Does 'Getting Prices Right' Work? Micro Evidence from Ghana

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Abstract: The question posed in this paper is whether structural adjustment programs have had the consequences policy intended and theory predicts. It uses evidence from a micro survey of manufacturing firms in Ghana to assess whether policy has effected an expansion of the exportable sector within manufacturing, the growth of small firms and an increase in exports and investment. It is argued that, where policy has been implemented, it has succeeded. The failure of exports and investment to grow rapidly are due to the very partial implementation of the policies of price reform.

1. Introduction

Possibly the issue that has been most contentious in development economics in the last ten years has been the dispute as to how far "getting the prices right" is the key to successful economic policy in Sub-Saharan Africa. There is probably now little disagreement that getting certain prices wrong, of which the exchange rate would be the most uncontentious candidate, can prevent policy working successfully. There would also be widespread agreement that an "outward orientation" policy is a key element in success, as are policies to subsidise education and infrastructure. In the language of World Bank reports, in which much of the current consensus appears, better markets and better governments are both crucial ingredients for successful development policy[1].

However beyond such generalities there is little agreement. The major area of dispute has centred on the role of structural adjustment in Sub-Saharan Africa. The World Bank has argued that policy reform, as set out in structural adjustment programs, has been effective in promoting growth; critics of the World Bank have disputed this view, for example, Mosley and Weeks (1993) and Mosley, Subasat and Weeks (1995). The evidence has hinged on macroeconomic data and frequently qualitative assessment of policy. Mosley, Subasat and Weeks (1995, p.1470) in qualifying their own cross-country regressions, note that:

> "in principle it would be highly desirable to complement the approach taken here with micro-modelling of individual African countries".

It is the purpose of this paper to present such microeconomic evidence.

The data relates to Ghana's manufacturing sector. The Ghana economy has had one of the longest periods of structural adjustment reform of any economy in Africa and is regarded as one of the most successful of those economies. It appears to be an excellent case study for the view that "getting prices right" is the key to development economic success. Export growth has improved dramatically since the 1970s, with growth rates of 5% per annum over the period 1980-93 as compared with exports falling at the rate of 8% per annum over the period 1970-80, World Bank (1995). This greatly improved export performance could be attributed to the real exchange rate which, defined as the CPI deflated by the nominal exchange rate, appreciated 50 fold between 1970 and 1983, then fell 15 fold.[2] There are, however, reservations. Killick (1995, p. 101) summarises the Ghanaian experience of structural adjustment as one of clear overall improvement but a mixed record with the economy remaining aid-dependent. The response of investment is viewed as limited; while investment has grown rapidly the growth was from a low base so that by

[1] "The approach to development that seems to have worked most reliably, and which seems to offer most promise, suggests a reappraisal of the respective roles for the market and the state. Put simply, governments need to do less in those areas where markets work, or can be made to work, reasonably well....At the same time governments need to do more in those areas where markets cannot be relied upon." World Bank (1991, p.9)

[2] If the real exchange rate in 1970 is taken to be 100, the value in 1983 was 5,158 and in 1990 330.1. It will be noted that the real exchange rate in 1990 remains at three times its 1970 level. An alterative estimate of the real exchange rate is given in Jebuni, Oduro and Tutu (1994) who use unpublished IMF data which imply that if 1970=100 then 1983 is 878 and 1990 is 63.8. While the figures are quite different either calculation implies a massive real devaluation from 1983 to 1990.

1993 investment to GDP was estimated at 15%, the same as in 1970, World Bank (1995)[3]. Why, if relative prices have been shifted to correspond with world prices, has an investment boom not occurred? Two previous answers to this question are Aryeetey (1994) who, using macro data, argues that it is due to uncertainty, and Collier (1993) who uses the first wave of the RPED data to show that a measure of profitability is important both for the decision whether to invest, and for the amount of investment undertaken. For reasons explained below the first wave of the data is excluded from this paper. While manufactured exports have expanded greatly during the 1980s they were, in 1993, only 17% of total exports and remain very small compared with the far more rapidly growing economies of East Asia. On a per capita basis, Ghana's exports of manufactures were US$11 million in 1993, as compared with US$ 895 million for Korea, US$ 290.5 million for Thailand and US$ 64 million for Indonesia, World Bank (1995). Why, if the export market is now massively profitable (which would appear the obvious inference from the very large real devaluation) have labour intensive manufactured exports not grown more rapidly? Is one of the elements missing the successful industrial policy which is viewed as central to the success of the NICs, (Lall 1994)? In their discussion of the conclusions to be drawn from the Korean experience Pack and Westphal (1986, p.91) argue that:

> "trade considerations are secondary to technological ones in searching for an understanding of industrialisation that is relevant to policy making".

Micro evidence can address these issues in a way that is not possible with macro data.

In the next section the basic question is asked: have the reforms characterising structural adjustment in Ghana worked? We examine what would be expected of trade and financial reform for the manufacturing sector. We compare this predicted outcome with the results of a survey of Ghana's manufacturing sector. This survey comprises a three year panel of approximately 200 firms, varying in size from less than five to more than 100 employees. It is shown that in several respects the micro data mirror the macro. Both export and investment growth have been very limited. Section 3 argues that an explanation can be found in the failure to fully implement the policies of price reform. Section 4 examines alternative views as to the policies that will provide the missing growth. A final section concludes.

[3]How modest this investment figure is can be seen by a comparison with the investment rates which have underlaid the success of the NICs. "Capital input has grown rapidly in the NICs. Although the investment to GDP ratio has remained roughly constant in Hong Kong [at some 30%] in the other NICs it has risen substantially over time. In Singapore the constant price investment to GDP ratio, at 10% in 1960 had reached 39% by 1980 and an extraordinary 47% by 1984, after which it declined substantially, only to begin to rise again in the late 1980s. In South Korea, investment rates, which were around 5% (in constant prices) in the early 1950s, exploded to 20% in the late 1960s, reached 30% by the late 1970s and were approaching 40% by 1991. Finally, in Taiwan the constant price investment to GDP ratio, at around 10% in the early 1950s, grew steadily to a high of 27% in 1975, after which it fluctuated around a value of about 22%." Young (1995).

2. Has Structural Adjustment Worked in Ghana?

> "A structural adjustment program can be defined as a set of policy measures that attempts to permanently change relative prices of tradable to non-tradable goods in the economy, in order to reallocate, or help along reallocation of, production factors in accordance with the new set of external and domestic conditions." (Edwards and van Wijnbergen, 1989, p.1482).

In Ghana the two major policies were a trade reform to effect a real devaluation and fiscal reform linked to financial liberalisation.[4] The trade reform led to the real devaluation discussed above and, by 1992, had eliminated the premium on foreign exchange and removed most quota controls. A major reform of Ghana's financial sector was carried out in the late 1980s. In 1987 ceilings on interest rates were removed and from 1988 non-performing assets of the banking system were written off in an attempt to upgrade the financial system, Montiel (1995). In 1987 the deposit rate was 23.5% and the rate of inflation 40%; in 1992 the deposit rate had risen to 30% and the rate of inflation had fallen to 10%. In the period immediately preceding the survey interest rates had become positive in Ghana after a long period of substantial negative real interest rates.

In this section the question basic to the issue of price reform is addressed. What are the expected responses of the economy to trade and financial liberalisation and has the economy responded as price theory would predict? We have evidence only for the manufacturing sector but as that sector is viewed (by both proponents and opponents of structural adjustment policies) as an area of policy importance, it remains a valuable test case for theory. The trade reform part of a structural adjustment program should expand the tradable relative to the non-tradable sector and, within the tradable sector, expand exportables relative to importables. The financial reform should benefit relatively smaller firms and increase savings, leading to more investment and growth.

The data used in this paper is for the manufacturing sector. The sector in the survey which exported a substantial part of its output was the Wood sector. Two sectors faced very close competition from imports; one was the Garment sector, the other was the Textile sector. The other sectors which were included in the survey, Bakeries, other Food, Metal, Machinery and Furniture all make products which primarily compete with the products of other domestic firms. These firms are classified as belonging to the non-tradable sector. The object of the reform process was to enable the exportable sector to expand relative to other sectors. The effects on output in the non-traded sector are ambiguous. For many firms in the non-traded sector input costs will rise but, if domestic demand expands, they too may be able to expand output.

The second objective of the reform process, common to both the trade and financial reforms, was to remove the bias against small firms. The bias was asserted to take several forms, one was in the allocation of import licences, the second was in the access of the larger firms to subsidised credit from the banking sector. Trade reform to remove quota restraints, and financial reform to eliminate negative real interest rates, lead to lower prices for the output of import competing firms and higher capital costs for larger firms. Small firms, which have very limited access to the formal

[4]Seck and El Nil (1993), using macro data, argue that there is evidence that financial liberalisation in Africa has assisted growth.

capital market, would be only indirectly affected by the financial reforms.[5] An important example of a sector adversely affected by both trade and financial liberalisation is textiles, which has relatively large firms and was highly protected.

In summary, trade and financial reform had as its objective the expansion of the output of the exportable sector relative to others, the expansion of small firms relative to larger ones and increased saving leading to increased investment to exploit the newly opened trade opportunities. We now consider the evidence from the survey for each of these elements of reform in turn.

2.1 Growth of Value-added and Output by Sector

From the survey it is possible to see how firms within a sector were affected by the economic changes that have been implemented. Table 1 shows the percentage growth of value-added for the three broad sectors on which we wish to focus. The growth in value-added for all the sectors was 80% over the two years of the survey. In general, the most successful sector was the Wood sector - the major exporter within manufacturing. Value added for firms in this sector grew by 133%. The sector which competes most closely with imports, Garments, experienced a modest rise in nominal value added.[6] The average rise in value-added for the non-traded sector was 73% with the metal working sector experiencing a rise nearly as large as for the export sector. Over the period 1991 to 1993 the consumer price level rose by 37%, accelerating from 10% between 1991 and 1992 to 25% between 1992 and 1993. The high rates of inflation mean that there is some uncertainty in establishing whether real output has increased.

To investigate this issue further values of real output have been calculated and are shown in Table 2. The figures in Table 2 use the nominal value of output from the survey and deflate this by the component of the Consumer Price Index which is most relevant for the sector. The result is to change the perception of the relative roles of the garments and non-traded sector, while confirming that the export oriented sector has dramatically out-performed the other sectors. The real value of output of the wood sector grew by 38% over the two years of the survey. The survey shows that domestic oriented firms have increased the value of their output in real terms by 8%. Exporting firms have done much better than any other sector. It appears that the price reforms achieved exactly what a simple neoclassical model would have predicted. The exportable sector has been given a major boost relative to the non-traded, which has itself expanded but at only a modest rate.

2.2 The Growth of Firms

Steel and Webster (1991) conducted a survey of small sale enterprise in Ghana which found evidence that some firms had successfully adapted under structural adjustment. The data used in

[5]The relationship between formal and informal credit markets is complex. Bell (1990) provides an empirical investigation of the issue in the context of rural financial markets in India.

[6]The other sector which competes with imports is textiles. It is not shown in the table as there are only three observations over all three waves of the survey. For these three firms both value added and constant price output declined from 1991 to 1993.

this paper can extend their work as the RPED survey was not confined to small firms. Table 3 shows how the firms in the sample have grown. In the top part of the table we classify firms by their size at establishment. A large firm is one that employs more than 100 people; a medium firm employs between 30 and 100; a small firm from 5 to 30; while the micro firm has less than 5 employees. The top part of the table shows that firms which were large when they were established have, on average, fallen in size while at the other end of the size spectrum, micro firms have been able to grow quite rapidly.[7] The net result of this different pattern for large and micro firms is that, on average, firm size has approximately doubled from the time of formation to 1993. The data shows that larger firms have contracted while smaller firms have been able to grow. There is evidence from other sources that many large firms have gone out of business in recent years and that fact is consistent with the findings of the survey.

It might be objected that the relevant time period is not from the time the firms were founded to the present but from 1983 onwards, after the structural adjustment program was put in place. For this comparison our sample size is smaller but is shown in the bottom part of Table 3. The pattern is exactly the same as that shown in the upper half. It is only large firms which have seen a decline in their average size and the most rapid growth in size is concentrated in the micro firms. While micro firms grow to become small, neither micro nor small firms grow to become large, as defined for this survey. The growth of small relative to large firms is exactly the response that policy intended, and theory predicts.

2.3 Productivity and Investment

A major issue in the economic reform process has been the intent to make firms more efficient, in the sense of being able to compete in international markets. Indeed whether unaided price reform can do this is a central point of contention between the World Bank and its critics. It is possible to construct from the survey data measures of productivity, which are shown in Table 4, and measures of the rates of investment, which are given in Table 5. Two measures of labour productivity are shown in Table 4, value-added per employee and real output per employee, each covering the three years of the survey. For both measures there are wide differences between sectors. On average value-added per labourer increased by 20% over the two years of the survey while real output per employee fell by 16%.

Table 5 shows the ratio of the value of investment to the value of capital for each sector. It will be noted that the figures for 1991 are very low. The reason is that the survey for that year concentrated on major investments, as distinct from measuring all investment. It is the partial

[7]This evidence of rapid growth of micro firms is not consistent with the evidence provided in Mead (1994). Mead reports on the results of nationwide surveys of small enterprises in Botswana, Kenya, Malawi, Swaziland and Zimbabwe. These surveys find that most micro enterprises do not grow. They also find that most micro enterprises are located in rural areas, whereas all our firms are from urban localities. Our data is also subject to the limitation that, by construction, micro firms which have died are not part of the survey. It is, therefore, necessary to qualify the results by pointing out that while they show, as does the work of Steel and Webster (1991), that micro firms under structural adjustment **can** grow rapidly this should not be read as saying that most micro firms do grow rapidly.

coverage of investment in the first round of the survey that has led us to exclude it from the analysis of the determinants of investment reported below. The figures for 1992 and 1993 are more representative of how much firms have been investing. However, even using these numbers, the rate of investment in the Ghana economy is low, on average only about 10% of the value of the capital stock. We noted in the introduction that the average rate of investment for the Ghana economy was estimated as 15%. These survey figures for the manufacturing sector are wholly consistent with the macro data as it is clear from the expansion of the mining sector that investment in the non-manufacturing sector has expanded faster than investment in manufacturing.

The major findings that emerge from Tables 4 and 5 are that, far from policies leading to rises in productivity and a move to efficiency at international prices the opposite is happening - firm costs are rising; in part due to the failure to raise productivity through investment. It is here that the implications of the theories of trade reform seem most at variance with the micro data. The output of the exportable sector has grown, small firms have grown relative to large ones, but investment and productivity growth have not occurred.

3. Why Have Exports and Investment Not Responded?

It might appear that there is a major failure in the markets in Ghana. Investment has not responded to the opportunities created by the liberalised trade environment. This, as was noted in the introduction, is exactly the point made by the critics of structural adjustment. To address this issue we first ask if government policy has allowed the incentives to work fully. We then consider the factors that have determined investment in the firms in the survey.

3.1 Government Policies

The data collected as part of the RPED survey allows the role of government policy to be investigated rather fully. In the first wave of the survey very detailed questions were asked about the constraints facing the firm. In table 6 we present a regression for output which includes the answers to these questions as explanatory variables for output.[8] The firms were asked a series of questions about the nature of the obstacles to firm expansion; they were also asked detailed questions about price and foreign exchange controls and, finally, a series of questions covered labour regulations. In Table 6 the first set of these questions is used in Section II in the equation, the price control questions are in section III and labour regulations are in section IV.

The section II questions included ownership regulations, taxes, gaining investment benefits, government restrictions on activities, labour regulations, difficulty in obtaining licences, price controls, foreign exchange controls, lack of business support services, lack of infrastructure, utility prices, lack of credit, lack of demand, location regulations and competition from imports[9].

[8]A similar regression was run to explain productivity. As the results were practically identical we confine attention to the production function.

[9]Questions regarding labour regulations and price controls were asked twice in the questionnaire. Once as one of the options as to why the firm could not expand, the second time directly. It is these direct questions that

In table 6, section II, each of these variables is entered into the equation. Several of these factors emerge as important constraints for the firm. Labour regulations and foreign exchange controls are both significant, as are the problems posed by gaining investment benefits, government restrictions on activities and infrastructure. It will be noted that infrastructure and foreign exchange controls enter with a positive sign. This is not surprising. It is firms anxious to export and expand that notice these constraints; the fact that they have higher output than firms who do not observe the problem implies that such constraints have, or at least are perceived to have, an adverse effect on the firm. It will also be noticed that neither credit nor demand are significant.

In addition to the questions regarding obstacles to expansion the firms were also asked if they were affected by price controls on their inputs or outputs or by controls on access to foreign exchange. These variables were also added to the regression (section III) and the price control variables were both significant; foreign exchange controls were not a problem. A possible interpretation of these results will be given below.

The questionnaire also asked detailed questions on labour regulations. These questions were of the form: are you subject to the following regulations? There then followed questions regarding minimum wage legislation, hiring restrictions, limits on temporary hiring, layoff restrictions and layoff benefit requirements. The answers to these questions are entered in section IV of Table 6. Again some are significant, including restrictions on temporary hiring. The hypothesis that the coefficients on all the government policy variables are zero is decisively rejected.

In one respect these findings are surprising. A great deal of effort has been devoted to removing restrictions on business in Ghana. Nevertheless the formal test suggests that many restrictions remain significant in affecting the output of firms. The result that restrictions on labour hiring is significant is particularly surprising. It is clear that the apprenticeship system in Ghana, where workers can be hired for minimal amounts of pay and where, in effect, no labour regulations apply is not adequate for certain classes of firms. To investigate this issue further, Table 7 presents a breakdown, by sector, of public policies towards industry.

The first three columns of Table 7 show the percentage of firms affected by labour regulations, price controls and those which are experiencing some obstacle to expansion.[10] The last column shows those firms affected by poor infrastructure. This variable is constructed from a scoring system that the respondents were asked to use, a score of 5 indicates a very severe problem and a score of 1 indicates no problem. It is clear that all these restrictions are far more important for the Wood sector, which is the only sector with any major contribution to exports, than for the other industries. In fact price controls only matter for the Textile and Wood sectors. For the Wood sector 49% of firms are subject to labour regulations as against an average of 22%, while 38% mention some obstacle to expansion as compared with an overall average of 23%. Similarly infrastructure is a more severe problem for Wood than for any other sector. Wood sector firms are relatively large, and they export. These results suggest that it is for large, export oriented, firms that government controls remain a problem. This explanation is also consistent with the

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feature in sections III and IV of Table 6.

[10]The firms who mentioned any of the obstacles to expansion set out in Table 6, section II, are included in Table 7, column (3).

finding that labour regulations matter. For larger firms there is insufficient flexibility in hiring and this is regarded by them as a problem.

It needs to be noted that the expansion of the Wood sector is, in the light of these results, open to a rather different interpretation. Exporting wood products (classified as manufacturing) may be a device to avoid the controls on exporting lumber. If this is the case then the expansion of output recorded in Tables 1 and 2 is not indicative of a successful adaption to structural adjustment, as argued above, but is a device to evade controls and indicative of inefficiency. We have insufficient evidence on the Wood sector to pursue this issue further with this dataset.

3.2 Investment

Next we turn to the issue of investment. Table 8 presents a probit equation on the decision to invest. Again we include the same set of government policy variables as were included in the production function of Table 6. In this case none are significant. The most important variables affecting the decision to invest are profits per employee and whether or not the firm exports. This result - that exporting firms were more likely to invest - held when we controlled for sector, so it is not picking up the Wood sector effect. The implication is clear; where profits do rise investment does occur. The problem must lie in the profitability of the export sector. The inference we would wish to draw from these findings is that macro policies are not being translated into prices facing firms. Our evidence for this is the important impact of government policies on output. Such policies by limiting output growth will limit profits. In the case of wood products there are controls on output prices and regulations requiring processing of wood products. If the profits are lower the greater the degree of processing (and such is likely or the regulations would be unnecessary) these regulations act directly to limit profits and therefore investment.

4. Policies for Growth

It was noted in the introduction that there were essentially two views as the source of growth in the NICs. One view, associated with the World Bank, is that its export success lay in its trade and pricing policies. The alternative view is that success was due to the implementation of a selective industrial strategy. This dichotomy of view also exists in the interpretation of the experience of structural adjustment in Ghana. Lall, Navaretti, Teitel and Wignaraja (1994 p.31-32) argue that:

> "adjustment is premised on the expectation that "getting prices right", rapidly and across the board, is both necessary and sufficient for achieving sustained industrial and export development. This view derives from a simple neoclassical interpretation of the technological learning process. In particular it ignores the cost, difficulty and market failures involved in enterprises becoming efficient".

The authors later argue that the trade reform failed due to the speed with which the liberalisation was implemented, the severe scarcity of investible resources, a lack of information and

knowledge, a lack of the necessary skills and a lack of institutional support. Similarly, Mosley, Subasat and Weeks (1995, p.1467) argue that:

> "most African countries would benefit from a selective industrial policy. Whereas much of the manufacturing created in Africa after independence proved inefficient, this does not negate the case for protection designed to "back winners" and make them competitive on export markets."

The development of endogenous growth theory has focused attention on the externalities which may be present in education which will assist in the technological development of firms. Sengupta (1993) argues that economies of scale and the spill-over effects of exports are important for explaining the success of the NICs. In the discussion generated by the World Bank (1993) study of the NICs the arguments advanced are frequently of the form that governments did intervene, the countries did grow, therefore growth and intervention are linked. The alternative view would point out that where micro data is available for the NICs, as in Jacobsson (1993), there is no evidence that infant industries have grown rapidly to be internationally competitive. What new light on this dispute does the micro evidence from Ghana, offered in this paper, provide?

While the relative failure of exports in the Wood sector to respond to the real devaluation can be explained by the restrictions on output imposed by government policies, such an argument does not explain the failure of new export industries to emerge. It is possible the survey is misleading on this point. If new firms are appearing and becoming important exporters then our survey, which had limited information on recent firm formations to draw on, will be missing these new entrants. However, the macro data is entirely consistent with our survey in suggesting that manufactured export growth has been very limited. The issue is of central importance for any assessment of structural adjustment programs; have markets been tried and found wanting?

In fact, government induced market failure can readily explain the failure to develop manufacturing exports. The micro evidence shows clearly that rates of return on capital vary radically across firms of differing size and that wages rise with firm size, Table 9.[11] The rate of return on capital varies from 20 to 120% for medium to large firms. For smaller firms the rate of return is very much greater. This spread of rates of return its what would be expected from a highly segmented capital market in which financial flows have minimal influence in bringing rates of return together. The lower part of Table 9 shows that wages increase by a factor of four in moving from micro to large firms. Substantial size effects remain after controlling for the human capital characteristics of the workers, Teal (forthcoming). The rise in wages, with size, acts as a tax on the profits of firms as they attempt to grow.

The dilemma firms wishing to move into exports face is that to decrease the costs of capital an increase in size is necessary, such an increase is associated with a rise in wages which acts as a tax on the profits which are the only available source of finance. There are ways around this problem; the most obvious being the use of supplier capital to finance an expansion. This may be occurring, although there is no evidence for it in our survey. Again the interpretation that can be

[11]Teal (forthcoming) uses the labour market data from the survey and shows that this size effect is not due to differences in skill composition across firms or other observable human capital characteristics, or unobservable firm level factors.

advanced from the micro evidence of the survey is entirely consistent with the macro data. Government policy has prevented the establishment of sustained positive real interest rate, in a competitive banking system, which raises the cost of finance, limits its availability, and creates inefficiency in the use of funds which, in turn, acts to limit the ability of firms to respond to new investment opportunities. The government has made no attempt to stabilise the exchange rate so that negative real interest rates have been combined with considerable uncertainty regarding the long run relative prices facing agents in the economy.[12] It can, of course, still be argued that even if the government provided a more competitive financial environment, and sought to limit macroeconomic policy uncertainty, market failures in other areas would still prevent the development of manufacturing exports. However, it seems a little premature to announce that policies of financial liberalisation and macroeconomic stability have failed, when they have not been tried.

There is a more general issue to consider at this point in the argument. Should we expect manufacturing exports to grow if policies to liberalise prices were fully implemented? The Ghana economy is a natural resource rich economy and it would be expected that such exports would expand, as indeed they have over the last ten years. This point has already been indirectly considered. As noted above, the growth of Wood product exports may be a device for evading controls on lumber exports. It is possible that in a liberalised regime manufacturing would be concentrated in non-traded goods as inputs to the natural resource intensive export sector.

What of the view that there is a failure to provide appropriate technical institutions and a lack of skilled labour? Again there is evidence on this point from the survey. A great deal of policy attention has been given to providing institutions which will assist the manufacturing sector. In the first wave of the survey firms were asked if they had received advice or information from eleven such government institutions, which were identified in the pre-survey work. The ones that are most relevant for our purposes are the Intermediate Technology Centres, the National Board for Small Scale Industries, the Association of Small Scale Industries and the Export Promotion Council. The percentage of firms that have used these institutions is given in Table 10. All these institutions are either directly funded by, or subsidised by, the government. As can be seen from the table the only one of these institutions which has reached more than 10% of the firms in the sample is the Export Promotion Council. The Intermediate Technology Institutes reached only 4% of the firms. It seems clear that the information is not used by the firms because the incentives to expand, which would create a demand for the information, have simply not been allowed to work.

There is evidence too on whether a shortage of skilled labour and lack of business support organisations are perceived by the firms as a constraint on their output. The firms were asked to name their three most important constraints. Only 6% of firms mentioned skilled labour and only 5% mentioned lack of business support services as any one of these three major constraints. Again it could be argued that, if the firms were growing, then a shortage of skilled labour and support

[12]While positive interest rates in the Ghana economy are unusual they are not unknown. Real interest rates were positive in 1985. Since 1992 nominal interest rates have remained at about 30% while inflation by 1995 had risen to over 60%. Firms in Ghana have learnt that there is no serious commitment to stability by the government. If, as others have argued, uncertainty is a major cause of low investment, this adds another direct link between government policy failure and the low rate of investment.

institutions would become apparent. Such an argument would, however, have conceded that a supply side policy to alter the amount of skilled labour and information does not, of itself, increase output. Further, the argument that there is a shortage of skilled labour ignores the point that such labour is a traded good and supply could increase very rapidly if there was an increase in demand for such labour.

The causes of the limited investment growth follow immediately from the relatively limited success of output growth and the failure to proceed with financial liberalisation. We have presented evidence that investment does respond to profits so, even with the limitation imposed by the lack of financial markets, growth would be possible in the traditional export sector if government did not limit its output. It needs to be noted that the ability of this sector to grow as strongly as it has, without substantial investment, is a sign of the success of the structural adjustment program in ensuring that inputs are used more efficiently than was the case under the controlled regime. It is the limit to output growth, which in turn limits profit growth, which is the cause of the low investment. We are left without any clear evidence of the importance of market failures, except those which can be traced directly to the effects of government policies.

5. Summary and Conclusions

This paper has extended the usual discussion of structural adjustment policies by looking at their impact using micro data. Two arguments have been advanced. The first is that policy intention has only partially been translated into outcome. The second is that the failure of investment and exports to grow more rapidly can be traced to these policy failures. It is not the purpose of this paper to underestimate the importance, and success, of those policy reforms that have been implemented. Trade reforms have reversed the decline in exports and generated substantial growth in the tradable sector and, as shown in Tables 1 and 2, this is true within manufacturing. However the process of reform has been limited and the evidence for growth in the Wood sector, within manufacturing, is ambiguous evidence for success. The growth may be the result of controls which limit growth in lumber exports.

Evidence has been presented that government policy continues to have an adverse affect on the output of firms in general, and the output of firms in the exportable sector in particular. It has been shown that investment responds strongly to profitability; low investment is caused by low profits. The implication of this argument is that the massive change in relative prices implied by crude calculations of the real exchange rate are not reflected in the prices to firms. Evidence has also been presented that the financial market remains fragmented and the returns to capital differ radically between sectors and across firms. This financial market failure, at the micro level, reflects the macro policy failure to allow stable and positive real interest rates.

The alternative offered to price reform is a new, and selective, industrial policy. It is frequently argued that the lack of technical information, and the absence of selective intervention, are the major causes of slow growth. In fact, as documented above, the government supports a large range of such institutions and subsidises them all. These institutions fail to affect the firms to which they are directed and there is no evidence of any beneficial effects of the substantial expenditure made on these organisations. Policies of intervention, which resemble in all their essentials the policies that have failed in Ghana for the last thirty years, continue to fail. The policies which have not failed are those associated with structural adjustment. They have only partially succeeded because they have only partially been applied.

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Table 1 Percentage Changes in Value-added 1991-1992 and 1992-1993

Sectors for which domestic markets predominate	Value-added in 1991 '000 Cedis	Percentage Change 1991-1992	1992-1993	1991-1993
Foods	129,295	16	16	34
[N=14]	[350,315]			
Furniture	30,956	-7	73	62
[N=28]	[60,978]			
Metal	57,861	0	132	132
[N=24]	[158,478]			
Machinery	13,228	23	27	58
[N=5]	[17,087]			
Bakery	4,777	75	-13	53
[N=18]	[5,170]			
Average	**47,390**	**7**	**61**	**73**
[N=89]	**[165,751]**			
Sector facing strong competition from imports (a)				
Garments	5,202	-10	12	2
[N=27]	[13,830]			
Sector exporting				
Wood	150,669	95	20	133
[N=7]	[261,763]			
All Sectors	**44,038**	**23**	**46**	**80**
[N=126]	**[153,880]**			
Rate of Inflation (CPI)		**10**	**25**	**37**

N is the number of observations. The figures in [ ] parentheses are standard deviations.

(a) Textiles are not reported as there are only three firms on which we have data over the three waves of the survey. These firms are included in the overall total.

Table 2 Percentage Changes in Constant Priced Output 1991-1992 and 1992-1993

Sectors for which domestic markets predominate	Output in 1991 '000 Cedis	Percentage Change 1991-1992	1992-1993	1991-1993
Foods	293,076	7	17	25
[N=14]	[729,540]			
Furniture	63,199	-24	35	3
[N=28]	[114,369]			
Metal	222,819	-27	36	-1
[N=24]	[469,345]			
Machinery	58,967	-24	19	-10
[N=5]	[101,367]			
Bakery	32,745	7	-6	0
[N=18]	[26,671]			
Non-traded Average	**136,006**	**-13**	**25**	**8**
[N=89]	**[388,590]**			
Sector facing strong competition from imports (a)				
Garments	10,733	-25	63	22
[N=27]	[26,406]			
Sector exporting				
Wood	391,591	3	35	38
[N=7]	[665,978]			
All Sectors	**122,133**	**-10**	**27**	**13**
[N=126]	**[367,072]**			

N is the number of observations. The figures in [ ] parentheses are standard deviations.

(a) Textiles are not reported as there are only three firms on which the survey has data over the three waves of the survey. These firms are included in the overall total.

Table 3 Firm Size and Firm Growth

	Average Employment at Establishment	**Average Employment 1991**	**Average Employment 1992**	**Average Employment 1993**
Large	161	141	138	141
[N=6]	[66]	[157]	[166]	[168]
Medium	49	88	92	105
[N=18]	[16]	[91]	[81]	[96]
Small	13	34	36	38
[N=53]	[6]	[35]	[35]	[42]
Micro	3	12	16	14
[N=54]	[1]	[16]	[20]	[15]
All firms	**21**	**37**	**40**	**42**
[N=131]	**[37]**	**[61]**	**[60]**	**[66]**

	Average Employment in 1983	**Average Employment 1991**	**Average Employment 1992**	**Average Employment 1993**
Large	194	196	202	184
[N=9]	[47]	[145]	[138]	[171]
Medium	50	72	77	75
[N=22]	[20]	[60]	[59]	[70]
Small	14	21	24	22
[N=23]	[7]	[16]	[17]	[16]
Micro	3	12	14	16
[N=22]	[2]	[12]	[14]	[21]
All firms	**42**	**54**	**57**	**55**
[N=76]	**[62]**	**[82]**	**[82]**	**[87]**

N is the number of observations. The figures in [ ] parentheses are standard deviations.

Table 4 Labour Productivity in the Ghanaian Manufacturing Sector

	Value-added Per Employee in Cedis '000		
	1991	**1992**	**1993**
Foods	1,665	1,617	2,160
[N=11]	[2,311]	[1,966]	[2,546]
Furniture	684	404	593
[N=19]	[943]	[385]	[634]
Machinery	968	603	795
[N=4]	[1,422]	[716]	[962]
Metal	670	838	957
[N=17]	[752]	[933]	[1,005]
Bakery	949	1,016	953
[N=13]	[1,068]	[1,348]	[986]
Non-traded average	**920**	**865**	**1,045**
[N=64]	**[1,300]**	**[1,191]**	**[1,384]**
Garments	181	205	232
[N=18]	[177]	[211]	[214]
Wood	768	962	1,616
[N=5]	[598]	[345]	[555]
All sectors (a)	**756**	**731**	**907**
[N=88]	**[1,155]**	**[1,057]**	**[1,244]**

	Real Output Per Employee in 1991 Cedis '000		
	1991	**1992**	**1993**
Foods	4,161	3,767	4,190
[N=11]	[4,620]	[3,585]	[4,414]
Furniture	1,477	630	903
[N=19]	[2,456]	[543]	[727]
Machinery	4,844	1,720	1,932
[N=4]	[8,206]	[1,883]	[2,568]
Metal	2,246	1,964	1,960
[N=17]	[3,069]	[1,765]	[1,842]
Bakery	5,124	4,048	4,578
[N=13]	[3,959]	[2,833]	[3,497]
Non-traded Average	**3,094**	**2,286**	**2,559**
[N=64]	**[3,990]**	**[2,552]**	**[3,000]**
Garments	484	385	516
[N=18]	[563]	[381]	[532]
Wood	1,650	2,143	1,570
[N=5]	[1,082]	[1,543]	[320]
All sectors (a)	**2,454**	**1,872**	**2,062**
[N=88]	**[3,580]**	**[2,336]**	**[2,701]**

N is the number of observations. The figures in [ ] parentheses are standard deviations.
(a) Textiles are included in the total but not shown separately as there is only one observation over all three waves.

Table 5 Investment

	Ratio of Investment to the Value of Capital stock		
	1991	**1992**	**1993**
Foods	0.02	0.32	0.11
[N=15]	[0.05]	[0.59]	[0.17]
Furniture	0.04	0.08	0.06
[N=20]	[0.11]	[0.16]	[0.12]
Machinery	0.00	0.04	0.05
[N=5]	[0.00]	[0.07]	[0.09]
Metal	0.04	0.16	0.05
[N=21]	[0.10]	[0.31]	[0.07]
Bakery	0.03	0.14	0.09
[N=12]	[0.06]	[0.21]	[0.21
Non-traded			
Average	**0.03**	**0.16**	**0.07**
[N=73]	**[0.08]**	**[0.34]**	**[0.14]**
Garments	0.07	0.05	0.11
[N=24]	[0.20]	[0.16]	[0.24]
Wood	0.00	0.15	0.05
[N=4]	[0.00]	[0.25]	[0.08]
All sectors (a)	**0.04**	**0.13**	**0.08**
[N=102]	**[0.12]**	**[0.30]**	**[0.17]**

N is the number of observations. The figures in [ ] parentheses are standard deviations.

(a) Textiles are included in the total but not shown separately as there is only one observation over all three waves.

Table 6 A Production Function Including Government Policy Variables

Dependent Variable: Log(Value-added)

	Parameter	**Standard error**	**T Statistic**
Intercept	7.51	1.29	5.79
Section I Inputs			
Ln (Capital)	0.14	0.041	3.34
Ln (Labour)	0.75	0.11	7.08
Proportion male	0.84	0.26	3.19
Age	0.11	0.068	1.60
Age^2	-0.002	0.00093	1.69
Tenure	0.019	0.02	0.92
Education (in years)	0.025	0.023	1.05
Section II Obstacles to the expansion of the firm			
Ownership regulations	-0.47	0.423	1.11
Taxes	0.007	0.15	0.05
Gaining investment benefits	-0.61	0.21	2.95
Government restrictions on activities	-1.01	0.48	2.12
Labour regulations	-0.90	0.45	2.01
Licences	1.16	0.49	2.38
Price controls	0.022	0.84	0.03
Foreign exchange controls	1.01	0.33	3.07
Lack of business support services	0.23	0.15	1.56
Infrastructure	0.32	0.14	2.36
Utility prices	-0.18	0.14	1.36
Credit	0.38	0.25	1.50
Demand	-0.15	0.13	1.13
Location regulations	-0.02	0.19	0.09
Competition from imports	0.09	0.19	0.51
Section III Price and foreign exchange controls			
Price controls on inputs	4.79	1.00	4.79
Price controls on outputs	-1.963942	0.96	2.05
Foreign exchange controls	0.18	0.76	0.24
Section IV Labour regulations			
Minimum wages	0.24	0.26	0.91
Restrictions on hiring	-0.38	0.19	1.96
Restrictions on temporary hiring	0.79	0.28	2.82
Restrictions on layoffs	0.47	0.24	2.00
Layoff benefit requirements	-0.071	0.29	0.24
Section V Firm characteristics			
Firm age	-0.004	0.007	0.51
Union	0.59	0.22	2.64
Foreign ownership	0.44	0.26	1.70
State ownership	-0.22	0.25	0.89
Exporting	0.38	0.19	2.07
Wave 2	0.25	0.13	2.02
Wave 3	0.32	0.16	2.06

This equation uses the Pooled Three Waves of the Data and creates the Human Capital variables from the worker interviews.

Adjusted $R^2 = 0.76$, Number of observations = 322, Breusch-Pagan χ^2 (DF=46) = 101.7.

F(23,275)=2.25 is an F test rejecting the hypothesis that the government policy variables are jointly zero. The absolute t statistics are based on White (1980) heteroscedastic corrected standard errors.

Table 7 Public Policies Towards Firms

	Percentage of firms affected by			Infrastructure
	Labour regulations	**Price controls**	**Obstacles to expansion**	**Score (a) [Max=5]**
Foods	39	0	26	1.74
[N=28]	[27]	[0]	[14]	[0.68]
Furniture	18	0	22	1.59
[N=40]	[28]	[0]	[14]	[0.51]
Metal	28	0	23	1.75
[N=42]	[34]	[0]	[13]	[0.57]
Machinery	30	0	24	2.0
[N=8]	[32]	[0]	[15]	[0.44]
Bakery	5	0	17	1.43
[N=21]	[15]	[0]	[9]	[0.48]
Non-traded Average (a)	**23**	**0**	**22**	**1.67**
[N=142]	[30]	[0]	[13]	[0.56]
Garments	7	0	21	1.47
[N=43]	[19]	[0]	[11]	[0.46]
Textiles	47	11	23	1.69
[N=6]	[41]	[27]	[15]	[0.50]
Importable Average	**12**	**1**	**21**	**1.49**
[N=49]	[26]	[10]	[12]	[0.46]
Wood	49	26	38	2.01
[N=9]	[23]	[22]	[24]	[0.63]
Average	**22**	**2**	**23**	**1.64**
[N=200]	**[30]**	**[8]**	**[14]**	**[0.55]**

(a) Respondents were asked to score a range of infrastructure facilities on a scale of 1 to 5 where 1 was no problem and 5 a very severe problem. The reported variables is the average of those answers.

N is the number of observations. The figures in [ ] parentheses are standard deviations.
The data in this table refers to the first wave of the survey.

(a) The non-traded average includes small resource intensive firms which are not shown separately as there are only three observations. These firms made charcoal.

Table 8 A Probit Equation for the Decision to Invest

The Dependent Variable is 1 if the Firm Invests. 0 if no investment.
The investment is for plant and machinery.
Pooled Waves 2 and 3 of the Data

Maximum Likelihood Estimates
Log-Likelihood..... -128.0319
Restricted (Slopes=0) Log-L. -177.7008
Chi-Squared (45)..... 99.33796
Significance Level..... 0.56707E-05
.

Variable	Coefficient	Std. Error	t-ratio
Constant	-2.5329	1.217	-2.082
Section I Firm characteristics			
Wave Dummy	-0.13	0.19	-0.68
Profits per Employee	0.37	0.15	2.40
Ln(Labour)	0.34	0.13	2.66
Optimist	0.09	0.22	0.39
Ln (Capital/Labour Ratio)	-0.04	0.06	-0.56
Exports	1.70	0.56	3.06
Union	-1.02	0.55	-1.85
Section II Obstacles to the expansion of the Firm			
Ownership regulations	0.63	0.89	0.71
Taxes	-0.08	0.26	-0.30
Gaining investment benefits	-0.51	0.43	-1.17
Government restrictions on activities	0.41	1.16	0.36
Labour regulations	-0.03	1.14	-0.03
Licences	-0.98	1.08	-0.92
Price Controls	-5.34	48.20	-0.11
Foreign exchange controls	-0.55	0.76	-0.72
Lack of business support services	0.52	0.31	1.65
Infrastructure	0.37	0.25	1.51
Utility prices	0.02	0.24	0.06
Credit	-0.01	0.32	-0.03
Demand	-0.28	0.21	-1.34
Location regulations	0.61	0.31	1.95
Competition from imports	0.56	0.34	1.64
Section III Price and Foreign Exchange Controls			
Price controls on inputs	9.62	83.82	0.12
Price controls on outputs	-2.12	3.02	-0.70
Foreign exchange controls	-0.23	1.91	-0.12
Section IV Labour Regulations			
Minimum wages	0.07	0.46	0.17
Restrictions on hiring	0.48	0.62	0.77
Restrictions on temporary hiring	0.09	0.71	0.13
Restrictions on layoffs	-0.97	0.60	-1.62
Layoff benefit requirements	1.01	0.63	1.59

The equation also included financial variables but none were significant.
χ^2 (1) = 0.002 is a test for the hypothesis that all the coefficients on government control variables are zero. The hypothesis accepted at the 5% significant level.

Table 9 Profit Rates and Wages by Firm Size

		Profit Rates by Firm Size (a)		
Size in 1991		**1991**	**1992**	**1993**
Large	Mean	0.28	0.17	0.20
[N=12]	Std	0.40	0.16	0.29
Medium	Mean	0.39	1.22	0.91
[N=21]	Std	1.31	2.41	1.73
Small	Mean	2.42	4.93	8.20
[N=59]	Std	4.29	22.05	39.77
Micro	Mean	8.56	13.27	8.24
[N=24]	Std	11.72	35.39	15.95
All firms	Mean	3.10	5.49	6.06
[N=116]	Std	6.76	22.71	29.34

		Average Monthly Earnings in Cedis by Firm Size (b)		
Size in 1991		**1992**	**1993**	**1994**
Large	Mean	37,548	54,602	53,384
	N	180	152	193
	Std	22,636	42,985	40,238
Medium	Mean	33,643	37,523	37,914
	N	199	181	329
	Std	26,020	32,197	32,880
Small	Mean	17,048	21,594	24,938
	N	344	261	449
	Std	15,601	23,388	37,424
Micro	Mean	9,102	11,021	14,220
	N	55	59	92
	Std	10,811	10,960	13,005
All firms	Mean	25,474	32,737	33,191
	N	778	653	1063
	Std	22,526	33,958	37,053

(a) The profit Rate is the value of profits defined as value-added less wages as a ratio to the value of the capital stock which is calculated from the investment flows rather than the reported capital stock from the survey. If the reported capital stock series is used the pattern is similar although the figures are more erratic.
(b) The earnings figures are based on the individual data, not the firm level data for labour costs. The number of observations is the number of employees for which there is data.
N is the number of observations. Std is the Standard Deviation.

Table 10 Business Support Services to Firms

	Percentage of firms receiving assistance from:			
	Association of Small Scale Industries	**National Board of Small Scale Industries**	**Intermediate Technology Institutes**	**Export Promotion Council**
Foods	0	0	11	25
[N=28]	[0]	[0]	[31]	[28]
Furniture	3	13	0	18
[N=39]	[16]	[34]	[0]	[39]
Metal	2	10	5	10
[N=42]	[15]	[30]	[22]	[30]
Machinery	0	0	0	13
[N=8]	[0]	[0]	[0]	[35]
Bakery	0	5	5	0
[N=21]	[0]	[22]	[22]	[0]
Non-traded Average (a)	**1**	**7**	**5**	**14**
	[12]	**[26]**	**[22]**	**[34]**
Garments	0	5	0	0
[N=43]	[0]	[21]	[0]	[15]
Textiles	0	0	0	0
[N=6]	[0]	[0]	[0]	[0]
Importable Average	**0**	**4**	**0**	**2**
	[0]	**[20]**	**[0]**	**[14]**
Wood	0	0	0	44
	[0]	[0]	[0]	[53]
All sectors	**1**	**6**	**4**	**12**
[N=200]	**[10]**	**[24]**	**[18]**	**[33]**

N is the number of observations. The figures in [ ] parentheses are standard deviations.
The data in this table refers to the first wave of the survey.

(a) The non-traded average includes small resource intensive firms which are not shown separately as there are only three observations. These firms made charcoal.