect costs and minus raw materials used in producing the output. The capital stock is a real capital stock series based upon an initial observation of the firm's replacement value of plant and machinery, which is augmented with subsequent investments in plant and machinery made by the firm. The weighted average of schooling, tenure, age and training are derived from firm-level information for each individual concerning the highest level of education completed, the occupational specialization, work tenure and age. Each value is weighted by the proportion of workers in a given occupational category in each firm to obtain a weighted average for each firm.

As shown in Table 3, competition policy is an important determinant of establishment productivity. In particular, it is shown that competition policy has a positive and significant effect on firm-level productivity. The estimated coefficient reported in the first column implies that firm-level productivity in the post-competition policy era is about 50 per cent higher than the productivity effect in the pre-competition policy period. The other results in the first column suggest that capital stock, stock of labour and human capital also influence firm-level productivity.

The results presented in the second column are for testing whether competition policy has any effect on investment in our data. The results are obtained from estimating an investment equation in which competition policy is one of the variables that determine the level of firm-level investment. The other determinants of investment are the stock of capital, firm size (measured by log of labour), firm performance (measured by log of value added) and the general competition environment measured by the situation where competition is one of the three major problems that face a particular firm. The results in the second column are that the implied competition policy coefficient would suggest that investment is higher in the post-competition period than in the pre-competition policy period. The results indicate that firm-level investment in the post-competition policy period is over one-fold higher than firm-level investment prior to the establishment of the competition policy. The other important determinant of firm-level investment according to the results is the stock of capital. It is indicated that a 1 per cent rise in the stock of capital results in a 0.8 per cent increase in investment. Further results indicate that competition *per se* is negatively related to investment. In particular, it is indicated that firms that regard competition as one of the three biggest problems for production have less investment than those that do not regard competition as one of the three production problems.

The third column presents estimates of the export function. As for the other firm performance measures (value added and investment), we include the proxy for competition policy measure among the determinants of exports. The other determinants of exports included in this column are competitive environment, log of capital, log of

labour, and log of value added. The results indicate that there is no significant correlation between competition policy and export. The variables that appear to have strong effect on export are firm size, measured by the log of labour, and the log of value added.

While the results in columns 1–3 highlight the importance of competition policy for firm-level performance, particularly productivity and investment, there are several limitations to these findings. First and foremost is the problem of endogeneity. The presence of unobserved establishment characteristics that are time invariant is likely to bias our estimated coefficients. We mitigate this effect by estimating fixed-effect models of all the three models and report their results in columns 4–6. The results in columns 4–6 indicate that when we control for unobserved firm-specific characteristics, competition policy appears to have significant effects on all firm performance indicators presented in this section (i.e. value added, investment and export performance of a firm). The results suggest that the causal relationship between competition policy and firm performance indicators discussed in this section is not negatively affected by firm-specific characteristics. In fact, there appears to be a positive correlation between firm fixed effects and performance effects of competition policy. In all cases, the estimated coefficient size of competition is substantially increased after the control of firm fixed effects.

Table 4. Summary statistics of firm performance before and after the introduction of competition policy.

Before introduction of competition policy		After introduction of competition policy
Export US$	8,092,303	4,405,767
(SD)	(39,400,000)	(10,100,000)
Value added US$	664,953	710,059
(SD)	(6,260,554)	(5,735,618)
Investment	1,160,672	8,081,651
(SD)	(9,152,969)	(12,300,000)
Profit rate	-0.92	0.809
(SD)	(29.2)	(1.347)

Source: Tanzanian Manufacturing Surveys – part of Regional Enterprise Development Surveys (1994–2001).

Table 4 shows the average total exports, value added, investment and the rate of profit before and after the introduction of competition policy. This sort of presentation allows us to compare the changes in magnitude of the performance variables after the competition policy is introduced. The results indicate that the mean exports after

the introduction of competition policy are half those before the policy was introduced. The other observation is that in both cases, there is high variability in export from the mean (as the standard deviations in both cases are more than twice the mean). But given such an observation, it may be necessary to isolate the effect of competition policy from other possible influences of export performance. As we mentioned in the Introduction, the Tanzanian manufacturing sector has been subjected to a series of reforms particularly privatization. The performance of the sector has not been very satisfactory and in some cases the performance is below the pre-reform levels. A detailed account of the factors behind such performance is beyond the scope of this study, but it is apparent that there are other factors influencing the observed trends in exports.

The other mean displayed in the table is that for value added. The results for this variable indicate that the value added after the introduction of competition policy is higher than the average value added before the competition policy was introduced. Just like the export figures, they appear to have higher variation from the mean (higher standard deviations). The investment figures are much higher in the post-competition policy period than in the pre-competition policy period. Similarly, the profit rates are higher in the post-competition policy period than in the pre-competition policy era. But, as we mentioned above, our results are subject to data problems and other limitations. Despite these limitations, it is evident from the data that there is no evidence that competition policy has adversely affected any of the performance variables described here. In general, competition policy does not appear to have clear adverse effects on firm performance.

6. The empirical estimates of the productivity effects of competition

In this section, we estimate the link between competition and firm performance. In particular, we estimate the gross output and value added production functions in which competition variables are included among the determinants of firm-level productivity. Two measures of competition are available from the survey data. The first is a measure of the existence of competition within the line of production of a firm. This sort of competition is measured by the existence of at least five major competitors. The second measure of competition is based on whether competition is one of the three biggest problems affecting the firm. In this way we are able to differentiate between the effect of the existence of competition and the effect of competition itself.

Table 6. Regression estimates of the effect of competition on manufacturing productivity.

Variables	OLS1	OLS2	OLS3	OLS4
Dependent	Value added	Value added	Gross output	Gross output
com1	-0.350		-0.074	
	(1.73)*		(1.49)	
comf1		0.247	0.041	
		(1.62)	(1.09)	
lkus	0.329	0.343	-0.006	-0.009
	(9.53)***	(9.84)***	(0.59)	(0.86)
ll	0.760	0.750	0.103	0.104
	(11.82)***	(11.67)***	(5.51)***	(5.58)***
lmus		0.549	0.549	
		(29.35)**	(29.37)**	
lous		0.366	0.367	
		(15.96)**	(16.03)**	
onjwgs	-0.676	-0.563	-0.293	-0.312
	(1.38)	(1.14)	(2.37)**	(2.56)**
jotwgs	0.298	0.270	-0.040	-0.036
	(1.13)	(1.02)	(0.61)	(0.56)
pexwgs	0.033	0.029	0.006	0.007
	(2.05)**	(1.75)*	(1.59)*	(1.82)*
tenwgt	-0.015	-0.014	0.004	0.004
	(1.23)	(1.14)	(1.25)	(1.19)
eduwgted	0.008	0.014	0.001	-0.000
	(0.27)	(0.48)	(0.12)	(0.05)
round1	-0.009	-0.001		
	(0.04)	(0.00)		
round2	0.011	0.012	-0.025	-0.023
	(0.05)	(0.05)	(0.53)	(0.49)
round3	0.000	0.000	0.002	0.004
	(0.061)	(0.071)	(0.032)	(0.07)
round5	0.464	0.309	0.067	0.097
	(2.06)**	(1.33)	(1.42)	(2.12)*
round6	0.580	0.432	0.086	0.115
	(2.66)**	(1.91)*	(1.89)*	(2.61)**
round7	0.000	0.000	0.000	0.000
	(0.06)	(0.02)	(0.05)	(0.03)
Constant	3.501	3.319	1.763	1.794
	(8.29)**	(7.91)**	(16.78)**	(17.05)**
Observations	421	421	426	426
R-squared	0.73	0.73	0.98	0.98

*Notes: Absolute value of t-statistics in parentheses; *significant at 5 per cent level; **significant at 1 per cent level. Tzwn, Tanzanian private ownership; statec, state ownership; vadus, value added in US dollars; inplan, investment plan; fmage, firm age; ll, log of labour; lmus, log of raw materials; lous, log of other inputs. Round1 is the year 1993, round2 1994, round3 1995, round5 1997, round6 1998 and round7 1999. The omitted variable is for round8 which is the year 2000.*

The results reported in column 1 indicate that for a firm that ranks competition among the three biggest problems, there is a substantial negative effect of productivity due to competition. In particular, the results show that a competition problem

reduces productivity by 35 per cent. The other results in this column indicate that the estimated coefficient on capital stock is 0.28 and highly significant at the 1 per cent level. It has a positive sign implying that a 1 per cent increase in capital stock will lead to an increase in value added by 0.32 per cent while the labour coefficient is 0.76 and both are significant at the 1 per cent level with a positive sign, implying that a 1 per cent increase in the labour force increases value added by 0.76 percent and a 1 percent rise in capital stock increases productivity by 0.32 percent. The estimated total effect of change in inputs is roughly 1 (summing to 1.08) per cent hence displaying a constant returns to scale.

In column 2, we report the results that models the value added as a function of the existence of competition measured by the existence of at least five competitors. Other production inputs appear in column 2. The results show that the existence of competitors is positively correlated with productivity. Specifically, we find that the existence of at least five competitors is associated with a 24 per cent increase in productivity. These results suggest that there is a positive correlation between productivity and the competition environment, which is consistent with the economic liberalization objectives. Other results are that the estimated coefficient on capital stock is 0.34 and highly significant at the 1 per cent level. It has a positive sign implying that a 1 per cent increase in capital stock will lead to an increase in value added by 0.34 per cent. The labour coefficient is 0.75 and is significant at the 1 per cent level with a positive sign, implying that a 1 per cent increase in labour force increases value added by 0.75 per cent.

But, as previously noted, different specifications of production function lead to estimates that are radically different. We therefore estimate the gross output production function as a supplement to our value added production function estimations. The results in the third column confirm a negative correlation with competition being one of the major production problems facing a firm and productivity. Although the results are weakly statistically significant, they still show that there is a fall in productivity of about 7 per cent for firms that consider competition as a major problem in production. Further, we note that other production inputs such as raw materials, labour and human capital characteristics, such as education, are positively correlated with gross output. In the fourth column, we estimate the gross output production function where the measure of existence of competition is included among the determinants of productivity. The results still confirm a positive correlation between productivity and the existence of competition. However, the estimated coefficient is lower than reported in the second column.

The results presented in Table 6 suggest that the existence of competition and the competition problem comprise one of the major production problems that affect a firm's productivity differently. It is evident that the existence of competition has a positive effect on firm productivity, and when competition is ranked among the three major production problems, a negative effect on firm's productivity is observed. Nonetheless, there are limitations to the OLS approach used in the table, especially re-

garding the failure to address the problem of unobserved characteristics mentioned earlier. To account for this problem, we estimate the differenced production functions that exploit the time variation to difference out the unobserved time-invariant aspects that are the source of this estimation problem. The results are reported in Table 7.

Table 7. Regression estimates of the effect of competition on manufacturing productivity.

Variables	OLS1	OLS2	OLS3	OLS4
Dependent	Value added	Value added	Gross output	Gross output
com1		-0.058		0.023
		(1.39)		(0.15)
comf1	0.135		-0.284	
	(2.49)**		(1.33)	
ddlkus	-0.011	-0.012	0.374	0.377
	(0.92)	(0.96)	(10.67)***	(10.71)***
ddll	0.103	0.101	0.716	0.714
	(5.22)***	(5.07)***	(10.80)***	(10.74)***
ddlmus	0.543	0.544		
	(27.37)***	(27.24)***		
ddlous	0.373	0.375		
	(15.07)***	(15.04)***		
onjwgs	-0.056	-0.084	0.317	0.322
	(0.42)	(0.61)	(0.62)	(0.62)
jotwgs	-0.123	-0.097	0.049	0.070
	(1.76)*	(1.36)	(0.18)	(0.26)
pexwgs	0.006	0.007	0.032	0.031
	(1.45)	(1.48)	(1.88)*	(1.80)*
tenwgt	0.004	0.004	-0.012	-0.012
	(1.11)	(1.05)	(0.91)	(0.89)
eduwgted	-0.014	-0.011	-0.035	-0.029
	(1.74)*	(1.42)	(1.17)	(0.96)
round2	-0.008	-0.006	-0.032	-0.024
	(0.15)	(0.12)	(0.13)	(0.10)
round3	-0.033	-0.042	0.000	0.000
	(0.55)	(0.69)	(0.80)	(0.61)
round5	0.143	0.140	0.715	0.657
	(2.84)***	(2.67)***	(3.01)***	(2.69)***
round6	0.104	0.105	0.598	0.548
	(2.18)**	(2.09)**	(2.60)***	(2.30)**
round7	0.000	0.000	0.000	0.000
	(0.05)	(0.01)	(0.02)	(0.04)
round1		0.268	0.277	
		(1.16)	(1.20)	
Constant	1.946	1.924	3.427	3.333
	(17.11)**	(16.91)**	(7.65)**	(7.48)**
Observations	425	425	420	420
R-squared	0.98	0.98	0.72	0.72

*Absolute value of t-statistics in parentheses; *significant at 5 per cent level; **significant at 1 per cent level. Variables are as defined in Table 5, except that dd refers to a*

differenced variable. Eduwgted is the weighted variable of schooling, tenwgt is the weighted average of tenure, and pextwgt is the weighed average of work experience. Jotwgts is the weighed average of job training attended in the past and onjotwgs is the weighted average of job training attended recently.

The results in the first column suggest that even when we control for firm fixed effects, the impact of the existence of competition on productivity is positive. It is observed that controlling for firm fixed effects, the existence of at least five competitors raises the productivity of a firm by 13 per cent. The results on the other hand are less than those obtained using OLS, suggesting that the OLS results were biased upwards. In the second column, we consider the effect of competition problem on firm productivity once we control for firm fixed effects. The results reveal that there is still a negative correlation between competition problem and firm productivity, although the results are not statically significant. In columns 3 and 4, we estimate the differenced gross output production function. In the third column, a positive correlation between existence of competition and productivity is confirmed. In column 4, a negative correlation between competition problem and firm-level productivity is observed, but the results are not statistically significant.

7. Determinants of competition investment plans and exports

In this section, we examine the effect of competition policy on investment and export behaviour of a firm by assessing the extent to which one variable is a determinant of the other. Specifically we estimate the extent that either of the determinants of investment plan and export behaviour could be affected by competition and *vice versa*. In column 1, we present a probability equation for the existence of competition. The independent variable estimated in this probit equation is for whether a firm has at least five competitors. The determinants of competition existence considered in this equation are firm ownership, productivity (measured as value added), investment plan, export behaviour, firm size and sector. The results show that an increase in value added reduces the existence of competition for a firm. It is also observed that the probability of the firm-level plans to invest increases with the existence of competition. This is consistent with the predictions that competition may induce investment as a tool to maintain production in the face of increased competition. The other results in column 1 indicate that the likelihood of the existence of competition is influenced by sector, firm age and export behaviour. The exporters are less likely to have more competitors than non-exporters. Also, the existence of competition is negatively correlated with firm age implying that old firms are less likely to have more competitors than new ones.

In column 2, we report estimates of a probit equation for estimating the determinants of the competition problem in the surveyed firms. Similar determinants considered in the first column are presented. The value added is negatively related to the competition problem implying that the higher the value added, the less the likelihood of facing competition among the biggest production problems. The results also show

Table 5. Determinants of competition investment plans and exports.

	Competition problem	Competition existence	Export sales	Investment plans
plans				
tzwn	0.058	0.678	-0.041	0.078
	(0.25)	(3.96)***	(0.18)	(0.34)
Statec	0.900	0.251	0.637	
	(2.26)**	(0.50)	(1.17)	
vadus	-0.001	-0.001	0.0001	0.000
	(1.25.)	(2.16)**	(1.61)*	(0.92)
inplan	-0.001	-0.001		
	(1.64)*	(4.51)*		
micro	-0.527	0.154	-1.217	-1.271
	(1.92)	(0.79)	(3.79)***	(3.72)**
small	-0.266	0.093	-0.756	-0.656
	(1.44)	(0.62)	(4.76)***	(4.04)**
medium	-0.50	-0.619	-0.416	-0.334
	(2.07)	(3.13)**	(2.29)**	(1.83)
fmage	0.001	-0.010	-0.014	0.012
	(1.24)	(1.96)*	(2.08)	(2.33)*
exports	-0.983	-0.325		
	(2.72)**	(1.72)*		
comp	-0.621		-0.386	-0.377
	(4.04)***		(2.66)**	(2.35)**
com1			-1.088	-1.12
			(2.90)**	(3.87)**
comf1			-0.144	1.551
			(0.85)	(9.22)
lkus				-0.201
				(2.89)**
ll				0.013
				(0.12)
lmus				-0.037
				(0.37)
lous				0.181
				(1.32)
Chi2	53.1	131	70.86	156
Pseudo R^2	0.2199	0.17	0.135	0.314
Prob > chi^2	0.0000	0.000	0.000	0.000
Log likelihood	-177	-318	-227	-169
Observations	648	648	648	648

*Absolute value of z-statistics in parentheses; *significant at 5 per cent level; **significant at 1 per cent level.*

a negative relationship between the possibility of mentioning competition among the three biggest production problems and the investment plans. This suggests that firms that rank competition among the top production problems are less likely to invest in the future. Further, we observe that competition problems are more common to smaller firms than large firms, non-exporters than exporters, and are sector specific. In particular, we find that the likelihood of ranking competition among the three biggest production problems is higher in the textile sector than in the wood sector. In columns 3 and 4, we present the probability models for estimating the determinants of investment plans and exports. In both estimates, competition variables are included among the determinants of investment plans and exports. The results in column 3 indicate that the likelihood of investing in the future is positively related to the existence of competition, but negatively correlated to the competition problem. In the fourth column, we do not find significant correlation between the likelihood of export and competition.

8. Market power concentration and competition policy in the Tanzanian manufacturing sector

This section reviews the implementation of Tanzanian Competition Law. The enactment of the law and the establishment of the Competition Authority have largely been due to Tanzania's obligation under regional and international agreements along with the comprehensive economic reforms adopted in the mid-1980s. After a prolonged period of economic problems especially in the first half of the 1980s, Tanzania embarked on a course of market-oriented reforms at the end of the second half of the 1980s. Reform of the trade regime stood at the core of the reform programme. This involved commitment to a more flexible exchange rate policy and abandoning of import substitution policies through promotion of exports as well as liberalization of imports. Another main objective of the 1980s reform was privatization of state-owned enterprises and liberalization of financial markets. The reforms brought about profound changes in the incentive structure economic actors faced and in the way they did business. This was the case especially for the Tanzanian manufacturing industry, which had to go through a fundamental reorientation after decades of protection under import substitution policies. Cushioned by import restrictions and high tariff barriers, many sectors of the manufacturing industry had been highly concentrated, and state-owned enterprises had dominated many important sectors. Export promotion policies created a new set of incentives for the manufacturing industry.

We first assess the trends in market power or concentration after the reforms and provide some cases illustrating to what extent competition policy has been a key influence on the observed trends. The market power considered here is the degree to which a firm exercises influence over price and output. When firms have market power, they can use this power to raise the price above the going rate. The degree of dominance in market share is one form of market power acquisition. When the sales of a firm as a proportion of the product traded in the market form a significant portion of sales, a firm will then have market power. The reform measures aimed at chang-

ing the market structure, in particular the nature of competition and pricing. Specifically, we discuss the trends in concentration estimated from the survey data.

Table 8. Measures of concentration of the manufacturing firms from Tanzanian manufacturing surveys (1993–2001).

Year	1993	1994	1996	1998	1999	2000	2001
Firm1	0.29	0.34	0.41	0.50	0.49	0.45	0.41
Firm2	0.28	0.23	0.06	0.07	0.07	0.06	0.06
Firm3	0.06	0.06	0.05	0.06	0.06	0.06	0.05
Firm4	0.05	0.06	0.01	0.02	0.01	0.02	0.02
Firm5	0.03	0.05	0.01	0.01	0.01	0.01	0.01
Others	0.29	0.26	0.46	0.34	0.36	0.40	
Concentration Ratio:							
CR3	0.63	0.63	0.52	0.63	0.62	0.57	0.52
CR4	0.68	0.69	0.53	0.65	0.63	0.59	0.54
CR5	0.71	0.74	0.54	0.66	0.64	0.60	0.55
Herfindahl	0.24	0.38	0.47	0.37	0.37	0.38	
1/H	3.84	4.16	2.63	2.13	2.70	2.70	2.63

Source: Computed using firm survey data from the Tanzanian manufacturing surveys (1993–2001).

Table 8 gives average concentrations for all manufacturing industries that are included in the Tanzanian manufacturing surveys over the period 1993–2001. The concentration ratio that concerns us here is the ratio that shows the degree to which an industry is dominated by a small number of large firms or is made up of many small firms. This ratio is calculated based on the concentration ratios specified in section 3. The concentration ratios CR3, CR4 and CR5, as well as the HH index are reported. The firm share is measured in terms of their contribution to sales during the year of survey. In view of the fact that the competition law in Tanzania was introduced in 1994, the year 1993 represents the pre-competition policy era. Based on the concentration results reported in Table 8, the concentration ratios of CR3, CR4 and CR5 reveal that a reduction in concentration occurred after 1993. This is the period when the manufacturing sector went through restructuring and privatization phases and in which privately owned firms entered the market. However, the decrease in concentration appears to be moderate over the period. The decline in concentration ratio indices is notable in firms that are not among the top three dominants. In fact, the concentration of the largest firm remains higher and well above its 1993 level. The

concentration behaviour of the largest firm partly influences the trends in concentration ratios presented in the table. For instance, a substantial fall in concentration of firm2 in 1996 was obscured by an accompanied significant rise in concentration of the largest firm, firm1.

One would have expected that the more liberal import policies and the export orientation of the 1980s would also transform the structure of the Tanzanian manufacturing industry and lead to less market concentration. One objective of the economic liberalization was to reduce monopolization. However, the evidence available on the evolution of market concentration in Tanzanian manufacturing industries since 1993 presented in Table 8 point to the persistence of monopolization and high concentration in some specific activities of the Tanzanian manufacturing industry during the post-reform era. The experience from previous studies in this area shows that cement production, cigarettes, beer and textiles are good examples of where a few large firms dominate the market share in Tanzania.

Given the persistence of high concentration ratios in the manufacturing industry, the importance of instituting and implementing antitrust mechanisms in Tanzania becomes more apparent. The absence of well-articulated competition policy and law would create a breeding ground for all sorts of anti-competitive practices. In 1994, Tanzania adopted the Fair Trade Practices Act (1994) which exhaustively prescribes rules for the protection of the interests of consumers. The law prohibits misleading or deceptive conduct. It requires that in determining whether a person has contravened the law, the Commissioner may have regard to the strength of the bargaining positions of the parties, the validity of conditions, the consumer's understanding of the documents and the circumstances (e.g. use of force or unfair tactics). In addition to other unfair practices, the Fair Trade Practices Act prohibits misrepresentations, misleading advertising and conduct, bait supply, harassment and coercion.

The requirement to comply with prescribed consumer product safety standards and the requirements of the Act relating to consumer protection are obligatory on penalty of prescribed fines and/or imprisonment. Fines imposed are stated in the Act. Some recent cases are summarized in Table 9 below. There is clear evidence of the anti-competitive practice of the monopolistic companies as well as of less concentrated ones. However, as it is noted, most of the cases are based on narrowly defined competition parameters. Institutional, legal and human resource constraints are among the factors behind the limited enforcement of competition law in Tanzania (ESRF, 2002).

9. Summary conclusion and policy recommendations

In this chapter, we set out to answer the question: to what extent firm-level performance measured by investment, productivity and export are influenced by government measures aiming to stimulate competition and protect consumers against monopolization? Our empirical results in this chapter do not indicate that firm performance has been adversely affected by competition policy. On the contrary, we find a

Table 9. Cases dealt with by the Trade Practices Commissioner.

Year	Parties involved	Bone of contention	Action/Decision
8/6/1998	Cooper and Lybrand and Waterhouse	Request for merger approval of two multi-nationals; accounts and business consulting firms	Request granted on 27/6/98
13/8/1998	Trade Practices Commissioner *vs.* Tanzania Communication Commission	Query on allowing Mobile and Tritel (cell phone companies) dominance in the economy. Letter MITC/E.10/45 of 13/8/1998	Other cell phone providers were registered, e.g. Vodafone in 2000
August 1998	Permanent Secretary Ministry of Industry and Trade *vs.* Associated Breweries (Tanzania) Ltd.	False advertisement and unfair representation complaint that Associated Breweries advertisement of "Guaranteeing no hangover" from their alcoholic beer "no sugar added" were false and misleading especially the latter to diabetics	The use of such an advertisement was barred.
22/9/1998	Kibo Breweries *vs.* Tanzania Breweries Limited	Tanzania Breweries with a monopolistic market share in Tanzania of over 80 per cent was barring independent agents, mini-wholesalers from stocking competitors' beer brands and threatening to punish by not selling beers to those who did not obey, on similar terms with those who obeyed	The regulations on how to carry out the Act are not in place, and therefore no case/mandate has been decided upon.
5/5/1999	Urafiki Textile Mills *vs.* Karibu Textile Mills	Urafiki Textile Mills complained against Karibu Textile Mills about fast copying machines which copy Urafiki designs and sell them at a lower price than the original prints by Urafiki Textile Mills.	Regarded as a copyright issue, which should be dealt with by the Commercial Court in the High Court.

5/6/1999	United Lumber and Forest Products Co. Ltd. *vs.* Sao Hill Timber Ltd.	The Government of Tanzania had leased a previously run Parastatal to a Norwegian firm at terms below the normal commercial rates, and also it appeared that the Norwegian Company was subsidizing the operations of this firm. Both dispensations were enabling Sao Hill Timber Ltd. to outbid all others on tenders and price offers.	The government is conducting an outright sale through open tender instead of leasing. The tender is out but it took a long time.
1/6/1999	Ministry of Industry and Trade *vs.* Bonite Bottlers Ltd.	Bonite Bottler bottles drinking water under the Kilimanjaro brand. In their advertisement, they claimed the water to be bottled from a "Natural Spring" when actually the water was from a deep well, purified and then bottled.	The advertisement was changed to "Pure Drinking Water" with neither an argument nor a notification of compliance.
Recent Case1	Coca-Cola *vs.* Pepsi-Cola	Coca-Cola provides refrigerators and chairs to suppliers and restricts them from selling other products such as Pepsi-Cola.	
Recent Case2	Traders of Imported Wine *vs.* TBL	TBL restrict sellers of its products from selling imported beer.	

Source: ESRF, 2003, Wanga (2001) and interview with Trade Practices Commission, Ministry of Trade and Industry 2001.

positive relationship between competition policy and productivity, investment and export performances. For the export and investment performances, the results are stable even when we consider unobserved firm-specific attributes. Regarding the productivity effect of competition policy, the results are influenced by firm-specific attributes suggesting that the positive relationship between competition policy and firm productivity is highly dependent on firm-specific characteristics. But we certainly have evidence that if competition is one of the three major problems facing an enterprise, the enterprise-level performance measured by the productivity will be seriously impaired. This, therefore, calls for some sort of intervention through such measures as competition policy, to minimize the adverse effect of competition. The analysis of aggregate manufacturing sector statistics undertaken in this chapter does not show any clear evidence that sector performance measured by export and invest-

ment has been affected adversely by competition policy – indeed all these variables at some point have shown an up-and-down trend. We have evidence of high concentration in Tanzanian manufacturing and the existence of anti-competitive behaviour, which have been reported to the fair competition department. It is true that the policy may have affected the specific firms that were reported to the commission. However, based on the information about the investment and export behaviour of some of the firms, we find no major effect, and our data do not provide support for the view that anti-competitive behaviour, e.g. through false advertisement, is helpful to their performance. In fact, such companies have retained their position and some have had their performance improved even after being dealt with by the competition laws.

The other important task of the study has been to address the question: what are the prerequisites for the successful implementation of competition policy in developing countries and the mechanism through which this may operate? This study points out that policy makers in developing countries face the challenging task of designing appropriate competition policies that will bring about economic development in these countries. In the light of the previous discussion, such a policy must at least be able to (a) restrain anti-competitive behaviour by domestic privatized large firms, (b) limit abuses of monopoly power by mega-corporations created by the international merger movement, and (c) promote development. There are several characteristics in developing countries that certainly can make the task of competition policy design difficult. For instance, while market entry and access are the key elements of the market economies that many developing countries are currently striving to achieve, in practice, promoting the conditions for wider market access and efficiency through competition has been a difficult challenge. In most developing countries, the market or invisible hand does not always operate very smoothly and indeed the instances of market failures are rather frequent. A clear understanding of the sources of the market failure is crucial for developing an effective competition policy for developing countries. The theoretical explanation for market failure in developing countries is that the high transaction costs and asymmetric information in these countries limit the occurrence of some transactions which would occur for the sake of economic efficiency. The other limits to competition policy design in developing countries are the existence of large informal activities, lack of well-defined property rights, limited environmental, safety and health standards, underdeveloped consumer protection institutions and laws, limited capability to verify and check standards, lack of technical expertise and experience in competition policy and limited institutional capability in areas of competition and antitrust.

While the optimal competition policy will differ between countries depending on their stage of development and the effectiveness of their governments, as well as the supporting institutional framework, there are some prerequisites for the successful implementation of competition policy in developing countries that can be uniformly relevant. First, a country implementing a competition policy needs an enforcement agency with properly trained employees and adequate resources to enforce the policy.

This, thus, calls for the developing countries to maintain a well-organized and efficient institutional framework with adequate human, technical and financial resources. Connected to this point, the institution(s) in charge of competition policy should be politically independent, and transparent to avoid pressure from possible conflict of interest and acts such as corruption. It has also been the case that some countries have developed competition policies in parallel with other existing public policies. But a well-functioning competition policy needs to be linked with other rules and regulations in the economy. In this case, the design of competition policy must be accompanied by efforts to ensure that there is a sound competitive environment in other economic sectors, and policies that are directly or indirectly linked to competition policy. A related point is that competition policy should look beyond the domestic situation. There should be harmonization of the competition policy with those of countries with similar characteristics,

The proper enforcement of competition policy requires knowledge about competition policy, and the capacity to investigate and interpret cases related to competition. Developing countries should, therefore, improve the system of data collection and reporting on competition matters, e.g. concentration, change in market power, investment behaviour of the producing firms, and other possible measures of competition, and encourage and facilitate training in disciplines necessary for the competition policy implementation such as competition law, and economics which has a strong emphasis on aspects of competition and the related fields. But given limited financial and technical capabilities, many developing countries left on their own can hardly afford to establish new institutions equipped with the required expertise and to institute a well-functioning competition policy. There needs to be technical and financial assistance to assist developing countries in the design of optimal competition

To sum up, the prerequisites for the successful implementation of competition policy in developing countries are: a sound competitive environment in other economic sectors and policies that are directly or indirectly linked to competition policy; establishment of production standards; defined property rights; consumer protection agencies; an organized and efficient institutional framework with adequate human, technical and financial resources; harmonization of competition policy with those of countries with similar characteristics and/or economic partners; establishment of procedures and methods that allow the monitoring of competition; ensuring that competition is legally protected and the provision of settlement procedures for disputes through appropriate institutions with adequate knowledge of competition matters; improving the system of data collection and reporting on competition matters, e.g. changes in industrial concentration, changes in market power, investment behaviour of the producing firms and other possible measures of competition; encouragement and facilitation of training in disciplines necessary for competition policy implementation such as competition law, and economics with a strong emphasis on aspects of competition and its related fields.

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IV.3. PRIVATIZATION, COMPETITION POLICY, ECONOMIC DEREGULATION AND THEIR IMPACT ON COMPETITIVENESS: THE CASE OF THE ELECTRIC POWER MARKET IN PERU

Gonzalo Ruíz[1]

1. Introduction

After a decade of increasing fiscal problems and macroeconomic instability, the Peruvian Government initiated a broad set of economic reforms. Among these, the reforms in infrastructural industries, especially in the telecommunications and energy sectors, were particularly important in terms of their scope and economic impact. In the electrical power sector, consistent with widespread structural reform around the world, the reform emphasized three aspects: private participation, industry restructuring and competition promotion. On the one hand, the government promoted a broad privatization program, the vertical and horizontal divestiture of previous state monopolies, and a combination of regulatory schemes and competition mechanisms. On the other hand, however, the government created an institutional framework aimed at minimizing the lack of credibility generated by Peru's weak institutional framework.

Under the new institutional setting for reform in the electricity sector, different roles were defined for public institutions. The main normative tasks were assigned to the Energy Ministry (MEM[2]) and the competition policy task to the competition agency (Indecopi[3]), the supervision and administration of tariff regulatory schemes and quality to the energy regulatory agency (initially the Electric Tariffs Commission and later Osinerg[4]), and the privatization process to the privatization agency (initially COPRI and later ProInversion).

In this context, the reform established at least three dynamic transmission channels to economic competitiveness: the design of a credible institutional framework and, consequently, the promotion of private investment at a lower capital cost, the ability to adequately manage the cost-based regulatory schemes (with some incentive components), and the ability to promote competition among generators on the supply side and among the unregulated big customers on the demand side.

One main question regarding the above is the overall effect of the electricity industry reform on the competitiveness of the economy. The economic literature shows that competition policy is a key factor in price convergence, which is better obtained in economies where competition policies have been successfully applied.[5]

During the 1990s, some developed countries implemented new regulations in the electricity sector in order to stimulate competition in activities that do not possess the technological characteristics of a natural monopoly. There is strong evidence that the general results of these attempts to introduce competition have been positive in terms of lower prices and use of capacity in generation. Indeed, Steiner (2000) has shown, for a sample of 19 OECD countries over the 1986–1996 period, that unbundling

generation and transmission activities, promotion of access to the grid and the introduction of electricity markets have reduced both industrial end-user electricity prices and the ratio of industrial to residential prices.[6] Additionally, Steiner (2000) shows that the reforms in these countries contributed to improve reserve margins and utilization of capacity in the electricity generation market. This general conclusion is also supported by specific country studies.[7]

Compared with the literature regarding reform and promotion of competition in the electricity sector, research about the impact of performance in the electricity market on the competitiveness of other economic sectors of the economy is relatively scarce. However, recent studies applied to Latin American countries have shown that reforms in utilities had a positive impact on welfare and competitiveness. UADE (2003), for example, using a general equilibrium model for Argentina, demonstrated that reforms in electric energy among other services[8] implemented in this country had a positive impact on consumers, on GDP and on exports.

In the case of Peru, an empirical evaluation on the effects of reforms in utilities on the competitiveness of other economic sectors is certainly lacking. In this chapter, we estimate the effects of competition policy on economy competitiveness. Our research strategy is to estimate a supply function for a number of industries, using an input-output matrix in order to quantify the effects of changes in prices of electric power on the prices of other industries, including those which produce tradable and non-tradable goods and services.

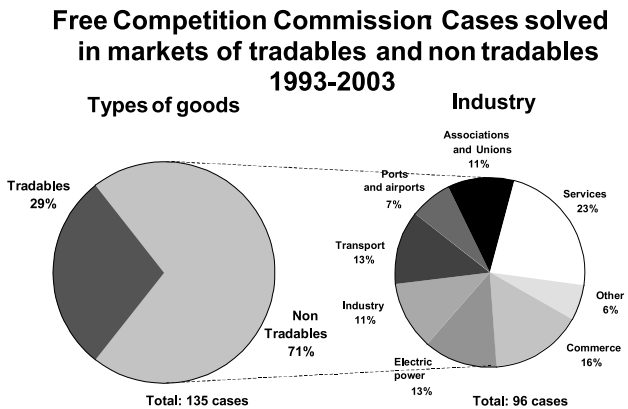
The chapter is divided into six sections. The first section describes the process of reforms introduced in the electric power market in Peru, since 1994. The second section introduces the discussion about the effects of competition in the markets of non-tradable inputs on the competitiveness of the economy and illustrates this relationship in the context of a simple model. The third section presents the general methodology for assessing the impact of increased competition in a non-tradable input on the competitiveness of the economy. The fourth section explains the results obtained by the estimation. Finally, this chapter includes some final remarks with comments on possible extensions to other markets and countries and the complementary roles played by the competition agency, the sectoral regulator and the privatization agency in the case of Peru.

2. The process of reforms in Peru and the deregulation and promotion of competition in the electricity sector

One of the main effects of the foreign trade reform implemented in Peru during the last decade was the increase of competition in domestic markets through the reduction of entry barriers (especially tariff and non-tariff measures[9]) to such markets. This process led to a substantial change in domestic markets structure and the delimitation of domestic markets. As a result, some goods or services, which were considered as non-tradables[10] before the reforms, began to face strong competition from imported goods and services.

Despite the above-mentioned reforms, the technological characteristics of some economic activities, or the nature of certain goods and services, still remain factors that limit the entry to domestic markets. This situation may be one of the reasons why a higher proportion of cases solved by the competition authorities in transition economies refer to non-tradable goods or services. Indeed, Figure 1 shows that in Peru, during the last decade, the proportion of cases solved by the Free Competition Commission in markets of non-tradables was 71 per cent of the total. This reflects the importance of enforcement activities in such markets, as part of the competition policy agenda.

Figure 1. Free Competition Commission: cases solved in markets of tradables and non-tradables (1993–2003).



Source: Free Competition Commission, Indecopi.

In the case of the electricity sector, which represented 13 per cent of the cases solved by the Free Competition Commission mentioned above, since 1992, the Peruvian Government initiated a process of reform in the electric power market. Between 1972 and 1992, the electricity sector had been managed exclusively by Electroperu, a state-owned enterprise which integrated vertically the generation, transmission and distribution activities.

Consistent with the widespread international experience, in the case of Peru, one of the key objectives of the reform was to introduce competition in potentially competitive markets and to ensure the access of competitors to transmission and distribution networks. In order to achieve these objectives, in 1992, through the

Concessions Law in Electricity,[11] the Government proposed the splitting up of the industry into four activities: generation, transmission, distribution and energy trading.

As mentioned above, the decision and strategy of privatization was in the charge of the Commission for the Promotion of Private Investment (COPRI).[12] In the case of the electric energy sector, the privatization process was initiated in 1994, with the auction of 60 per cent of shares from Edelnor and Edelsur, the two electricity distribution firms located in the north and south of Lima, respectively. In 1995, two generation firms (Cahua and Edegel) and another distribution company (Edechancay) were privatized. The process continued during 1996 and 1997, with the transfer of Etevensa and Eepsa, two generation companies, and other distribution firms, located in the north of the country.[13] During 2001, the transmission net was transferred by concession (see Table 1).

Since 2001, the privatization process in the electric energy sector has stagnated. Thus, one of the most important generation companies (Electroperú) still remains in the ownership of the state. However, the general balance of the privatization process is positive: privatization not only allowed new investments to be attracted to the sector (which, only considering the amount obtained through sales, equalled US$ 1.6 billion between 1994 and 2001) but also increased competition in generation, through the entry of new private players into the market.

Table 1. Privatization in the electric energy sector.

Privatization in Electric Energy Sector

Closing date 1/	Firm	Buyer/concessioner	Amount (US$ thousand)
18-Ago-94	Edelnor	Inversiones Distrilima	176,490
18-Ago-94	Luz del Sur	Ontario Quinta	212,100
30-May-95	Cahua	Sipesa	41,810
30-Nov-95	Edegel	Generandes	524,400
15-Dic-95	EdeChancay	Inversiones Distrilima	10,360
22-Ene-96	Etevensa	Consorcio Generalima	
09-Ago-96	Egenor	Inversiones Dominion	228,200
27-Jun-95	EdeCañete	Luz del Sur	8,620
20-Nov-96	EEPSA	Consorcio Elect. Cabo Blanco	19,660
25-Mar-97	Electro Sur Medio	Consorcio Hica Inversiones	25,640
15-Ene-98	TransMantaro	Hydro Quebec - G y M	Concesión
22-Dic-98	Electro Norte	Grupo Gloria (JORBSA)	22,120
	Electro Nor Oeste		22,890
	Electro Centro		32,690
	Hidrandina		67,880
29-Ene-99	Redesur	Red Eléctrica de España	Concession
26-Abr-01	BOOT LL.TT. Oroya-Carhuamayo-Paragsha-Derivación Antamina y Aguaytia- Pucallpa	Interconex . Eléctrica ISA	Concession
11-Dic-01	Electro Andes	Inversiones Elegia S.R.L 2/	226,360
TOTAL			1,619,220

Note:

1/ Closing date: Date of subsciption of the contract.

2/ PSEG Global INC was declared winer of the Public International Contest PRI-64-2001. However, PSEG Global INC transfer its rights to Inversiones Elegia S.R.L.

~~Source~~

Osinerg: Reporte de Privatización

http://www.osinerg.org.pe/osinerg/privatizacion/post_privatiza.jsp

Fuente: Osinerg (www.osinerg.org.pe), Proinversión

As mentioned above, regulatory functions in the electricity market were assigned to the Electric Tariff Commission (CTE), an institution that years later (1996) was incorporated into Osinerg. Osinerg has the role of setting prices in regulated markets, based on the marginal cost of energy production (generation) and the value added of distribution (VAD). The Concessions Law in Electricity also established the functions of the System's Economic Operations Committee (COES), which is composed of all the generators in the system. One of the main functions of COES is to determine the order of dispatch of generation plants taking into account the respective marginal cost of energy production.

Table Nº2 Free Competition Commission: Merger Authorizations

Year of Notification	Authorization Request	Type of Transaction	Date of Resolution	Number of Resolution Free Competition Commission	Decission First Instance	Decission Second Instance
1998	ETECEN - Constitución del Consorcio Transmantaro	Merger	26/02/98	002-98-INDECOPI-CLC	Out of scope of the Law	-
1998	Generandes Perú S.A - Compañía Electrica Cono Sur S.A.	Buy of Shares	23/12/98	015-98-INDECOPI-CLC	Out of scope of the Law	-
1999	Endesa (España) - Enersis (Chile)	Buy of Shares	03/12/99	012-99-INDECOPI/CLC	Authorization subject to conditions	-
1999	Enersis S.A. - Endesa Chile	Buy of Shares	03/12/99	012-99-INDECOPI/CLC	Authorization subject to conditions	-
2001	Tractebel - Electroandes	Previous request of authorization	22/10/01	030-2001-INDECOPI/CLC	Authorization without conditions	-
2001	Tractebel - PSEG Global Inc.	Previous request of authorization	22/10/01	031-2001-INDECOPI/CLC	Authorization without conditions	Confirm
2002	Interconexión Eléctrica ISA - ETECEN ETESUR	Previous request of authorization	29/08/02	016-2002-INDECOPI/CLC	Authorization without conditions	-
2002	Tractebel - EGASA EGESUR	Previous request of authorization	07/11/02	020-2002-INDECOPI/CLC	Authorization without conditions	-
2002	Electroandes-Yuncán	Previous request of authorization	04/12/02	N°022-2002-INDECOPI/CLC	Not funded	-

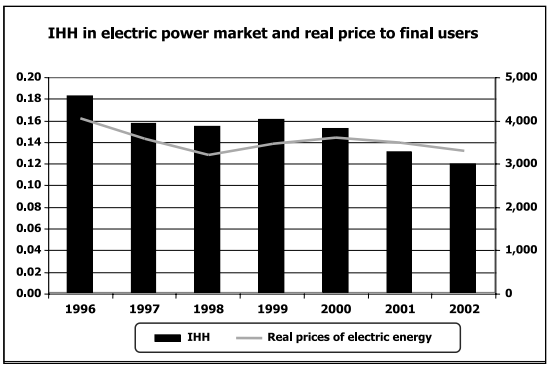
Source: Free Competition Commission, Indecopi

Regarding competition policy, in September 1997, Law 26876 was enacted which established a merger review system in the electric power sector. According to this Law, any concentration transaction made by companies whose market share exceed 15 per cent, in the case of horizontal mergers, or 5 per cent, in the case of vertical mergers, must be notified to Indecopi. Indecopi's role in this procedure is to evaluate the impact of the transaction on competition conditions in relevant markets and to decide either the approval, conditioning, or prohibition of the operation. From

November 1997[14] to December 2002, only nine authorization requests were approved by Indecopi (Table 2). In almost all cases, the transactions were authorized without conditions. There were only two cases in which the authorization was subject to conditions.[15]

Despite the fact that no operation was prohibited since the start of this merger review system, the concentration indexes in the electric power markets have declined. Indeed, Figure 2 shows that the Hirschman–Herfindhal Index (IHH) in the electric power generation market declined by 25 per cent between 1997 and 2002.[16]

Figure 2. IHH in the electric power market and the real price to end-users.



Source: Osinerg

The competition analysis in the Peruvian electric power market includes at least three relevant markets. The first one is the market of non-regulated users, which includes clients whose energy consumption exceeds 1 MW. Prices in this market are not regulated. A second market is composed of regulated users and includes transactions between generators and distributors or distributors and regulated clients. In both cases, prices are regulated by Osinerg. A third relevant market includes spot transfers of energy and power between generators. This market is governed by regulatory rules that establish the merit order dispatch to supply energy.[17] In this spot market, prices are set by COES, which is composed of all the generators, according to the parameters established by the Concessions Law in Electricity.

Figure 2 shows the evolution of average annual real prices of energy to end-users during the 1996–2002 period. The cumulative reduction of these prices during the period has been 18.2 per cent.

Other performance indicators of the industry show significant improvements during the period.[18] For example, regarding the quality of the service, in 1993 total energy losses of distributors was 22 per cent of the total amount of energy received by distribution systems. This percentage declined to 9.1 per cent in 2002. The coverage

of the electricity system increased substantially, which has been reflected in the increase in the number of users. While in 1994 the number of users was of the order of 2,309 thousands, in 2002 it was 3,621 thousands.[19] Moreover, as a consequence of a broad program of electrification implemented during the period,[20] per capita electrification coefficients were reduced from 52.3 per cent (one of the lowest in Latin America) to around 75 per cent in 2000.[21]

Given the results outlined above, the overall balance of the reform implemented in the Peruvian electricity market during the 1994–2002 period is positive. Even though levels of concentration in generation in absolute terms still remain relatively high, prices have been reduced, and quality and coverage have been improved. In contrast with the deficit in generation capacity faced in the early 1990s, nowadays the system exhibits excess capacity as a consequence of the increase of new investments in the sector.

Even though is not our intention to undertake an exhaustive analysis of the reform, the figures and indicators shown above, give us a general overview of the most important results of this process.[22] In the next section, we will address the methodology for measuring the impact of one of the variables analysed above (real prices) on the competitiveness of the economy.

3. A simple model of fixed coefficients for a small economy

Promoting competition in markets of non-tradables may have positive effects from the perspective of both final and intermediate consumers. From the final consumer perspective, reducing market power in those markets will be reflected not only in lower prices of these goods but also in lower prices of other goods and services which are included in its consumption basket (which uses the non-tradable product as an input).

From the intermediate consumer perspective, a reduction in market power in the non-tradable market could also have direct and indirect effects on its competitiveness. The direct effect is related to the reduction of the price of the non-tradable input itself and the indirect effect to the reduction of the price of other inputs which also consume the non-tradable good.

These effects could be easily illustrated through a simple model. Let's assume an economy in which the production vector includes a non-tradable product (N) and other products (Y).[23] These products are used in turn as an input for producing N and Y. Accordingly, a fraction of Y is used as an input for producing the same good (Y_Y) and the other fraction for producing N (Y_N). The same assumptions could be made for the non-tradable good (N):

We can express (1) as the sum of the technical coefficients associated with the production of Y and N:

$$a_{YN} + a_{YY} = 1$$

(1')

$$a_{NN} + a_{NY} = 1$$

In (1') the coefficient a_{ij} is the technical coefficient corresponding to the input i used for producing output j. Let's consider a Leontief technology so that these technical coefficients may be assumed to be constant. Additionally, if we assume that the production function exhibits constant scale returns, we can express the production of Y and N as follows:

$$Y = PMgY \; Y_Y + PMgN \; N_Y$$

(2)

$$N = PMgN \; N_N + PMgY \; Y_Y$$

where PMg indicates the marginal productivity of each input. If there is equilibrium in the market of inputs, the real price of any input must equal its marginal productivity. Therefore, replacing in (2) the technical coefficients defined in (1') and the equilibrium condition in input markets we get:

$$P = P \; a_{YY} + w_n \; a_{NY}$$

(3)

$$w_N = P a_{YN} + w_N \; a_{NN}$$

The system of equations described in (3), where P is the price of Y, could be used to assess the impact of a change in prices of the non-tradable input (w_N) on P. In order to include in this evaluation both direct and indirect effects of changes in w_N, we must solve the second equation of (3) for P and replace the solution in the first equation. Then we get that any change in w_N has the following impact on P:

$$(4) \quad \Delta P = \left[\frac{a_{YY}}{a_{YN}} + 1 \right] a_{NY} \, \Delta w_N$$

where the first part in parentheses reflects the indirect effect of a change on the price of the non-tradable input, while the second indicates the direct effect (which only depends on technical coefficient a_{NY}). Notice that the lower the fraction of input Y used to produce N (and therefore the higher the proportion of this input used to produce Y), the higher is the indirect effect of a change in price in non-tradables.

According to this simple model, the impact of a change in non-tradable input could have multiplicative effects on the prices of other products in the economy, especially when such products consume a significant proportion of inputs from other sectors of the economy (which is related to a_{YY}). This multiplicative effect is associated with the indirect effects of reduction of prices on the non-tradable inputs on other sectors.

It is important to stress that a price reduction in the non-tradable input will not always be a consequence of the improvement in competition in that market. Indeed, a reduction in prices of non-tradables could reflect productivity improvements in its production or an increase in some resource endowments, among several other factors.

One method for isolating the impact of competition on Dw_N could consist of the construction of an indicator of market power in the non-tradable market. For example, by using a definition of the Lerner Index[24] we can estimate the difference between the actual prices of the non-tradable input and a hypothetical price that would maintain market power (on average) constant during the period of analysis. The reduction in the difference between the price of non-tradables and that of constructed prices could be attributable to the improvement in competition conditions in that market.

A final remark related to the concept of competitiveness used in this chapter – in the context of this chapter, we will use the concept of competitiveness as the capacity of firms to gain access to markets through reducing production costs (among other factors). This could be achieved by means of internal or external economies. Hence, a reduction in the prices of non-tradables helps domestic firms to achieve external economies contributing to strengthen their ability to compete in domestic and external markets.

4. Methodology

Based on the theoretical framework described in the last section, we can develop a general methodology in order to assess the impact of increased competition in electric power markets on competitiveness in other sectors of the economy. Generalizing the expression (3) to an economy with M inputs and N products, we get:

$$(5)\quad \left[P_j\right]_{N\times 1} = \sum_{i=1}^{M} a_{ij} P_i + a_{ej} P_e$$

where $[P_j]$ depicts the vector of prices of products and a_{ij} is the technical coefficient which relates the input i to the output j. Accordingly, P_e is the price of the electricity and a_{ej} is the technical coefficient which relates the input e (electricity) to the output j.

The indirect effects of a change in the price of electricity must be analysed in another equation, incorporating the impact of changes in the electricity price on the prices of other inputs.[25] Replacing these results in (5) we get:

$$(6)\ \left[P_j\right]_{N\times 1} = \frac{\sum_{i=1}^{M} a_{ei} P_e a_{ij}}{(1-\sum_{k=1}^{M} a_{ki})} + a_{ej} P_e$$

This equation could be used to quantify the effects of a change in the price of electricity on the prices of other sectors of the economy. Indeed, the first part of the right-hand expression in (6) describes the indirect effects and the second the direct effects of changes in the price of electricity for N different sectors of the economy. In sectors in which electricity is relatively important as an input, the direct effects will dominate the indirect effects. The opposite occurs in sectors which consume a high proportion of inputs other than electricity.

Equation (7), which is a generalization of expression (4), could be used to predict the impact of changes in the price of energy on the prices of the products of the economy:

$$(7)\ \left[\Delta P_j\right]_{N\times 1} = \left[\frac{\sum_{i=1}^{M} a_{ei} a_{ij}}{(1-\sum_{k=1}^{M} a_{ki})} + a_{ej}\right] \Delta P_e$$

Given that generation is subject to a cost-based regulation, in the case of the Peruvian market, it is difficult to construct market power indicators for generation firms based on Lerner Indexes.[26] Moreover, in the case of the price of electricity paid by end-users, in the regulated market, there are components of the end-user price that are determined exclusively by regulation, such as tariffs for transmission and distribution.[27] For these reasons, instead of using a pure competition indicator (as a Lerner Index) we will use an indicator of competition and regulation performance. This indicator will be the real price of electricity sold to final consumers.[28]

Another important reason for using a "competition and regulation" performance indicator is the complementary and interdependent role that economic regulation and competition has played during the process of reform. Economic regulation was in charge not only of setting transmission and distribution fees (which represent a

component of final price) but also of guaranteeing the access of competitors to distribution and transmission networks. Distribution and transmission fees represent a significant fraction of the end-user price (which is the actual price paid by customers). During the last years, for example, the value added of distribution represented around 35 per cent of the end-user prices. Access policies are also crucial for promoting entry to markets of final customers. A poor performance of these policies could limit or restrain the effectiveness of deregulation and competition.

In order to address the total potential savings caused by a reduction in energy prices, we multiply price variations obtained in (7) by Q_j (total production of sector j). On the right-hand side, we can do the same using the ratio (Q_j/Q_{ej}, where Q_{ej} is the production of electricity sold to sector j), which is a proxy of productivity of electricity in this sector.

$$(8)\ Q_j\left[\Delta P_j\right]_{N\times 1}=\left[\frac{\sum_{i=1}^{M} a_{ei}a_{ij}}{(1-\sum_{k=1}^{M} a_{ki})}+a_{ej}\right]\Delta P_e\frac{Q_j}{Q_{ej}}Q_{ej}$$

The input-output matrix, which consists of a double entry table that relates supply of inputs to demand from each sector of the economy, used for this calculation is the 1994 matrix, source INEI.[29] The dimensions of the matrix are 287 rows of inputs and 45 columns of products. One advantageous characteristic of this matrix is that the electric sector is included separately in one of the rows. However, for calculating the indirect effects, it was necessary to use some ad hoc assumptions to split the 45 columns into 287 sectors[30] in order to work with a squared matrix.

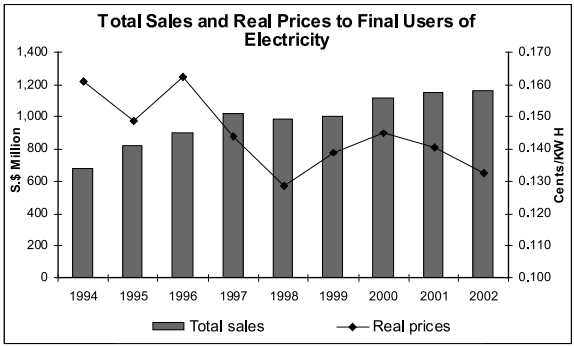
5. Results

In this section, we estimate the impact of the reduction in electricity prices during the 1994–2002 period on the competitiveness of the economy. Figure 3 shows the decreasing trend in the real prices[31] of electricity and the growth of energy sales during this period. The accumulated percentage of reduction of this price between 1994 and 2002 is 17.6 per cent. Based on this figure, is possible to estimate the amount saved by consumers as a result of reduction in the real prices of energy.[32] Indeed, multiplying the total consumption of energy by the difference between yearly real prices and the 1994 prices, we get US$ 530.8 million. This amount equals 6.5 per cent of the total sales of electricity during the 1995–2002 period.

Table 3 shows how this reduction in real prices could be divided between sectors which consume electric energy as an input, according to the input-output matrix of 1994. Around 45 per cent of the benefits of the reduction in prices of energy during the 1994–2002 period were directed to households. If total benefit from price reduction was US$ 530.8 million, the savings for households, during the period, could be

estimated as US$ 239.1 million. Other sectors that benefited from reduction in energy prices were commerce (7.8 per cent), metal mining manufacturers (4.9 per cent), services to companies (3.9 per cent), mineral extraction (3.4 per cent) and government services (3.3 per cent).

Figure 3. Total sales and real prices of electricity to end-users.



Source: Osinerg, INEI

Table 4 shows the estimates of direct and indirect effects of reduction in prices of electricity, using the technical coefficients included between the parentheses of expression (7) obtained from the input-output matrix. The total effect varies between nearly 0 per cent and 5 per cent. The sectors in which this percentage is most important are paper manufacturing (5.0 per cent), chemical basic products (4.8 per cent), mining manufacturing products (4.8 per cent) and rubber and plastic manufacturing (nearly 4.0 per cent). Notice that for the final demand of electricity the total estimated effect is 2.7 per cent.[33]

As was argued through our simple model presented in section 3, in those sectors where consumption of inputs other than electricity represents a relatively high share of the total inputs consumed, the direct effects are higher than the indirect ones. Indeed, in sectors such as textiles, clothing, pharmaceuticals, inter alia, indirect effects are higher than direct effects. The number of sectors in which indirect effects dominate is 26 (nearly 60 per cent of the total). Notice that in the case of final demand for electricity, the indirect effects (1.4 per cent) also dominate the direct effects (1.29 per cent).

In sectors in which consumption of electric power is relatively important, direct effects are higher than indirect effects. For example, this is the case for mineral extraction and production, paper manufacturing and chemical basic products.

In order to address the impact of a reduction in prices of electric energy on the competitiveness of industry, we need to estimate the effects of this reduction on prices of goods and services. The annual price changes are small. However, when the latest figures are taken into account, results are quite significant.

6. Final remarks

The lack of competition in the markets of non-tradable goods is a factor that may limit substantially the competitiveness of industries intensive in the use of non-tradable inputs. The recent experience of privatization, deregulation and competition promotion applied to the electric power sector in Peru provides an interesting example of how a combination of these policies can be reflected in a better performance of the industry, more competition in the electricity generation market (of non-tradable inputs), reduced prices of energy, and improved quality conditions for intermediate and final consumers (including industries of tradable goods and services). The actual and potential benefits associated with the promotion of competition in electric power, can be measured through its impact on the competitiveness of other industries. Indeed, electric energy constitutes an important input for many economic activities in Peru (representing around 2 per cent of Peruvian GDP), including the production of tradable goods arising from mining industries.

The main goal of this chapter was two-fold. In the first place, it aimed to develop a general framework, based on the use of the input-product matrix, in order to evaluate the impact of competition and market power in non-tradable markets on other industries' competitiveness. The second objective is to apply this methodology to the electric power market in order to quantify the actual and potential impact of increased competition and reduced market power on other industries during the 1994–2002 period.

The main results can be summarized as follows:

- From 1994 to 2002, the real prices of energy sold to end-users showed a cumulative reduction of 17.6 per cent. Assuming a Leontief technology, total savings to electricity consumers associated with reduction in real prices during the 1994–2002 period were US$ 530 million. This amount equals 6.5 per cent of the total sales of electricity during the 1995–2002 period. The sectors which benefited most from this reduction were households, commerce, metal mining manufacturers, services to companies, minerals extraction and government services.
- Regarding the impact on competitiveness from reduction in prices of electricity, the sectors in which the effects were most significant were manufacturing, chemical basic products, mining manufacturing products, and rubber and plastic manufacturing.
- One of the most important lessons from the reform implemented in the electric energy sector in Peru, during the last decade, is that the success of a process doesn't depend exclusively on the individual performance of the competition agency, the sectoral regulator or the privatization agency. The success of the

reform will also depend on a combination of antitrust, privatization and regulatory policies and on the internal consistency and coherence between them. Additionally, the coherence and consistency of the institutional framework will depend critically on the political commitment of the Government to the process.

For the above-mentioned reasons, the empirical evaluation of the results of the reform and its impact on consumers, in this chapter, was based on a "regulation and competition" indicator (real prices of energy sold to consumers), in order to reflect also the degree of complementarity and consistency between different policies.

The methodology developed in this chapter could be easily extended to other non-tradable sectors and industries (such as infrastructure, ports, rails, telecom), in which competition is technically and economically feasible. Indeed, the promotion of competition on non-tradable markets in developing countries constitutes a priority of any government engaged in a competitiveness strategy. A foregone conclusion is that trade and financial liberalization in these countries exposed tradable goods and services to foreign competition and, consequently, the benefits of competition were easier to achieve in these markets; non-tradable goods, in contrast, would be subject to a more stringent scrutiny by the competition authority.

Another important lesson from the reform implemented in the electric energy sector in Peru, during the last decade, is that the success of a process of competition promotion doesn't depend exclusively on the individual performance of the competition agency, the sectoral regulator or the privatization agency. The success of the reform will also depend on the combination of antitrust, privatization and regulatory policies and on the internal consistency and coherence between them. This doesn't means that individual performance of public agencies is not an important factor in determining the success of the reform. Indeed, in the case of the Peruvian electricity market, for example, the benefits of competition promotion through antitrust policies and privatization (for example in terms of lower prices of generation) could have been offset by a poor performance of the sectoral regulator (in terms of high prices in transmission and distribution). The opposite could also occur: the benefits of an efficient price and quality regulation could have been obscured without an effective antitrust or privatization policy.

However, the evaluation of the individual performance of the antitrust agency, the regulatory body or the privatization organization, will depend crucially on their institutional objectives and goals. In order to guarantee consistency between antitrust policy, regulation and privatization, is important not only that functions assigned to these institutions be clearly defined but also that their goals and objectives be complementary to the objective of competition promotion.

The coherence and consistency of the institutional framework will depend critically on the political commitment of the government to the process. In the design of the institutional setting and the division of powers between different agencies and public organizations, the government certainly plays a central role. The successful

Peruvian experience in the electricity market reform would not be possible without government support in the approval of the Concessions Law in Electricity, Law 26876 or COPRI's decision to privatize electric public companies. Conceiving a long-term vision of the process of reforms and the inclusion of competition policy as a tool that could contribute to achieving some of its objectives (attracting new investment, increasing welfare, among others) are among the main tasks that government faces in order to guarantee the success of the reform.

Once the institutional setting is created, a close coordination between the different organizations involved in the process must be ensured. The coordination channels could be formal or informal. In the case of the Peruvian experience in the electricity sector, for example, during the process of merger reviews Indecopi invited the regulator (Osinerg), among other entities, to present an opinion about the case. In other cases, COPRI requested Indecopi's opinion informally about certain clauses included in concession contracts. Even though these informal mechanisms have been used during these years, it would be desirable to strengthen them, establishing formal procedures for requesting opinions about the privatization process, concession contracts, etc. These formal mechanisms will contribute not only to improving the transparency of the process but also to promote consensus about the goals and objectives pursued by the authority.

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Table 3. Participation in benefits of the reduction of price of electricity.

Sector	Participation	US$ millon
Households consumption	45.1%	239,178,419
Commerce	7.8%	41,174,344
Metal Mining Manufactures	4.9%	25,893,002
Services to Companies	3.9%	20,584,801
Minerals extraction	3.4%	17,854,347
Government services	3.3%	17,342,793
Restaurants and Hotels	2.6%	13,960,002
Non-Ferrous Metals Transformation	2.2%	11,832,649
Manufacturing of Basic Chemicals	1.9%	10,302,575
Transport and Communications	1.9%	9,939,659
Electricity and water	1.9%	9,893,488
Textile	1.8%	9,633,256
Private Education	1.6%	8,742,213
Paper Manufacturing	1.2%	6,536,230
Other Food	1.2%	6,500,168
Financial Services	1.2%	6,350,504
Milling and Pastry	1.2%	6,313,132
Iron and steel industry	1.1%	6,042,939
Private Health	1.1%	5,635,117
Metal and wood furniture	0.9%	4,875,379
Other manufactured products	0.9%	4,616,861
Printing and edition	0.8%	4,317,436
Rubber and plastic manufacturing	0.8%	4,230,124
Beverage and tobacco	0.8%	4,056,340
Commercial services to households	0.7%	3,677,204
Other Chemical Products	0.6%	3,387,752
Non-Commercial services to households	0.6%	3,385,697
Manufacturing of Metallic Products	0.6%	3,037,131
Fish flour and oil	0.5%	2,867,556
Clothes	0.5%	2,703,476
Transport materials manufacturing	0.5%	2,467,056
Electric Machinery construction	0.4%	2,351,032
Construction	0.4%	2,101,908
Oil Refining	0.3%	1,563,439
Non-electric machinery manufacturing	0.2%	1,063,338
Exports	0.2%	1,053,779
Production, Agriculture and farming	0.2%	1,024,215
Leather manufacturing	0.2%	912,130
Oil extraction	0.2%	826,897
Pharmaceutical production	0.1%	692,483
Footwear manufacturing	0.1%	544,345
Fish production and preservation	0.1%	523,606
Milk and others	0.1%	366,968
Sugar production and refining	0.0%	217,449
Insurances	0.0%	193,946
Fishing	0.0%	2,955
Hose renting	0.0%	0
Total demand	**100%**	**530,770,143**

Source: INEI; Elaboration: Own calculations. Note: In the first column the formula used was e_i/E, where E is total electricity production and e_i is the share of the demand of electricity corresponding to sector i. The second column includes the result of multiplying total savings in energy (US$ 530 million) by e_i/E.

Table 4. Indirect and direct effects of changes in electric power prices.

Sector	Indirect effect	Direct effect	Total effect
Production, Agriculture and farming	0.48%	0.03%	0.51%
Fishing	0.49%	0.00%	0.49%
Oil extraction	0.00%	0.00%	0.00%
Minerals extraction	0.47%	1.06%	1.53%
Dairy products manufacturing	0.55%	0.15%	0.70%
Fish production and preservation	0.00%	0.00%	0.00%
Fish flour and oil production	0.00%	0.00%	0.00%
Milling and Pastry	0.60%	0.60%	1.20%
Sugar production and refining	0.35%	0.11%	0.47%
Other foods	0.39%	0.32%	0.70%
Beverage and tobacco manufacturing	0.88%	0.66%	1.54%
Textiles manufacturing	1.68%	0.94%	2.62%
Clothes manufacturing	1.49%	0.26%	1.75%
Leather manufacturing	2.21%	0.72%	2.93%
Footwear manufacturing	1.79%	0.24%	2.03%
Furniture manufacturing	1.66%	0.82%	2.47%
Paper manufacturing	2.18%	2.81%	5.00%
Print and edition	2.69%	1.27%	3.96%
Chemical basic products manufacturing	1.60%	3.24%	4.84%
Pharmaceutical manufacturing	1.26%	0.24%	1.50%
Other chemical products manufacturing	2.06%	0.73%	2.79%
Oil refining	0.14%	0.16%	0.31%
Rubber and plastic manufacturing	2.68%	1.32%	3.99%
Mining metallic products manufacturing	1.11%	3.72%	4.83%
Non-ferrous metals transformation	1.29%	0.95%	2.25%
Diverse metallic manufacturing	2.16%	0.80%	2.96%
Non-electric machinery	1.29%	0.54%	1.83%
Machinery and electrical equipment	1.80%	0.82%	2.62%
Transport materials construction	1.86%	0.79%	2.65%
Other manufactured products	1.15%	0.99%	2.14%
Electricity and water production and distribution	0.33%	1.25%	1.58%
Construction	0.90%	0.06%	0.96%
Trade	0.00%	0.00%	0.00%
Transport and Communications	0.42%	0.23%	0.65%
Financial Service producers	0.40%	0.85%	1.25%
Insurance Services	0.41%	0.13%	0.54%
House renting	0.00%	0.00%	0.00%
Other Services	0.48%	0.60%	1.08%
Restaurants and hotels	0.43%	0.60%	1.03%
Services for households	0.31%	0.21%	0.53%
Non-Commercial Services for households	0.00%	0.00%	0.00%
Private health	0.56%	0.73%	1.30%
Private education	0.44%	0.60%	1.04%
Governmental Services	0.00%	0.00%	0.00%
Final demand	1.44%	1.29%	2.73%

Source: INEI; Elaboration: Own calculations. The first column indicates the indirect effects according to the following formula, taken from the first part of the parentheses of the left-hand side of equation (6)

$$\left[\frac{\sum_{i=1}^{M} a_{ei}\, a_{ij}}{(1 - \sum_{k=1}^{M} a_{ki})} \right]$$

The second column corresponds to coefficient a_{ej} .The third column includes the sum of both effects.

Notes

1 Economic Studies Manager of Indecopi. The opinion of the author doesn't necessarily reflect the institutional opinion of Indecopi. I would like to thank the criticisms and suggestions from Jose Gallardo. Also, I want to acknowledge the support and help received from Julio Aguirre and Fedor Molina. Any error is entirely the responsibility of the author.

2 Ministerio de Energía y Minas.

3 Instituto Nacional de Defensa de la Competencia y Protección de la Propiedad Intelectual.

4 Organismo Supervisor de la Inversión en Energía.

5 For the British telecom and energy industries, see Newbery (2002), for recent experience in the US, see Joskow (2003), and for a cross-sectional analysis applied to developed countries see Steiner (2000).

6 However, Steiner (2000) states that a high degree of private ownership and imminence of both privatization and liberalization tend to increase industrial end-user prices.

7 Individual country studies also support the conclusion that restructuring of the industry and promotion of competition could improve the performance of the electricity sector. Newbery (2002) through review of the UK experience, states that increased competition in electricity generation is necessary in order to reduce prices, emphasizing that this objective could only be achieved through separation of generation, transmission and distribution activities. This author also describes the process of reforms in Chile, Argentina and Mexico, among other developing countries.

In the case of the United States, Joskow (2003) states that competition in well-functioning wholesale and retail markets in this country is "work in progress". As a result of the process of deregulation initiated during the late 1990s, private investment in generation has grown, competitive markets have developed and access to transmission networks and associated support services has increased, among other positive outcomes. However, the reform in the United States has faced many imperfections associated with over-investment in generation and the persistence of market power in wholesale power markets, among others. Despite these poor results, there is a wide consensus around the importance of increasing competition in generation, wholesale and retailing markets as a means of improving the performance of the industry.

8 Includes also telecom, gas, rail transport and water.

9 For a general analysis of reforms implemented in Peru during the 1990s and their impact on competition in domestic markets see Cáceres and Ruiz (1998) and UNCTAD (2004).

10 Goods or services which cannot be exported or imported because of tariff or non-tariff measures, and transport costs, among other factors. In such cases, the geographic configuration of markets may be restricted to the country territory or even smaller regions.

11 Law Decree Nº25844.

12 Created through Legislative Decree 674, published in September 1991.

13 See Proyecto BID-CAF-Indecopi (1999).

14 In November 1997 Supreme Decree Nº017-97-ITINCI was enacted, which regulates and implements the provisions contained in Law Nº26876.

15 These cases correspond to a simultaneous vertical and horizontal concentration caused in the Peruvian market as a consequence of an international acquisition by the Endesa Group, from Spain. Indecopi's Free Competition Commission decided to approve the transaction subject to two conditions: (i) One of the generation companies of the Endesa Group should resign to participate in decisions of the Board of the System Operator (COES)

corresponding to the Central-North Interconnected System (Comité de Operación Económica del Sistema Eléctrico del Sistema Interconectado Centro Norte), until this system was integrated into the South transmission net; (ii) Edelnor, a distribution firm from the Endesa Group, must organize public auctions in order to encourage the participation of generators in areas in which that distribution company operates.

16 According to the methodology used by Indecopi, both state-owned and private companies are included in calculations of the IHH. Notice that despite the sharp reduction in the IHH during the period, in absolute terms, this index is relatively high compared with international standards. One factor that could explain this level of concentration, among others, is the relatively small size of the Peruvian market.

17 Different studies had reviewed the competition conditions in both the generator merit order dispatch (Indecopi; 1999), and the unregulated market (Indecopi; 2000).

18 See, for example, Campodónico (2002).

19 It includes 253 non-regulated users.

20 One of the main programmes of electrification implemented was the National Electrification Program (PEN).

21 See Campodónico (2002: 42).

22 For a more detailed and exhaustive analysis, see Proyecto BID-CAF-Indecopi (1999) *Op. Cit.* or Campodónico (2000).

23 These products may be tradable or non-tradable.

24 The Lerner Index (LI) is one of the most frequently used indicators to measure market power. It consists of the difference between price and marginal cost of production divided by the marginal cost of production. When this index grows, market power is higher, and *vice versa*. It is supposed that when competition in the market is weak this index tends to be higher and when competition is intense the LI tends to decrease.

25 The equation for other input prices is:

$$P_i = \sum_{k=1}^{M} a_{ki} P_k + a_{ei} P_e$$

We can iterate over the same expression replacing P_k and getting the following result:

$$P_i = \frac{a_{ei} P_e}{\left(1 - \sum_{k=1}^{M} a_{ki}\right)}$$

Replacing this result in (5) we get equation (6).

26 For a discussion about the concept of market power in the electricity generation market see Borenstein (1999).

27 Competition certainly has been one of the key factors that influenced the reduction in prices to end-users. Indeed, between 1995 and 2002, according to information from Osiner, the real prices of generation and energy sold to non-regulated users, declined by 17.8 per cent and 20.8 per cent, respectively.

28 There are other factors that can influence the price of energy. On the supply side, in the case of Peru, climatic conditions may influence price through their effects on capacity and water availability for hydroelectric plants. In the case of thermal electricity, the price of petroleum is a key variable that influences the costs of generation. On the demand side, economic activity, especially the evolution of industrial output and the international prices of some products related to the production of raw materials, such as the mining sector or mineral refining, among others, could be identified as key variables that influence electric

energy prices.

29 Instituto Nacional de Estadísticas.

30 To split the columns into 287 sub-sectors, the corresponding technical coefficients of each product were multiplied by the share of the sub-sector production on total production of the sector. The assumption behind this transformation is that inside each product sector, the relative importance of inputs is proportional to the sum of total production of inputs.

31 Calculated as the ratio of the price of electric energy sold to end-users divided by the Consumer Price Index (IPC). See Anuario Estadístico 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, Osinerg: www.osinerg.gob.pe.

32 Under the assumption of a Leontief technology, the demand for inputs is completely inelastic. Thus, any increase or decrease in the price of the input will generate an increase in total excedent of firms and consumers.

33 Final demand includes demand for electricity from both final consumers and firms. Regarding final consumers, it is important to consider that participation of electricity in the Consumer Price Index is 2.234 per cent for Lima and 2.255 per cent at national level.

V Conclusions

COMPETITION, COMPETITIVENESS AND DEVELOPMENT: RE-STATING THE CASE

Philippe Brusick, Lucian Cernat, Ana Maria Alvarez

Throughout this book, it has been argued that competition laws and policies in their various forms can be used as a tool for enhancing competitiveness and development. The book offers a number of suggestions to developing countries on how to maximize the benefits stemming from well-implemented competition laws and policies. Based on a selection of country case studies, ranging from larger more advanced developing countries such as Brazil, Peru, Republic of Korea, Thailand and South Africa, to least developed countries (Nepal, United Republic of Tanzania, and Zambia), this book offers clear arguments about the development-related aspects of competition and the pre-requisite institutional environment necessary for effective competition policy implementation.

In this concluding chapter we summarize some of the major findings and point out some challenges facing developing countries in adopting and implementing competition laws and policies.

That all countries, including developing countries and LDCs, are adversely affected by anticompetitive practices is unquestionable. Similarly, there is a widespread belief that the creation of competitive markets empowers the poor, provides them with employment opportunities, and increases their access to cheaper and better quality products. Competition policy is therefore an important institutional pillar for a thriving market economy wherein competitive pressures hone production efficiency and stimulate product and process innovation fundamental to international competitiveness and economic growth.

While recognizing that globalization and liberalization of goods and services markets had the potential to improve national welfare, the studies included in the book show that market failures, especially in developing countries, can pose major challenges to their competitiveness. As governments increasingly become cognisant of the fact that international markets are characterised by imperfect competition rather than the ideal competition of liberal economic theory, the role of competition law and policy becomes fundamental in ensuring a “level playing field”. In such a complex

and dynamic economic environment, competition, competitiveness and overall economic performance are closely intertwined.

Competition policy and economic performance

A major contribution of the book is to fill some of the gaps in the existing literature of *ex-post* studies quantifying the effects of competition policies in developing and least developed countries. As the various chapters suggest, competition, competitiveness, and development are intrinsically linked. This is not merely a conceptually attractive theoretical proposition but also a basis for clear policy recommendations.

For instance, as the analysis of the Tanzanian experience clearly showed, various aspects of competition policy played an important role in spurring international competitiveness. The evidence provided by firm-level performance indicators (such as investment, productivity and export performance) suggests a robust positive relationship between government measures aiming to stimulate competition and protect consumers against anti-competitive practices. As international competitiveness depends on a country's ability to consolidate, upgrade and diversify its productive capacity, a well-implemented competition policy may act as a crucial ingredient in a successful development strategy.

Moreover, as several contributors have convincingly argued (the Korean experience is a *locus classicus* in this regard), in the long run full confrontation with competition has been essential to ensuring the continuing development of industries, at all stages of development. In order for protected industries to gain significant economies of scale and become globally competitive in the true sense of the term, "infant industry" protection should be applied selectively, made conditional upon meeting performance standards, transparent, time-limited, involve minimum discrimination, and, above all, be constantly reviewed. It has to be also recognised that providing protection to the domestic sector, particularly to infant industries, is the second best option. For instance, Amsden and Singh (1994) shows that even in Korea, a typical example for the infant industry argument, there existed more competition than is often thought, and not all of the growth was due to government protection and subsidies. Moreover, the chapter by Yun in this book convincingly argues that although increased monopoly rent may boost up productivity growth on the short term, it may hinder economic development in the long run, and that the latter effect is prevalent.

Further, it is not only the degree of competition that matters, but also the nature of competition that stimulates growth. As developing nations implement structural reforms designed to stimulate economic growth through greater reliance on the market system, concerns regarding competition policy naturally arise. These nations have a unique opportunity to create new conceptions of competition policy designed to promote the competitive process and foster development.

Several contributors (see in particular the chapters by Hartzenberg and Lipimile) have shown that enterprise development has been successfully transformed into a

major "public interest" policy objective with the introduction and enforcement of competition laws in South Africa and Zambia. Such policies not only complemented the existing development-related policies, but also specifically benefit SMEs and increase the competitive edge of larger firms. A large body of literature suggests that SMEs from developing countries face significant constraints. In particular, SMEs are most likely to face imperfect financial markets where transaction costs preclude their growth. Thus, given these market imperfections, SMEs may require public funding to achieve socially desirable goals. An effective competition policy focused on enterprise development in a dynamic market may also encourage innovative behaviour, given the knowledge that innovation encourages technological advance and technological advance stimulates economic growth and the competitiveness of firms. Large firms with market power may be able to realize advantages of firm size, and their market power may stimulate R&D investment, but the potential source of innovation and rapid adaptation to market changes provided by SMEs should not be neglected.

Competition policy and sound institutional environment

One central argument in the current development debate is that good governance has become the key variable in explaining the economic performance of successful developing countries over the last few decades. As part of good governance and institution building, an increasing number of developing and least developed countries have adopted competition policies at national level, as part of a coherent set of policies to create comparative advantage and internationally competitive industries. As the contributors to this book tried to demonstrate, there are various mechanisms through which competition policy can positively impact on a number of key macro- and micro-economic ingredients for competitiveness and development. In short, competition policy is needed by all countries, but it should be accompanied by the right pre-conditions and measures.

Good governance of regulatory agencies is also a major factor that can improve sector performance. For instance, the empirical evidence included in this volume based on the Brazilian experience suggested a positive relationship between the level of independence of Brazilian regulatory agencies and the performance and effectiveness of their respective regulated sectors. Similarly, one of the most important lessons from the reform implemented in the electric energy sector in Peru, during the last decade, is that the success of a process of competition promotion does not depend exclusively of the individual performance of the competition agency, the sectoral regulator or the privatization agency. In the case of the Peruvian electric market, the book shows that the benefits of competition promotion through competition policies and privatization (for example in terms of lower prices of generation) could have been offset by incoherent policies. The contributors of the book also argue the importance of a cautious policy on the adoption of exemptions and exceptions. Exemptions for state-owned enterprises and exceptions provided for regulated private companies have certain justification, but proved to be costly to the economy when effective regulatory regimes are not yet in place (see for instance the chapter

on Thailand). The impact of these exemptions and exceptions vary, depending on the scope and scale of the alleged restrictive practices and the nature of players in the market.

However, several contributors cautioned that merely adopting a competition law is no panacea. Instead, what really makes a key contribution to competitiveness and development is properly implemented competition policies. Moreover, favouring a competitive environment in other economic sectors through other policies that are directly or indirectly linked to competition policy, (e.g. establishing production standards, defined property rights, consumer protection agencies, efficient institutional frameworks with adequate human, technical and financial resources) would also have a 'multiplier effect' on the overall benefits expected from competition policy implementation. As Michal Gal argued, any successful unfolding of these processes will depend on the "ecology of antitrust". If not part of a well-coordinated set of legal and economic institutions, the impact of competition policy on productive capacities and in favour of more competitive economies is likely to remain minimal. The existence of large informal activities (in some developing countries the informal sector is thought to account for as much as 60% of their GDP), the lack of well defined property rights, limited environmental, safety and health standards, underdeveloped consumer protection institutions and laws, limited capability to verify and check standards, lack of technical expertise and experience, may all limit the potential benefits stemming from an effective competition policy implementation.

This points out that policy-makers in developing countries face the challenging task of designing appropriate competition policies that will bring about economic development in these countries. As discussed earlier in this book (see for instance the chapters by Gal, Adhikari, and Nkikomborirak), there are several characteristics in developing countries that certainly can make the task of competition policy design and implementation difficult. For instance, while market entry and access are the key elements of market economies that many developing countries are currently striving to achieve, in practice, in most developing countries the "invisible hand" of the market does not always operate very smoothly and indeed the instance of market failures are rather frequent.

The theoretical explanation for market failure in developing countries is that the high transaction costs and asymmetric information in these countries limit economic efficiency. Competition authorities should therefore perform two most important functions: eliminating *private* and *governmental* barriers to entry.

When dealing with *private barriers to entry*, the authority must have sufficient economic expertise to assess the business practices of dominant firms in order to challenge only those practices that impede the competitive process by erecting artificial barriers to entry. In addition, as several contributors suggested, to ensure that these benefits are materialized, competition authorities should be insulated from the rent-seeking activities of business and political interest groups. The task of identify-

ing and challenging the entry-deterring business practices of dominant firms requires sophisticated and discerning competition authorities that can distinguish between pro and anticompetitive business practices, implement a workable definition of dominance, count on efficient procedures for examining defences of challenged business practices, and apply suitable penalties or other remedies to eliminate the use of practices deemed anticompetitive. Developing countries need to improve the system of data collection and reporting on the competition matters e.g. concentration, determination of market power, investment behaviour of the producing firms, and other possible measures of competition and encouragement and facilitating training in disciplines necessary for the competition policy implementation such as competition law, economics that has strong emphasis on competition aspects and the related fields. However, conditions prevailing in most developing countries and uncertainties regarding existing rules make this objective extremely problematic. For instance, the process of determining dominance, as the case of Thailand suggests, is complex, controversial, and critical to effective competition policy implementation. Without clearly defined, simple operational rules, competition authorities can hardly discourage dominant firms from using anti-competitive practices (e.g. exclusive dealing arrangements, refusal to deal, predation, exclusive access to essential facilities, mergers aimed at increasing market power) designed to deter entry and stifle competition. Furthermore, as the case study of Nepal has shown, given limited financial and technical capabilities many developing countries can hardly afford to establish new institutions manned by required expertise and institute a well-functioning competition policy without appropriate technical cooperation. Hence, the need to provide technical and financial assistance to developing countries engaged in the design and implementation of national competition legislation cannot be stressed enough.

Not only private barriers but also governmental barriers can impose major restrictions to competition and competitiveness. A competition authority may identify and amend public policies, rules, and laws that restrict competition. The competition authority should therefore be a senior partner in developing countries that are attempting to reform their economic systems and incorporate more market-oriented reforms. Privatisation and deregulation strategies, as well as trade reform plans (to name just a few) should include key inputs and guidance from competition authorities. Ultimately, the success of the reform process will also depend of the combination of competition policies, privatization and regulatory policies and of the internal consistency and coherence between them. Given these reasons, the competition authority's role is broader and even more fundamental than that normally associated with competition authorities in developed countries.

The competition authority also could play an important role in eliminating or reducing other barriers to entry. Given the conditions that characterize most developing countries, natural barriers to entry significantly deter competition. Through competition advocacy, an active competition authority could coordinate with other state agencies in promoting more favourable business conditions. For instance, Baumol

(1992) suggests adopting public policies that encourage the exchange of technology, including incentives for licensing, and signal a clear commitment not to penalize technological joint ventures in order to promote inter-firm cooperation in producing and disseminating technology. However, effectively tackling natural barriers to entry is a difficult challenge (particularly in many developing countries with shallow financial sectors, limited educational and training opportunities, and limited technological capacities) and having too high expectations from competition authorities in these areas would be unrealistic.

Directions for further research

So far we have seen that a clear understanding of the sources of the market failure is a useful step in trying to design an effective competition policy that could enhance the competitiveness of developing countries. In practice, a well functioning competition policy needs to be linked with other rules and regulations in a particular economy. It is important to understand how competition, and competition law and policies work in different economic and institutional settings. This means that one needs to look at both general and specific settings in which competition policy needs to operate. This was precisely the major attempt throughout all chapters included in this volume, be they qualitative or quantitative in their methodological approach. By locating the firm at the centre of the analysis, the country cases included in the book tried to build bridges between general analyses on the benefits of competition policy and microeconomic studies, two approaches that are all too often disconnected.

Given the complexity of the task at hand, some caveats are in order. Some of the effects of competition are not easily measurable, or there may be little available empirical evidence thereon, while some evidence may be inconclusive or ambiguous. Furthermore, it may be difficult to isolate the effects of more competition from other domestic reforms. For instance, liberalization and the elimination of distortions within an economy do not automatically lead to growth in the absence of the supply capabilities to take advantage of new opportunities, and the prevalence of competition is only one factor determining countries' growth rates. It should also be mentioned that the findings of the chapters discussed above often do not take into account all adjustment losses, which one may reasonably suppose to occur in countries where competition policies are adopted as part of a broader reform process.

One way in which some of these shortcomings have been dealt with in the book, was to adopt complementary methodologies. Qualitative analyses look at the more general pre-conditions that competition policy needs in order to fulfil its objectives. Quantitative methods take a narrower approach and investigate the impact of specific features of competition and competition policy on several economic variables, thus making the overall argument more convincing. The quantitative chapters suggest that when well-implemented competition policies fulfil their objectives (such as lower prices and higher quality for consumers, and enhanced efficiency across all sectors) competition authorities will have acquired their own "legitimacy by results".

Even if quantitative tools do not give us precisely measurable data, they provide the confidence that making the necessary political and economic reforms related to the introduction and enforcement of competition law and policy will necessarily improve the developments prospects of developing countries and LDCs.

Despite these difficulties, the main argument coming across the country cases included in this volume is that competition policies implemented in a coherent manner, not only with regard to their own objectives but also vis-à-vis the broad development objectives at national level, usually lead to better policy decisions and efficient use of society's resources. The chapters included in the volume therefore offer important insights about the benefits of competition policy for competitiveness of developing and least-developed countries. It is likely that the above estimates understate the benefits of reform, as several mechanisms through which competition contributes to improved welfare (e.g. qualitative assessments in terms of better service quality or pressures to innovate) are not taken into account.

For more general conclusions regarding application of competition policy for developing economies, it would be important to directly test other hypotheses found in the literature, such as the optimal competition theory. Similarly, it would be interesting to further investigate the linkages between increased competition, corporate governance and social corporate responsibility in developing countries. Additional research may also shed light on specific developing countries and economic sectors where scale economies are significant and where the blind pursuit of a policy designed to provide for 'maximum competition' will merely lead to low capacity utilisation and will diminish both economic growth and international competitiveness. For these and other reasons not fully explored in this book, policymakers should conceive appropriate tailor-made competition policies that take into account the specificities of developing countries.

Competition policy and development: a stake in the future

While some aspects related to the design and implementation of competition policy may still deserve further investigation, the discussion in the previous chapters brought out one clear conclusion: mainstreaming a certain degree of competition into a successful policy framework is fundamentally pro-development. Ensuring that competition policy contributes to enhancing the development prospects of developing and least developed countries has been a longstanding preoccupation in UNCTAD (Brusick and Cernat 2004). Over almost four decades, UNCTAD's work in this area proved that the case for national competition policies can hardly be overstated. As noted in the introduction to this volume, Adam Smith clearly understood the significance of competition and market entry over 200 years ago. This widely held notion remained perennial in economic thinking and there is now widespread recognition of the need to adopt national competition policies, both for reasons of equity and on grounds of economic efficiency. Joseph Stiglitz, the 2001 Nobel Prize winner, makes the argument forcefully:

"Strong competition policy is not just a luxury to be enjoyed by rich countries, but a real necessity for those striving to create democratic market economies." (Stiglitz, 2001)

Therefore, the economic rationale for competition policy remains of paramount importance. This is particularly so for those developing and least developed countries moving towards market-oriented reforms. Several specific reasons call for adoption of competition law sooner rather than later. Firstly, the adoption of liberalisation policies, the rise in privatisations, and the fact that most privatised entities in the utilities sector are natural monopolies underscore the importance of a solid competition regime to elicit the most favourable efficiency and welfare effects of liberalisation and privatisation. In some cases, privatisation and deregulation have taken place with scant regard for, and often in the absence of legal and institutional frameworks for competition policy. In a period of extensive deregulation, the adoption of competition law and policy represents a complementary measure that would "bring the state back" in ways that support and reinforce recent market-oriented reforms, while limiting the scope for unnecessary regulation. During such an adjustment process, one challenge ahead is to infuse competition principles with sound economic analysis that reflect the special characteristics in which firms and policy-makers operate when "rebuilding the ship at sea".

Secondly, the recent proliferation of massive international mergers, the existence of international cartels and their potentially negative impact on consumers (Evenett, 2003) puts forward a case for competition policy to equip developing countries with the tools to deal with the increased market power of multinational companies and their anti-competitive practices. Such evidence suggests that, once the "deep waters" of government-imposed trade barriers are gradually removed, the "mountain peaks" of trade-related private anti-competitive practices become even more apparent.

Even though national competition policies may be poorly equipped to deal with such potential negative external influences, the importance of domestic competition policies stems also from the differential impact that domestic and competition from abroad may have during adjustment periods. In certain cases, competition among domestic firms may have a relatively more beneficial effect than foreign competition, not only because it increases rivalry with known competitors but also because it provides a 'level playing field' among similar competitors and a gradual exposure to competitive forces, before engaging in full-fledged competition on world markets.

Although national competitiveness means different things to different people, it basically involves building public-private partnerships for the purpose of promoting exports and economic development. As several contributors argued in this book, a development-friendly competition policy is best suited to promote competitiveness, while maintaining the right balance between the interests of all stakeholders. In this regard, the experiences of the countries included in this book contain key elements

for the design and implementation of tailor-made competition policies in developing countries and LDCs.

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