



**Trade Reforms, Incentives on Ground
and Firm Performance in Ghana**

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Ghana was one of the first African countries to initiate an IMF/World Bank-sponsored structural adjustment program. In 1983, the Government of Ghana (GOG) introduced its Economic Recovery Program after almost a decade of economic decline. The reform program encompassed both a stabilization program, designed to reduce inflation and achieve external balance, and an adjustment program, aimed at achieving higher rates of growth via a restructuring of economic incentives, export promotion and rehabilitation of infrastructure. The Recovery Program was phased over a number of years, with most of the reforms completed by the late 1980s.

While growth rates in Ghana have picked up as a result of these reforms — averaging about 5 percent real growth in GDP since 1988 — the expected dramatic increases in exports and in local and foreign investment have yet to materialize. Two explanations have been put forth to account for this limited trade and investment response. The first thesis is that the reforms may not have gone far enough or deep enough to change the structure of incentives on the “ground” sufficiently to elicit a significant response. It might be that the reforms themselves were not sufficient or that the impact of the reforms have been muted by policy-imposed distortions in other areas — for example, in the regulatory regime — or by mid-level government bureaucrats not performing their jobs efficiently. The second working hypothesis assumes that incentives have changed sufficiently, but questions whether firms are able to respond, either because they do not have the necessary human or financial capital to do so, or because they are constrained by the institutional environment and poor infrastructure, or both.

This study examines the first of these explanations; namely, whether or not, in the wake of government reforms, incentives on the ground have actually changed and by how much. A limited analysis is also made of firm responses to the incentive changes induced by the reforms. Unfortunately, without data on firms before and after the reforms, it is difficult to assess accurately the extent and direction of firm response. We begin the investigation with a review of the government’s trade policy reform program.

Ghana’s Trade Policy Reforms*

* This section is based on information from Chapter 6 of the “Trade and Exchange Rate Policy Study: The Case of Ghana” by Gabriel Castillo, 1995, and from World Bank Ghana Industrial Sector Review, 1985.

The process of trade reform in Ghana, which began with the Economic Recovery Program in 1983, took the better part of a decade to complete. During this period, the government radically devalued the currency and made significant changes in commercial policy. Reportedly, Ghana shifted from being one of the most inward-oriented countries in Africa, and perhaps the world, to one of the continent's most liberal trading regimes.

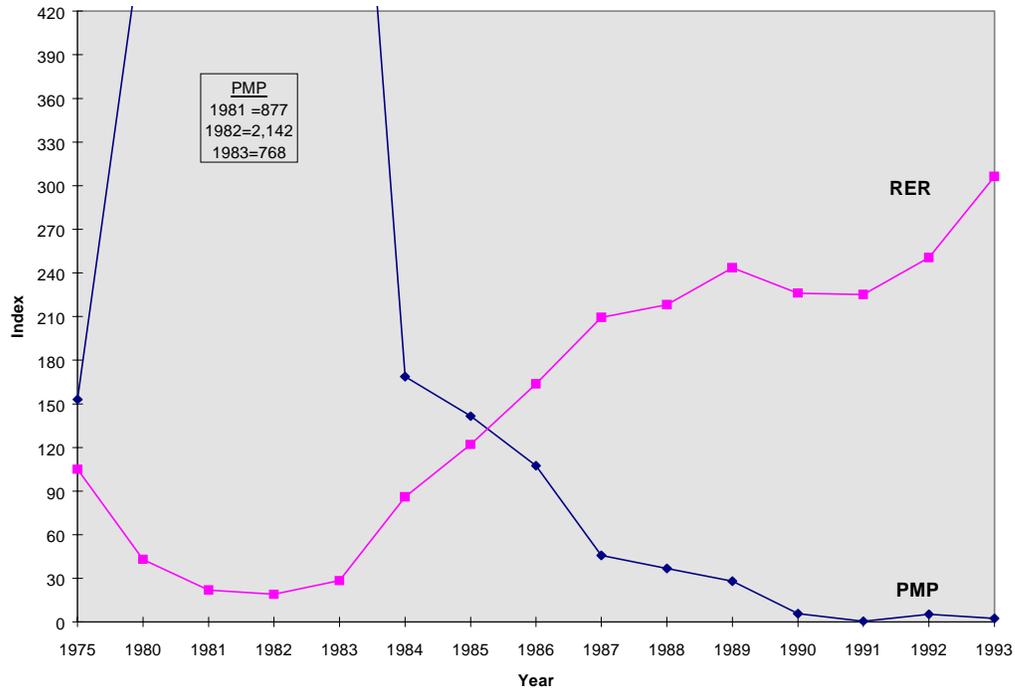
The Exchange Rate

The single most important problem in restoring economic balance at the start of Ghana's Economic Recovery Program was the grossly overvalued exchange rate. World Bank estimates in 1982 put the parallel market premium at 2100 percent. As Figure 1 indicates, it took government policy makers almost a decade to move from this highly overvalued fixed rate to a fully convertible floating currency. The movement of the parallel market premium in Figure 1 traces out the three phases of liberalization over the period.

Phase one consisted of a maxi-devaluation in 1983, followed by frequent small adjustments over the next few years. Over this period, the government allocated foreign exchange via a system of licenses. By 1986, the exchange rate had adjusted significantly toward its equilibrium level, but government rationing of foreign exchange continued to produce a parallel market premium of about 100 percent. In addition, rent-seeking and shortages of critical imports continued to plague the economy

In the second phase of the exchange rate reform, government shifted to an auction system, coupled with a fixed rate allocation, for official transactions. This dual rate system began operating at the end of 1986 and lasted several months until government unified both rates in early 1987. In effect, the auction system devalued the currency by a further 67 percent, But, in spite of the auction, a gap still remained between the official rate and the parallel market rate.

Figure 1
Parallel Market Premium — PMP (Percent)
and Real Exchange Rate — Cedis/USD (1983-86 = 100)



Source: World Bank (1996). *African Development Indicators*. Washington, DC.

In the final phase of liberalization in 1988 and 1989, the buying and selling of foreign exchange was shifted to private forex bureaus and to banks. As a result, over the next few years, the parallel market premium virtually disappeared by 1991.

In the end, Ghana’s gradualist approach succeeded in attaining a fully liberalized foreign exchange system, a substantial real depreciation of the currency, and the elimination of the parallel market premium. Today, the liberalized exchange rate system continues.

Commercial Policy

At the start of the Government’s Economic Recovery Program, both price and quantity measures were used to control trade. Price measures ranged from import tariffs to “special” taxes and “super sales” taxes, quantity measures included quantitative restrictions based on import licenses, bans on certain goods, as well as exchange controls.

The licensing system and exchange controls were governed by the Ministry of Trade's *positive list*, which specified the items allowed to be imported. Two types of licenses were issued based on this list — specific licenses and special licenses. Specific licenses could be funded by foreign exchange at the Bank of Ghana at the official rate, while special licenses could only be financed through the parallel market. Thus, by 1983, goods imported via a special license were burdened by the extra cost of the parallel market premium of 2100 percent.

Reform of this system of trade restrictions occurred gradually over the next seven years. The first cautious steps in reform were taken at the time of the maxi-devaluation in 1983. Tariffs were reduced and unified into three groups — the new rates were 25 percent on raw materials, 30 percent on capital goods, and 20 to 30 percent on basic consumer goods and luxuries, respectively. However, a complex array of differential excise and sales taxes, exemptions and quotas still remained, which made effective rates of protection much higher than implied by these new nominal tariff rates. In parallel with the tariff reforms, a few quantitative restrictions were also lifted and replaced by equivalent tariffs. These first steps in commercial trade policy reform really only scratched the surface of the complex array of protective instruments, and had very little impact on the level of protection.

It was not until the end of 1986 that additional reform initiatives were introduced. After a good deal of political in-fighting, the Ministry of Trade was forced to reorganize and the government streamlined the special import licensing program by replacing the positive list with a much shorter negative list. All goods not listed could be imported freely. Importers, even those dealing in consumer goods, were automatically granted licenses. Just about any product could be imported provided that the parallel market supplied the foreign exchange, which at the time placed an additional cost on imports due to the premium of about 46 percent.

Over the next few years, a series of steps were taken to eliminate the implicit foreign exchange tax on imports under the special license program. First, imports of producer goods, raw materials, spares and capital goods were given automatic licenses and foreign exchange for their importation was allowed to be obtained from the central bank's foreign exchange auction. Next, more consumer goods were deleted from the

negative list. Shortly thereafter, in 1988, virtually all imported goods, with the exception of a short list of luxury items, became eligible for foreign exchange funding at the Bank of Ghana's auction. Finally, in 1989, the import licensing program was abolished and exchange control via the licensing system disappeared.

In response to loud complaints from businesses hurt by the surge in imports under this new trade regime, the government began to backslide somewhat on the reforms over the next year. "Super sales" taxes of 75 to 500 percent were imposed primarily on imported products. In 1990, these taxes were lowered to 10 to 100 percent after much pressure from the donor community. In 1991, the taxes were dropped and sales and excise taxes across comparable imported and domestic products were unified. A new structure of nominal tariffs was also introduced in 1990, reducing the rates to 10 percent for raw materials, 10 percent for capital goods, and 20 percent for consumer goods (see Table 1). Some items, like agricultural imports and petroleum products were exempted from tariffs.

Table 1
Import Tariffs, 1983–90
(Percent)

<i>Category</i>	<i>1983</i>	<i>1984</i>	<i>1985</i>	<i>1986</i>	<i>1987</i>	<i>1988</i>	<i>1989</i>	<i>1990</i>
Concessionary tariff	10-20	10-20	20-25	10-20	10-25	10-25	0	0
Basic raw materials	25	25	25	10	15	10	10	10
Other raw materials	30	30	30	20	20	15	15	10
Capital goods	30	30	30	20	25	15	15	10
Consumer goods	30	30	30	25	35	20	20	20
Luxury goods	30	30	30	30	30	25	25	25

Source: GATT (1991)

Today, the tariff structure remains at the 1991 level. With the removal of foreign exchange controls and quantitative restrictions, tariffs are the only form of trade restriction remaining.

Other Policy-Induced Distortions

Price Controls

Prior to the Economic Recovery Program, price controls applied to virtually all traded and non-traded goods. In 1986, the government drastically reduced the number of

items under price control. Two years later, the remaining items were decontrolled and the legislation was repealed giving the government authority to control prices.

Export Controls

The overvalued exchange rate, import restrictions, licensing requirements for exports and other export procedures all worked together to create an enormous anti-export bias in Ghana before the Economic Recovery Program. Exchange rate reform and import liberalization throughout the 1980s were tremendously important steps in removing this bias. In addition to these initiatives, the government developed a program in 1986-87 to explicitly promote export growth. A duty drawback system was installed to reimburse exporters for direct and indirect duties and taxes paid on imported or domestic goods. Exporters were allowed to retain much more foreign exchange earned from exporting. Cumbersome paper work, such as exporter registration and licensing, was eliminated and a one-stop export documentation procedure was adopted. Also, port and customs clearance procedures for imported items for exporters were reformed.

Unfortunately, while exporters have been assisted significantly by freely floating exchange rates and reduced import restrictions, the government's export promotion programs have not lived up to expectations. The duty drawback system has never worked properly. Exporters wait many months or even years for rebates. The foreign exchange retention scheme has improved, but still does not allow exporters to keep enough of their foreign exchange earnings. And hassles at ports and with government officials over documentation continue to be costly.

Changes in Incentives on the Ground

For more than a decade, Ghana's Economic Recovery Program implemented large changes in trade policy. To what extent have these policy reforms translated into changes in incentives at the firm level? To answer this question, we examine changes in effective rates of protection over the ten-year period since the government's recovery program was initiated.

The effective rate of protection (ERP) measures the degree to which domestic value-added per unit in an economic activity is permitted to increase by the structure of

trade restrictions, in comparison to a situation in which trade restrictions are absent. The magnitude of ERP depends not only on the tariff or quota on the firm's final product, but also on trade restrictions on inputs and input coefficients in production. The level and ranking of industries by ERPs summarizes the total protective rate structure. ERPs are also indicative of the direction in which this structure causes entrepreneurs to shift resources as between economic activities.

To calculate ERPs, one compares the difference between value-added of a particular activity at domestic prices and value-added at world prices. The fraction by which the former exceeds the latter measures effective protection. This can be expressed as:

$$ERP = \frac{VA_d - VA_w}{VA_w}$$

where VA_d = value-added in domestic prices or tariff distorted value-added
 VA_w = value-added in world prices or what value-added would be in the absence of trade restrictions influencing the price of the final product or inputs to produce this product

Assuming fixed world prices and a single imported input, the ERP expression for a particular product can be written as:

$$ERP_j = \left[\frac{\frac{P_j - a_{ij}P_j}{P_j} - \frac{a_{ij}P_j}{1 + t_i}}{1 + t_j} \right] - 1$$

where t_j = nominal tariff on the final product.
 t_i = nominal tariff on the imported input.

Thus, the effective rate of protection measures the extent to which value added in the product j alters as a consequence of the entire tariff structure. It is clear that the measured rate of effective protection is determined by three factors: the tariff on output, the tariff on inputs and the value of the share of the final product j accounted for by the input i (i.e.,

the value of a_{ij}). Other things being equal:

- ERP will be higher, the higher the nominal tariffs on output;
- ERP will be higher, the lower the nominal tariffs on inputs;
- ERP will be higher, the higher the value of a_{ij} .

In practice, there are several factors which must be taken into account in measuring and interpreting ERPs. First, the a_{ij} s are assumed to be fixed, but in practice they may change as a consequence of protection.

Second, not all inputs are traded inputs, as we assume in the formula above. Some inputs, like labor and electricity, are generally non-traded. To include such inputs, we can modify the ERP formula in the following way:

$$ERP = \left[\frac{P_j - a_{ij}P_j - x_{rj}P_j}{\frac{P_j}{1+t_j} - \frac{a_{ij}P_j}{1+t_i} - \frac{x_{rj}P_j}{1+t_r}} \right] - 1$$

where x_{rj} = share of the rth non tradeable input in output j.

Extending the effective protection concept to include multiple inputs and non-tradables, the estimating formula becomes:

$$ERP = \left[\frac{P_j - \sum_{i=1}^n a_{ij}P_j - \sum_{r=1}^m x_{rj}P_j}{\frac{P_j}{1+t_j} - \frac{\sum_{i=1}^n a_{ij}P_j}{1+t_i} - \frac{\sum_{r=1}^m x_{rj}P_j}{1+t_i}} \right] - 1$$

The degree to which non-traded inputs influence effective protection depends on how their prices change as a result of tariffs or other trade policies. However, it is not very clear how protection affects the price of non-tradables. If non-traded inputs use traded inputs in their production, which are subject to protection, then their prices will increase. Also, because traded goods are consumed in their own right, protection can place upward pressure on their prices by way of expenditure-switching effects. Further, since non-traded goods are inputs into traded goods, there will be changes in demand for their use as resources are reallocated from declining to expanding industries. Depending

on substitution possibilities, this effect can be positive or negative. The procedure we adopt in this report follows a commonly used approach to non-tradables. We treat non-traded inputs as if they were traded inputs subject to a zero tariff. This approach, called the Balassa procedure, will tend to overstate ERPs somewhat if the price of non-traded goods increases as a result of protection.

Third, the ERP equation above assumes that tariffs are the only operative form of trade restriction. In practice, other types of trade restrictions, like quantitative restrictions, will influence the extent to which domestic value-added exceeds world value-added. These and other trade barriers can be factored into the analysis, if they are being used to control trade flows.

Fourth, there are two basic forms of ERP. The most common form uses the actual exchange rate in the calculation procedure. A second form, the net effective protection rate, adjusts the ERP to take account of any over or under-valuation of the exchange rate in the measurement of protection. Lastly, in practice, effective protection to domestic producers is measured by the extent to which it allows producer ex-factory price to be increased above the CIF price of the imported equivalent. To make such comparisons, one needs to identify a specific time period for which production costs and the CIF price of imports are obtained. This assumes that the tariff can be fully passed on to consumers, which in Africa is probably not a bad assumption considering the limited competition in many industries.

Making a comparison of ERPs over the period of the Economic Recovery Program requires “before” and “after” data. Ideally, one would want data for the early 1980s to calculate ERPs at the start of the recovery program and data for the early 1990s to compare ERPs about a decade later after the reforms were completed. Unfortunately, the RPED firm-level data used in this study is available only for the early 1990s. To make comparisons with earlier years, we must rely on other studies which estimated effective protection for the World Bank in 1983¹ and 1987.² These studies used a similar

¹ World Bank (1985). Ghana: Industrial Sector Review.

² Plan Consult (1991). “Kind and Level of Protection Required by Local Industries.” Prepared for the Ministry of Industries, Science and Technology, Government of Ghana.

method to the one described in this paper to calculate ERPs and thus allow us to make comparisons of the magnitude and variance of effective protection across the years.

The data for the calculation of ERPs in the early 1990s come from a longitudinal survey of 200 randomly-selected manufacturing firms conducted in the years 1991, 1992 and 1993, as noted earlier. Four sectors were included in the surveys — food processing, textiles and garments, metal working, and wood working. The entire size distribution of firms was included in the sample; hence, data is available from firms ranging in size from less than 10 employees to more than 400 employees. In addition to this panel survey, a subsequent price survey was conducted to obtain information on prices of raw materials and final products, as well as detailed input-output coefficients.

Results

We begin with the most recent situation. Effective rates of protection for 1993 are reported in Tables 2 and 3. Turning first to product specific ERPs in Table 2, the overall level of effective protection in 1993 averaged just 25 percent, a level which is relatively low for developing countries as we will see in a subsequent section of this report. Inter-product variation in rates is also relatively low. Maximum recorded effective rates of protection are 56 percent in grain milling, 34 percent in clothing, and 31 percent in food processing of fruits and vegetables. At the low end of the spectrum, miscellaneous metals manufacturing, ropes and nets, and agricultural machinery had average rates of protection of 15.7 percent, 10.7 percent, and 10.1 percent, respectively. There were no recorded cases of negative average protection within a product category. As we will see, however, cases were found where individual firms had negative protection, indicating a competitive disadvantage of the activity. It should also be noted that there is evidence suggesting a considerable amount of smuggling in products such as clothing and food stuffs. Depending upon the amount of money smugglers must pay to bring the goods across the border, smuggling greatly reduces actual effective protection. Unfortunately, we do not have systematic data on smuggling to assess the magnitude of the problem.

Table 2
Average Effective Rates of Protection by Four-Digit Manufactured Products, 1993

<i>Industry</i>	<i>ERP (Percent)</i>
3112 Dairy	29.1
3113 Fruits/Vegetable Products	31.3
3114 Grain Milling	55.9
3215 Rope, Nets, etc.	10.7
3220 Clothing	34.3
3310 Wood Products	26.3
3311 Sawmills, Logs, etc.	30.9
3320 Wood Furniture	29.9
3812 Metal Furniture	14.6
3813 Building Materials (Structural Metal)	20.6
3819 Miscellaneous Metal	15.7
3822 Agricultural Machinery	10.1

Source: RPED Surveys

The inter-sectoral pattern of protection is shown in Table 3. The highest levels of sectoral protection are found in food processing and in clothing, as would be expected from the product-specific rates of protection. Overall protection seems to favor slightly, if at all, those sectors where Ghana has some comparative advantage, as indicated by studies of domestic resource cost (see Footnote No. 8 of this report, page 19, for DRC information). Food processing and wood processing are labor intensive activities that require relatively low industrial skills and use a high proportion of local resources in their manufacture. These sectors generally represent early stage leading industries in most developing countries. With the exception of this slight bias, the structure of trade protection in Ghana appears relatively neutral in its impact across sectors. Therefore, no strong presumption can be made that today productive resources are being pulled away from some activities and pulled toward others by trade protection.

Because most effective protection studies have to rely on fairly aggregated input-output data, it is generally not possible to say much about the intra-sectoral pattern of protection. The calculations of ERPs in this study, however, are based on firm-level data covering the whole size distribution of existing firms; hence, we have a rare opportunity to comment on the pattern of protection across firms.

Table 3
Average Effective Rates of Protection
by Three-Digit Manufacturing Industries, 1993

<i>Industry</i>	<i>Median ERP1993</i>	<i>MEAN ERP1993</i>	<i>Standard Deviation</i>	<i>Minimum</i>	<i>Maximum</i>
311 Food Processing	33.8	29.9	(17.4)	-9.6	55.9
321 Textiles	10.1	10.7	(8.7)	-3.4	26.9
322 Clothing	31.5	34.3	(7.6)	27.8	45.0
331 Sawmills	27.9	29.3	(3.3)	26.3	33.9
332 Furniture	29.2	29.8	(2.8)	26.4	33.8
381 Metal Working	10.8	16.8	(11.7)	-3.4	41.6

Source: RPED Surveys

There is no strong presumption that protection within a sector should be uniform, particularly in developing countries where firms often exist with large differences in technologies and where a range of nominal tariffs and other trade restrictions may apply to differentiated products. As we can see from Table 3, the intra-sectoral range of rates in Ghana is wide in some cases — ranging from -3.4 percent to 41.6 percent in the case of metal working, and -9.6 percent to 55.9 percent in the case of food processing, for example. Also, as the firm-level ERPs indicate, some firms in the metal working industry, in textiles and in food processing are being disprotected. But the range of protective rates (and the magnitude of disprotection) across firms in these sectors is modest. Only in the cases of food processing and metal working, where the widest ranges are found, could one make an inference of potential intra-sectoral resource pulls.

One can also examine differences in effective protection by particular categories of firms — for example, exporters versus non-exporters, or importers of raw materials versus firms which use local raw materials. The results of these comparisons are presented in Table 4. One finds that mean values of protection are very similar across each of the categories, and the median values differ only modestly. This indicates that effective protection rates play only a marginal role in influencing firm decisions to enter world markets.

Table 4
Effective Protection Rates: 1993
By Export And Import Categories

<i>Category</i>	<i>Median ERP1993</i>	<i>MEAN ERP1993</i>	<i>Standard Deviation</i>	<i>Range of ERPs</i>	
				<i>Minimum</i>	<i>Maximum</i>
Exporting Firms	27.9	26.7	(7.7)	-3.4	33.9
Non-Exporting Firms	27.8	24.0	(13.6)	-9.6	55.9
Importers	33.8	28.0	(15.9)	-3.4	55.9
Non-Importers	26.5	22.9	(10.7)	-9.6	41.6

How do these relatively low and rather uniform rates of protection observed in 1993 measure up against the rates found at the beginning of the government's Economic Recovery Program? One would expect that, after all the announced trade reforms, the structure of incentives at the firm level would have changed significantly. Table 5 compares trends in rates of protection over the decade since the start of the Economic Recovery Program.³

In 1983, ERPs reflect three types of protection instruments: applicable tariff rates, quantitative restrictions and price controls. As the figures indicate, there was an extraordinarily large variance in inter-sectoral protection ranging from -50.5 percent for metal working to 305.1 percent for clothing. Most of this variation is caused by quotas and price controls. If tariffs and taxes had been left to determine domestic value-added in 1983, the structure of effective protection would have been tightly grouped around 30-50 percent, with somewhat higher rates for products whose outputs, but not inputs, were subject to special 20 percent sales taxes.⁴ When we include the effects of quotas and price controls in the 1983 ERP calculations, 43 percent of Ghana's industries received negative protection and 16 percent received more than 100 percent protection, according to World Bank estimates. In addition, several industries were operating at negative value-added.

Table 5

³ As we stated earlier, the estimates of ERPs for 1983, 1987 and 1990 were taken from earlier studies conducted for the World Bank. Details of the methodologies for these studies are provided as appendices in the respective reports. The basic approach in each was similar in all respects to the methodology used in this study. To incorporate exchange rate distortions and quantitative restrictions, the ERP formula used in these studies was modified slightly.

⁴ See World Bank Industrial Sector Review (1985), pg. 10.

Comparison of Effective Rates of Protection by Three-Digit Industry, 1983-1993

<i>Industry</i>	<i>ERP1983^a</i>	<i>ERP 1987 (Plan Consult)^b</i>	<i>ERP 1987 (John Short)^c</i>	<i>ERP 1990, est. (Plan Consult)^b</i>	<i>ERP1993^d</i>
311 Food Processing	-30.7	81	116	54	29.9
321 Textiles	148.2	n/a	293	75**	10.7
322 Clothing	305.1	150	148	110	34.3
331 Sawmills	-14.8	59	134	47	29.3
332 Furniture	10.2	108	n/a	44	29.8
381 Metal Working	-50.5	152	168	34	16.8

Source: ^aR. Filmer (1984). "Protection and Resource Allocation in Ghana." Background Paper for the World Bank Ghana Industrial Sector Review, 1985.

^bPlan Consult (1991). "Kind and Level of Protection Required by Local Industries." Prepared for the Ministry of Industries, Science and Technology, Government of Ghana.

^cJohn Short Economic Services (1989). "Ghana — Domestic Resource Costs and Effective Rates of Protection: Analysis of the MIST Survey."

^dRPED Surveys.

The large share of activities with negative effective protection in 1983 was caused by the fact that factory gate prices were controlled, while at the same time firms had to pay a premium to purchase inputs on the local market because they could not obtain import licenses or foreign exchange to import inputs directly. Thus, price controls and quantitative restrictions often had a strong negative impact on the incentive to produce. Also, since price controls were based on the cost of production, the amount of protection provided rose automatically with cost, thereby rewarding high-cost producers and providing no incentive to compete by way of cost cutting.

As the comparative protection rates in Table 5 indicate, abolishing price controls, lifting quantitative restrictions, and reducing the parallel market premium on foreign exchange had a significant impact. By 1987, although protection was still high, the abolition of price controls and several quantitative restrictions had reversed the highly negative incentives to production in many sectors. With the total abolition of the licensing program in 1987, together with a further decline in the parallel market premium, effective rates of protection dropped even more. By 1990, effective protection on average was about 50 percent of its 1987 level, and inter-sectoral variance in rates was much more uniform. Further reductions in ERPs were realized in the early 1990s through reductions in special taxes on imports and lower tariff rates.

Ghana's Post-Reform Structure of Protection by International Standards

By international standards, Ghana's 1993 structure of trade protection manufacturing appears low. Table 6 presents some evidence on effective protection for various periods in developing and newly industrializing countries. While not being strictly comparable in time, these international estimates do indicate that Ghana's current protective structure is relatively low and also quite neutral in comparison to the historical protective structures found in other developing countries. Ghana's average effective protection and range of protection look more like the trade policy structures found in the NICs in the late 1960s. Certainly, in Africa today, Ghana's manufacturing trade regime is among the most open.

Table 6
Comparison of Average Effective Rates of Protection (EPR)
in Ghana versus other LDCs and NICs

<i>Country</i>	<i>Year</i>	<i>Average EPR</i>	<i>Range of EPRs</i>
Ghana	1993	25	7-39.4
Brazil	1958	108*	17-510
Brazil	1963	184*	60-687
Brazil	1967	63*	4-252
Pakistan	1963-4	356*	-6-595
Pakistan	1970-1	200*	36-595
Korea	1968	-1*	15-82
Uruguay	1965	384*	17-1,014
Columbia	1969	19*	-8-140
Chile	1967	175*	-23-1,140
Indonesia	1971	119*	-19-5,400
Thailand	1973	27*	-48-236
Tunisia	1972	250*	1-737
Côte d'Ivoire	1973	41*	-25-278
Korea	1968	10	-67-164
Israel	1968	76	-943-750
Singapore	1967	6	-1-86
Taiwan	1969	46	-18,728-89
Argentina	1969	94	-596-1,308
Colombia	1969	46	-51-215
Brazil	1980-1	46	-16-97
Pakistan	1980-1	60	-799-1,543
India	1968-9	n/a	27-3,354
Mauritius	1980	55	2-300
Madagascar	1983	156	-93-852

Source: David Greenaway and Chris Milner (1993). *Trade and Industrial Policy In Developing Countries: A Manual of Policy Analysis*. Basingstoke: Macmillan, Table 5.4, Page 96.

Firm Responses to Trade Liberalization

What have firm responses been to these large changes in incentives over the last decade? Consider first what we would expect to observe. To begin, one would expect that the successful exchange rate reform and the lifting of exchange controls would help firms to raise capacity utilization over the period by encouraging exports from underutilized plants and by providing the foreign exchange for essential imported raw materials. Liberalization of quantitative restrictions on essential imported inputs should also help firms to reduce excess capacity. Second, one would expect reductions in effective protection to increase competitive pressures, which, in turn, should induce firms to improve productivity. However, as research in other reforming countries has shown, there should be no general presumption that trade liberalization will *automatically* lead to increases in technical efficiency.⁵ Third, one would expect changes in inter-sectoral variation in protection to stimulate a reallocation of resources towards sectors with greater comparative advantage. Fourth, one would expect reductions in anti-export bias to induce a reallocation of resources away from domestically-oriented activities towards exporting activities. And, finally, fifth, one would expect wasted resources to be freed up by a decline in rent-seeking activity as the import license regime is dismantled. What, in fact do the available empirical data tell us about the validity of these conjectures?

It is clear from the available economic data on Ghana's growth performance over the last decade that the country's overall growth response to the Economic Recovery Program has been positive. However, overall performance has been more modest than expected. Growth rates of GDP did rise in the late 1980s, but the expected dramatic increases in manufacturing investment and exports have yet to materialize. The discussion which follows reviews the available data on manufacturing performance and examines several hypotheses put forth to explain the observed supply response.

⁵ (a) Dani Rodrick (1992). "Closing the Technology Gap: Does Trade Liberalization Really Help?" in G. Helleiner, ed. *Trade Policy, Industrialization and Development: New Perspectives*. Oxford: Clarendon. (b) James Tybout (1992). "Linking Trade and Productivity." *World Bank Economic Review*, 6(2).

Growth in Manufacturing Output and Value-Added

According to the 1995 Ghanaian Census of Manufacturing, real manufacturing output grew 106 percent (and real value-added grew 103 percent) in the period 1987 to 1993.⁶ This amounts to an annual compound real rate of growth of about 10 percent over the seven years following the dismantling of Ghana's trade restrictions. Although output grew from a very low base, this recorded rise in the rate of growth of manufacturing indicates a substantial turnaround (one also suspects that these official figures are not very accurate and overstate growth). As we will see below, however, the growth of output and value-added (accurate or not) has mainly been driven by increases in capacity utilization, not growth in net investment or productivity.

The 1995 Census also records a structural shift in manufacturing value-added since 1987, with non-ferrous metal basic industries' (aluminum) share declining substantially from 18 percent to 8 percent, and wood products' share rising sharply from 9 percent to 15 percent. Other leading sectors, like food, beverage and tobacco, and chemicals and petroleum refining, remained about the same. Since wood products are classified as one of Ghana's main manufactured exports, this structural shift indicates some reallocation of resources towards tradables.

Exports

Exports of non-traditional goods have risen substantially since 1987. In the period 1987 to 1996, exports valued in US dollars doubled. Most encouraging is the fact that, over this period, the non-traditional component of exports grew more than 500 percent, albeit from a very low base. By 1996, the share of non-traditional goods in total exports had grown from just 3 percent in 1987 to more than 10 percent. Export growth has also progressively picked up over the adjustment period: total exports grew 24 percent in the period 1987 to 1993, but grew 67 percent from 1993 to 1996. These increases in exports have resulted in a significant increase in Ghana's export share in GDP, which was about 17 percent in 1987 and is now 25 percent. All of this indicates a reduction in Ghana's policy-induced export bias.

⁶ Ministry of Industries, Science and Technology, Republic of Ghana (1995). *Report on the Survey of Medium and Large-Scale Manufacturing*. Accra.

Private Investment

Unfortunately, the private investment figures do not provide the same positive picture. After the reforms of the late 1980s, private investment picked up to about 8 percent of GDP in 1991. Thereafter, however, private investment slumped back to about 4 percent of GDP and remains there today. Direct foreign investment has picked up in recent years, but has yet to reach the level of its peak years of the mid-1970s.

The RPED surveys investigated investment levels of manufacturing firms in the 1991-1993 period.⁷ The observed rate of investment averaged only about 8 to 10 percent of the value of capital stock. Much of this investment was replacement investment, not net increases in capital stock. Considering that the vintage of plant and equipment in most companies is quite old, investment rates of this magnitude are likely to have very little impact on plant productivity. Moreover, only about 40 percent of manufacturing firms in the period made investments of any kind; so the impact on aggregate manufacturing was very small. This is borne out by the fact that growth in manufacturing real output per employee declined about 15 percent over the 1991 to 1993 period according to the RPED surveys.

An examination of the factors determining the decision to invest indicates that the most significant variables are the profits of the enterprise (current cash flow) and whether or not the enterprise exports. A variable measuring the confidence that entrepreneurs had in the future was correctly signed, but was not significant at conventional levels.

Employment

Overall employment growth in manufacturing has not done well either. Ghana's 1995 Census of Manufacturing, which measured employment in establishments with more than 20 employees, finds that from 1987 to 1993 total employment remained about the same. This is not good news for labor absorption, as over the same period population grew 23 percent. However, the manufacturing employment statistics do give some indication that labor resources are being reallocated, albeit slowly, toward lower domestic resource cost industries and toward tradables, one of the chief aims of the policy reform

program. The census indicates that the wood processing industry, for example, has increased its share in total employment more than 66 percent over the 1987 to 1993 period, while the share of non-ferrous metal basic industries' fell 55 percent, and the share of remaining industries stayed about the same.⁸

Considering that Ghana's manufacturing census includes only establishments with greater than 20 employees, it may not capture the behavioral responses of a large segment of the firm population. Average firm size in Ghana's manufacturing sector is about 30 employees, which indicates that a large number of small enterprises exist. In addition, the 1995 Census was based on a mail survey, from which the Ministry of Trade and Industry only received a 37 percent response rate.⁹ Hence, there are good reasons to believe that more activity may be occurring than was picked up by the official figures.

The RPED surveys conducted in 1991, 1992, and 1993 can be useful in providing additional employment information, as the sample includes firms of all sizes. Tables 7,8, 9 and 10 report the results of an examination of employment in the RPED sample. In Table 7, the employment histories of firms that were in existence at the beginning of the Economic Recovery Program in 1983 are shown. Overall, firms that survived over the adjustment period have positive average growth rates.¹⁰ The highest growth rates of

⁷ For details see *The Ghanaian Manufacturing Sector 1991-1993: Findings from Waves 1 to 3* — RPED Discussion Paper No. 55, December 1995, and *Technological Capabilities and Learning in African Enterprises* — World Bank Technical Paper No. 288, 1995.

⁸ Wood processing (wood products, wood furniture, etc.) is one of Ghana's chief exports. Estimates of domestic resource costs (DRCs) from several studies rank wood processing at a low 0.83 and non-ferrous metal basic industries at a high level between 2.4 and 7.8 (see table below).

DRCs 1987 Ghana		
	<i>John Short^a</i>	<i>Plan Consult^b</i>
Food Processing	0.89	1.25
Textiles	2.90	NA
Clothing	1.70	1.99
Saw Mills	NA	0.75
Furniture	NA	0.90
Metal Working	7.87	2.45

Source: ^aJohn Short Economic Services (1989). "Ghana — Domestic Resource Costs and Effective Rates of Protection: Analysis of the MIST Survey."

^bPlan Consult (1991). "Kind and Level of Protection Required by Local Industries." Prepared for the Ministry of Industries, Science and Technology, Government of Ghana.

⁹ See pg. 2 of Ministry of Industries, Science and Technology, Republic of Ghana (1995). *Report on the Survey of Medium and Large-Scale Manufacturing*. Accra.

¹⁰ As we have no information on exiting firms over the period, we, of course, can say nothing about increases or decreases in total manufacturing employment.

survivors is recorded in the years 1988-91 just after the liberalization of quantitative restrictions. Thereafter, average employment growth rates appear to settle back down to those found in the pre-liberalization years.

Similar to the employment figures in the 1995 Manufacturing Census, RPED data indicate high rates of growth in wood processing and wood furniture, which are tradable sectors in Ghana. Textiles and garments show signs of significant employment downsizing, with textiles being hit very hard just after liberalization in 1987. Metal working in the RPED sample does not include the non-ferrous metals industry shown in the Manufacturing Census. Most RPED metal working firms are small to medium operators producing consumer goods, such as metal gates, cookware or wire nails. Growth in these small-scale activities has been vigorous.

Table 7
Average Employment over Structural Adjustment Period
Old Firms: 1983-1993

	<i>Total</i>	<i>Food Proc.</i>	<i>Textile</i>	<i>Garments</i>	<i>Wood Proc.</i>	<i>Furniture</i>	<i>Metal Working</i>
Avg. Empt. 1983	50 (68)	61 (83)	38 (25)	49 (69)	86 (68)	54 (93)	38 (39)
Avg Empt. 1988	63 (99)	68 (95)	63 (54)	36 (43)	98 (60)	53 (70)	91 (160)
Avg. Empt. 1991	68 (108)	91 (158)	22 (11)	31 (27)	99 (55)	63 (82)	82 (126)
Avg Empt 1993	71 (101)	78 (119)	23 (8)	22 (8)	114 (75)	71 (88)	86 (129)
Avg. Growth 83-88	.04 (.13)	.018 (.06)	.08 (.06)	.02 (.11)	.03 (.07)	.06 (.20)	.08 (.13)
Avg. Growth 88-91	.11 (.25)	.06 (.14)	-.29 (.16)	.05 (.21)	.08 (.17)	.25 (.33)	.12 (.26)
Avg. Growth 91-93	.03 (.29)	-.02 (.15)	.03 (.09)	-.12 (.45)	.01 (.14)	.09 (.22)	.08 (.32)

Standard deviations are in parentheses.

Source: RPED Surveys

Table 8 reports the employment histories of firms which entered after the Economic Reform Program started in 1983. On the whole, these “new firms” are smaller on average than the older, pre-adjustment firms. The data indicate that average employment growth rates are positive for these firms in all sectors, with the exception of textiles and garments. The tradable sectors again recorded the highest average growth rates, however, these tradables firms generally grew from a smaller average base. In terms of employment growth, these smaller, newer firms outperformed their larger rivals

in all sectors, even after controlling for the effect of growth from a small base. This is, of course, to be expected, as small firms are generally found to grow faster than larger firms in all countries.¹¹

Table 8
Employment Patterns:
New Firms during Structural Adjustment

	<i>Total</i>	<i>Food Proc.</i>	<i>Textile*</i>	<i>Garments</i>	<i>Wood Proc.</i>	<i>Furniture</i>	<i>Metal Working</i>
Avg. Empt. at Start	21 (50)	13 (17)	15	66 (128)	13 (11)	3 (2)	23 (41)
Avg. Empt. in 1991	42 (86)	17 (25)	56	70 (126)	32 (32)	16 (14)	74 (141)
Avg Empt. in 1993	48 (85)	40 (78)	39	40 (65)	61 (84)	24 (19)	75 (141)
Growth: start to 1991	.24 (.29)	.03 (.07)	.15	.51 (.45)	.20 (.13)	.37 (.32)	.23 (.24)
Growth: 1991- 1993	.08 (.44)	.29 (.52)	-.18	-.18 (.31)	.35 (1.06)	.24 (.34)	.02 (.42)

*Only one observation.

Standard deviations are in parentheses.

Source: RPED Surveys

Examining employment growth by firm size-class for old firms and new firms in Tables 9 and 10, we see that for the old firm cohort as well as the new firm cohort employment increases have been concentrated in the smallest size classes. This employment growth would not have been picked up by the 1995 census and thus may indicate some underestimation of employment change over the period (however, we do not have information on the exits to really make sure). The most established large firms have not performed well over the adjustment period in terms of employment growth. They seem to be downsizing, perhaps to increase efficiency, during the adjustment period. In terms of startups after liberalization, we see that most of the new entries have been in the smallest size classes (80 percent of new entrants were in the size class with fewer than 20 employees).

Table 9
Average Employment Growth Over Structural Adjustment Period by Size Class —
Old Firms : 1983-1993

¹¹ (a) Evans, David (1987). "The Relationship between Firm Growth, Size and Age: Estimates for 100 Manufacturing Industries." *Journal of Industrial Economics*. (b) Hall, Bronwyn (1987). "The Relationship between Firm Size and Firm Growth in the U.S. Manufacturing Sector." *Journal of Industrial Economics*.

	<i>Total</i>	<i>Size83= 1</i>	<i>Size83=2</i>	<i>Size83= 3</i>	<i>Size83= 4</i>
Avg. Empt. 1983	50 (68)	5 (4)	30 (8)	60 (9)	183 (55)
Avg Empt. 1988	63 (99)	7 (6)	42 (29)	79 (30)	225 (145)
Avg. Empt 1991	68 (108)	14 (11)	44 (33)	71 (44)	234 (176)
Avg Empt 1993	71 (101)	18 (17)	56 (65)	81 (55)	215 (154)
Avg. Growth 83-88	.04 (.13)	.05 (.13)	.04 (.12)	.04 (.07)	.01 (.15)
Avg. Growth 88-91	.11 (.25)	.28 (.27)	.02 (.13)	-.08 (.18)	-.01 (.17)
Avg. Growth 91-93	.03 (.29)	.08 (.28)	.03 (.34)	.07 (.20)	-.12 (.30)
N	68	26	19	8	11

Standard Deviations in parentheses.

The size groups are classified as follows: 1 <20 employees; 2 >= 20 and less than 50 employees; 3 >= 50 and less than 100 employees; 4 >= 100 employees;

Source: RPED Panel Surveys

Table 10
Employment Patterns: New Firms During Structural Adjustment
Classified by size at start

	<i>Total</i>	<i>Sizest=1</i>	<i>Sizest=2</i>	<i>Sizest=3*</i>	<i>Sizest=4</i>
Avg. Empt. at Start	21 (50)	4 (4)	31 (12)	75	195 (91)
Avg. Empt. in 1991	42 (86)	17 (30)	45 (22)	75	345 (121)
Avg Empt. in 1993	48 (85)	20 (32)	94 (83)	122	283 (206)
Growth: start to 1991	.24 (.29)	.27 (.30)	.05 (.11)	0.0	.30 (.42)
Growth: 1991- 1993	.08 (.44)	.07 (.47)	.25 (.31)	0.24	-.16 (.22)
N	33	26	4	1	2

Standard Deviations in parentheses.

*Only one observation

The size groups are classified as follows: 1 <20 employees; 2 >= 20 and less than 50 employees; 3 >= 50 and less than 100 employees; 4 >= 100 employees;

Source: RPED Panel Surveys

Productivity

One of the central aims of trade policy reform in Ghana was to stimulate a rise in manufacturing productivity.¹² It was presumed that productivity would rise via traditional

¹² See for example "Ghana: Industrial Policy, Performance and Recovery," World Bank Report No. 5716-GH, 1985.

comparative advantage effects and via increases in technical efficiency. Changing relative prices would induce resource shifts toward more efficient sectors, improving allocative efficiency, and technical efficiency would improve as larger and more competitive markets induced firms to produce at more efficient scales and achieve higher outputs from their given input bundles. In addition, as a consequence of exchange rate reforms and removal of quantitative restrictions, average capacity utilization would rise as producers gained better access to strategic inputs, further stimulating productivity improvements. What do the available data tell us about technical efficiency improvements in Ghanaian manufacturing after 1983?

Table 11
Average Capacity Utilization In Ghanaian Manufacturing: 1978-1993

	1983 ^a	1987 ^b	1991 ^c	1993 ^c
Food Processing	25.0	42.0	52.2	55.9
Beverages	65.0	37.0	35.0	41.6
Textiles	16.0	29.0	68.0	75.0
Garments	25.0	30.0	55.7	47.6
Wood Processing	20.0	58.0	56.4	54.4
Furniture	20.0	25.0	53.0	49.0
Metal Working	55.0	52.0	50.8	56.0

Note: Most textile firms have exited, we have only two firms in the sample with high rates of capacity utilization during the sample period. These firms are producing things like fishing nets.

Source: ^aQuarterly Digest of Statistics, 1983, 1984

^bPlan Consult (1991). "Kind and Level of Protection Required by Local Industries." Prepared for the Ministry of Industries, Science and Technology, Government of Ghana.

^cRPED Panel Surveys

Consider first the evidence on capacity utilization over the adjustment period. Information from several sources allows us to track average manufacturing capacity utilization from 1983 to 1993. Table 11 reports on these data. In 1983, average capacity utilization was very low, averaging about 30 percent. Access to imported spare parts and critical raw materials was severely restricted by exchange controls and import licenses in 1983 and these trade policies constrained plant capacity utilization. Throughout the adjustment period, as trade controls were dismantled, average capacity utilization rose steadily to an average of 40 percent in 1987, 53 percent in 1991 and 55 percent in 1993. This rise in plant utilization should have had a positive effect on productivity.

In addition to changes in capacity utilization, there is evidence in the 1991-1993 RPED survey data that firms were responding in other ways to the relative price changes arising from the reforms.¹³ Input mixes were changing and firms were shifting into new products. In some cases, firms were exiting the market and starting up businesses in other sectors. Machinery and new plant investments were also being made, as we indicated earlier. There is also evidence of substantial increases in new firm entry in some sectors, particularly in the small enterprise segment of the firm population.

Did these firm responses over the adjustment period have produce any significant increase in productivity? To investigate the issue of productivity change, we constructed a firm-level data set spanning the years 1985 to 1993. This time period covers the years before the large changes in commercial trade policies in 1987 and extends to roughly six years of adjustment thereafter. The data for this analysis come from two sources. In the years 1985 and 1986, as we noted earlier, enterprise surveys were conducted by the World Bank in Ghana to estimate effective rates of protection and calculate domestic resource costs.¹⁴ We used the estimated ERPs from these data to construct Table 5. These earlier studies covered all of Ghana's manufacturing sectors and include detailed information on enterprise costs and revenues. The sample of enterprises interviewed in these surveys was chosen from a population of larger firms with employment greater than 30 employees. For the purposes of our productivity analysis, we selected 125 firms from this earlier data set, operating in food processing, textiles and garments, wood processing, and metal working, to match up with firms from our second source of data, the 1993 RPED

¹³ See the following RPED country reports: (a) RPED Paper No. 003: *First Report on the Ghana Pilot Survey*. Center for the Study of African Economies — University of Oxford and the University of Ghana, February 1993; (b) RPED Paper No. 029: *The Ghanaian Manufacturing Sector 1991-1992: Findings of Waves 1 and 2*. Center for the Study of African Economies — University of Oxford and the University of Ghana, August 1994.; (c) RPED Paper No. 013: *Economic Reform and the Manufacturing Sector in Ghana.(Round I)*. Edited by Amoah Baah-Nuakoh, Department of Economics, University of Ghana and Francis Teal, Centre for the Study of African Economies, University of Oxford, August 1993; (d) RPED Paper No. 027: *The Ghanaian Manufacturing Sector in 1991 and 1992: Firm Performance and Growth: A Second Preliminary report on Wave I and II of a Panel Data Survey*; Francis Teal, Centre for the Study of African Economies, University of Oxford, June 1994; (e) RPED No. 031: *The Ghanaian Manufacturing Sector 1991 - 1992 Findings of RPED Survey Waves I and II*, Centre for the Study of African Economies, University of Oxford, Department of Economic, University of Ghana, August 1994; (f) RPED Paper No. 055: *The Ghanaian Manufacturing Sector 1991-1993: Some Findings from Waves 1 to 3*. Center for the Study of African Economies — University of Oxford and the University of Ghana, December 1995.

¹⁴ These data were obtained from John Short Economic Services of the United Kingdom, the company which conducted the surveys.

survey. From the RPED survey data, we selected firms with employment-size greater than 30 employees in 1993. Many of these firms were the same firms interviewed in the earlier 1985/86 studies. All these relevant data are deflated over the period by the CPI.

We investigate firm productivity growth between the two periods by estimating a Cobb-Douglas production function, corrected for heteroscedasticity. A dummy variable, D_{93} is added to the estimating equation to examine structural shifts in the function between the periods.¹⁵

In logarithmic form, the estimated equation is:

$$\ln(VA_{it}) = \alpha + \beta \ln(L_{it}) + \gamma \ln(K_{it}) + D_{93} + \varepsilon_{it} \quad (1)$$

where (VA) is value added, (L) is labor services (measured by the wage bill), (K) is capital (measured by the replacement cost of capital), D_{93} captures exogenous productivity changes, the error term is denoted by (ε) and i and t represent firm and time, respectively. The regression results are reported in Table 12.

¹⁵ Other specifications examining differences in scale, and controlling for endogeneity and capital measurement problems, were also tried. Due to a lack of any good instruments, however, results were not robust.

Table 12
Estimates of Productivity Change 1985/86 to 1993

	<i>Specification I</i>	<i>Specification II</i>
Constant	2.13* (.44)	1.8* (.44)
Log(Labor)	.74* (.07)	.73* (.07)
Log(Capital)	.15* (.05)	.16* (.04)
D ₉₃	.05 (.19)	
EXIST		.44** (.23)
Adjusted Rsq	.69	
N	250	250

Standard Deviations in parentheses.

* Significant at 5 percent or less level of significance.

** Significant at 10 percent or less level of significance

The size groups are classified as follows: 1 <20 employees; 2 >= 20 and less than 50 employees; 3 >= 50 and less than 100 employees; 4 >= 100 employees;

Source: RPED Panel Surveys

The estimated regression in Table 12 explains about 70 percent of the variance in value added. Although the sum of the estimated coefficients on capital and labor is less than one, implying decreasing returns to scale, we could not reject the hypothesis of constant returns. This is consistent with much of the literature on developing countries, which finds no evidence for large unexploited economies.¹⁶

In terms of productivity change over the period, the results indicate no significant overall improvement in firm efficiency between 1985/96 and 1993. The coefficient of the dummy variable, D₉₃, is positive but not significant. Thus, while trade reform may have induced economy-wide increases in allocative efficiency, our results appear to indicate that significant technical efficiency gains have not materialized in manufacturing firms. The data we have, however, may not be sufficient to make strong judgements about efficiency improvements over the period. Unfortunately, we do not have time-series data

¹⁶ See (a) Tybout, J. and Westbrook M.D. (1996). Chapter 5 of Roberts, M. and Tybout J. (eds.). *Industrial Evolution in Developing Countries*. New York: Oxford University Press.; (b) Fikkert, B. and R. Hasan (1997). "Returns to Scale in a Highly Regulated Economy: Evidence from Indian Firms" (Forthcoming). *Journal of Development Economics*.

on firms over the relevant years. Rather, we are relegated to measuring productivity differences between small, independent cross-section samples in two time periods.

In order to investigate the productivity issue further, we collected some additional information on firms in the 1985/86 data set. The history of each firm was examined to see whether it had survived over the next seven or eight years to 1993.¹⁷ Using this information on firm exits, and treating the 1993 RPED sample as survivors, an additional specification was investigated to see if productivity levels were higher for firms that survived than productivity levels for firms which exited.

Specification II in Table 12 estimates the same Cobb-Douglas production function as in the first specification, but now includes a dummy variable, *EXIST*, which captures the productivity differences between surviving and exiting firms over the 1985/86 to 1993 period. The results indicate that productivity is significantly higher for surviving firms. Therefore, it appears that the reforms did have an impact on the firm “selection environment.” Inefficient firms over the period appear to have been driven from the market in favor of more efficient firms. This efficient selection process should have had a positive effect on overall technical efficiency. However, the magnitude of this impact cannot be ascertained.

Conclusions

We have shown that trade reform in Ghana has had a significant impact on firm-level incentives. The level and variance of effective protection over the reform period declined to an average of about 25 percent by 1993 with very low dispersion across sectors. International comparisons of protection in developing countries indicate that Ghana’s average level of protection (and variance) in the early 1990s was lower than it had been historically for other countries at similar stages of development.

Assessing the firm response to these changes in incentives is difficult because we do not have detailed firm-level data covering the period of adjustment. However, using recent enterprise survey data, combined with data from previous studies on effective

¹⁷ This information was kindly provided by the Ministry of Industry, Science and Technology, Accra, Ghana.

protection in the mid-1980s, we are able to put together a picture, although somewhat blurred, of enterprise response to the new structure of prices.

First, survey data indicate that there has been a positive supply response in manufacturing and in manufactured exports over the reform period. There also is evidence of significant resource shifts toward comparative advantage economic activities, lending support to the conclusion that overall allocative efficiency is improving, albeit slowly. Notwithstanding these positive responses, however, there does not appear to have been a significant improvement in technical efficiency, although the evidence is somewhat cloudy here. The firms in the sample which survived over the adjustment period do seem to have realized modest gains in efficiency.

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