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Abstract: This study evaluates the impact of privatization on financial performance and operating efficiency of six privatized enterprises, three state-owned enterprises and six private enterprises competing in three oligopolistic manufacturing industries in which privatization took place between 1984 and 1991 using panel data between 1970 and 1997. In our empirical analysis, we find no significant evidence that privatization in Malawi is associated with high profitability, high sales efficiency, low output, low employment. The evidence in favour of high net income efficiency in the post-privatization period is weak, but we find significant evidence that investment intensity declined in the post-privatization period. However, the regression analysis of determinants of profitability and operating efficiency shows that privatization increases the profitability and net income efficiency but reduces labour productivity, although we cannot ignore the role of state ownership, import competition, capital intensity and structural adjustment programs in influencing performance outcomes. We also find that privatization has significant industry effects, suggesting that studies that ignore the behaviour of competing enterprises in oligopolistic industries understate the impact of privatization.

Key words: Privatization; Profitability; Operating Efficiency; Malawi Manufacturing

JEL Classification:

1. Introduction

Privatization of state-owned enterprises (SOEs), defined as the transfer of ownership and control from the public to the private sector, has been a major policy instrument in private enterprise development in developed and developing countries since the early 1980s. Many developing countries, and African countries have followed the path of privatization of the state-owned enterprises (Adam et al., 1992; Cook and Kirkpatrick, 1995; White and Bhatia, 1998). The pull and push factors leading to privatization differ across countries (see White and Bhatia, 1998). Nonetheless, in most African countries, privatization of state-owned enterprises has been associated with World Bank and International Monetary Fund (IMF) sponsored structural adjustment programs (Adam, 1994; White and Bhatia, 1998).

The government in Malawi has implemented privatization of SOEs in Malawi within the framework of expenditure-switching and expenditure-reducing structural adjustment programs of the World Bank and IMF following the poor performance of state enterprises in the early 1980s (Adam et al., 1992; Adam, 1994). First, the government introduced the parastatal reform programme in 1981 to improve monitoring and control within the SOE sector to enhance the

operational efficiency of state-owned enterprises (Malawi Government, 1987). Secondly, the first phase of the privatization programme (1984 - 1992) began with asset swaps between two state holding corporations - the Agricultural Development and Marketing Corporation (ADMARC) and Malawi Development Corporation (MDC), and Press Corporations in 1984 (see Adam et al., 1992; Adam, 1994). This phase of privatization was supported under the first six structural adjustment loans that the World Bank provided to Malawi. Several estates, thirteen non-manufacturing enterprises and eleven manufacturing enterprises held by ADMARC and MDC were privatized by the end of 1992. The eleven privatized manufacturing enterprises were among the fifty-two manufacturing state-owned enterprises. The second phase is ongoing and began in 1996 under the seventh structural adjustment loan, the Fiscal Restructuring and Deregulation Programme. The scope of privatization in the second phase is much broader and the government identified more than one hundred and fifty state enterprises and assets in 1996 and more than fifteen major privatization activities have taken place between 1993 and 1998 (Privatization Commission, 1997, 1998).

Since privatization began in Malawi in 1984, no study has evaluated the performance of privatized enterprises more generally, and manufacturing enterprises in particular. Adam (1994: 142) notes that 'despite lying at the heart of the entire debate on privatization, the one area where our knowledge is weakest is the extent to which privatization has actually affected efficiency at enterprise level'. Two empirical problems have hampered progress in this area (see Adam, 1994; Martin and Parker, 1997). First, the problem of isolating the effects of other factors such as liberalisation and regulation on enterprise performance from the effects of privatization or ownership change. Secondly, most privatization activities are quite recent, such that one cannot embark on a meaningful comparison between the pre- and post-privatization enterprise level analysis. Thus it is quite possible for privatization to have an impact on performance with a substantial lag, hence we probably cannot observe performance changes in the short or medium term.

This study is motivated by the existing empirical research gap on the effect of privatization on efficiency. We use enterprise level data in selected manufacturing industries spanning the period 1970 to 1997, by selecting sectors in which privatization took place during the 1984-91 period in Malawi, in which privatized enterprises have been under private ownership for at least five

years. The study, therefore, contributes to the limited empirical evidence on the privatization-efficiency hypotheses, particularly in developing countries by taking into account oligopolistic interdependence and the impact of other liberalization measures on economic performance. The next section reviews theoretical and empirical literature. Section 3 reviews the methodology of assessing financial performance and operating efficiency. Section 4 describes the data and the estimation methods. Empirical results are presented in section 5 and in section 6 we provide concluding remarks.

2. Privatization and Efficiency: Theoretical and Empirical Framework

The main economic justification for privatization is that it promotes the economic efficiency of privatized state-owned enterprises. Four alternative theories explain the superiority of private ownership over public ownership, and the economic efficiency gains that are likely to emerge from the transfer of ownership and control of assets from the public to private investors. First, the property rights theory explains differences in the performance of public and private enterprises in terms of marked differences in attenuation of property rights (Demsetz, 1966, 1967; Furubton and Pejovich, 1972; De Alessi, 1980; Davies, 1981). Property rights in public enterprises are attenuated partly because property rights cannot be easily transferable. The problem of transferability implies that the cost and rewards of economic activities do not accrue more directly to individuals responsible for the property rights. The link between the average public owner (the taxpayer) and the manager of the public firm is extremely long, weak and tenuous; making monitoring of public managers' behaviour difficult. The general conclusion from the property rights theory is that the more attenuated property rights are, the less productively efficient will be the enterprise because attenuation weakens the rewards-penalties systems that are necessary for cost minimizing behaviour.

Secondly, extending the property rights approach, the principal-agent theory focuses on differences in the monitoring mechanisms and incentives that public and private managers face as agents of shareholders given welfare maximization for the former and profit maximization for the latter (Vickers and Yarrow, 1988; Bös and Peters, 1991; Bös, 1991). The change in ownership from the public to the private sector has at least two effects: a change in the objective from a weighted welfare function to profit maximisation and a change in the incentive structure by linking

reward to the level of performance under the private ownership. This shift towards profit maximisation may imply higher price, thus foregoing allocative efficiency, but there may be an increase in operational or productive efficiency.

Thirdly, the public choice theory takes the bureaucratic approach in which public enterprises are seen as an instrument of enhancing the utility functions of politicians such as maximization of votes and the budgets (Niskanen, 1972; Buchanan, 1972; Blankart, 1983; Boycko et al., 1996). Proponents of the public choice theory hold that government departments pursue objectives that do not maximize profits and usually pursue goals such as maximizing budget, risk aversion, employment and investment. Boycko et al. (1996) propose a model of privatization within the framework of public choice theory. The model shows that privatization will lead to effective restructuring of state-owned enterprises that are currently producing at inefficiently high levels to maximize employment, only if both cash flow rights and control rights pass from the government into private hands (particularly managers' hands). This will make it difficult for the government to bribe managers to produce at inefficient levels by offering them operating subsidies. Therefore, cutting the 'soft budget constraint' is vital to improving performance.

Finally, organizational theories emphasise the role of organizational characteristics in determining the performance of firms (Hartley and Parker, 1991; Dunsire, 1991; Bishop and Thompson, 1994; Martin and Parker, 1997). Proponents of organizational theories argue that differences in the performance of public and private firms are influenced by differences in management, goals, labour, communication and reporting systems, organisational structure, and the nature and location of business. In all the four theories of privatization, there is a consensus that ownership matters and does affect the internal efficiency of firms (cost minimizing behaviour) and the allocative efficiency in the market place.

The controversy about the economic efficiency effects of privatization becomes apparent when we explicitly introduce issues of product market competition in form of either number and size distribution of firms or market contestability and regulation. It is generally agreed that without product market competition, privatization *per se* may not significantly alter the performance of the firm. Others argue that it is competition in the product market that provides the strongest incentives towards economic efficiency. Models of public enterprises in oligopolistic industries

tend to shed more light on the uncertainty in the economic efficiency effects of privatization (see among others, Cremer et al., 1989; De Fraja and Delbono, 1989; Fershtman, 1990; De Fraja, 1991; George and La Manna, 1996; White, 1996; Pal, 1998). These models show that public ownership in imperfectly competitive markets can be an instrument of moderating private sector oligopolistic behaviour and the economic efficiency effects of privatization will depend on the trade off between productive efficiency gains and the allocative efficiency losses.

The empirical support for the impact of privatization on enterprise performance, on one hand, has mainly been motivated by a wide body of empirical evidence on the comparative performance of public and private ownership. On the other hand, the empirical evidence to substantiate claims of the improved efficiency due to the privatization of state-owned enterprises is very scanty and is still developing. Nevertheless, the results from comparative studies of private and public enterprises are mixed although largely supporting the propositions that emerge from the property rights and public choice theories that private enterprises are more efficient than state enterprises in achieving lower costs and higher productivity and profitability where firms operate in competitive environments.[1]

Existing comparative studies on the effect of privatization on economic efficiency do not offer unequivocal support that privatization increases efficiency. Needless to say, most of these studies have been undermined by the short time horizon of the period after privatization and the practical difficulties of separating other factors that affect firms' performance. Megginson et al. (1994) in an international study on the effect of privatization on performance based on the three-year window before and after privatization find evidence of improved financial and operating efficiency following privatization. Efficiency improvements were stronger among firms in competitive industry than among firms that were operating in noncompetitive environment. Boubakri and Cosset (1998) provide further evidence of the positive impact of privatization in developing countries using panel data based on the three-year window before and after privatization. However, in another study, Boubakri and Cosset (1999), find weak evidence of improved performance of privatized enterprises in African countries. Profitability insignificantly increased,

[1] See Martin and Parker (1997), Tittenbrun (1996), Domberger and Piggott (1994) and Boardman and Vining (1989) for a review of comparative public and private enterprise performance studies. Eckel et al. (1997), Boardman and Laurin (2000) provide evidence on share issued privatizations and industry effects of privatization.

while operating efficiency and real output insignificantly fell but capital expenditures significantly rose in the post-privatization period.

Martin and Parker (1997) in evaluating the impact of privatization in the United Kingdom conclude that the results on profitability and value-added per employee are less encouraging from their conclusion that it is difficult to sustain unequivocally the hypothesis that private ownership is preferable to nationalisation on efficiency grounds. La Porta and Lopez-de-Silanes (1999) compare the performance of privatized firms in Mexico four years before privatization and the performance in 1993, and find evidence in favour of increases in enterprise performance even after adjusting for industry changes. However, Villalonga (2000) in a study of privatization of 24 Spanish privatized firms, reject the hypothesis that privatization increases efficiency, using panel data of 3-8 years before and after privatization.

The empirical studies cited above generally provide evidence that privatization increases efficiency. However, most of these empirical studies that use the pre and post-privatization analysis, consider very short time horizons before and after privatization. The studies that use longer time horizons such as Martin and parker (1997) and Villalonga (2000) do not support the hypothesis that privatization significantly improves the efficiency of privatized enterprises.

3. Methods of Assessing Financial and Operating Efficiency

The various theories of privatization predict that privatization increases the performance of privatized enterprises and private enterprises competing in the same industry. The literature suggests various measures of enterprise performance. Recent empirical studies that evaluate the impact of privatization on the financial performance and operating efficiency use a variety of performance indicators (Megginson et al., 1994; Martin and Parker, 1997; Boubakri and Cosset, 1998 and 1999; La Porta and Lopez-de-Silanes, 1999). The use of as many indicators as possible is advocated in evaluating the impact of privatization on economic performance to gauge the consistency of the privatization-profitability relationship over different measures (Martin and Parker, 1997; Pollitt, 1995). However, these studies focus on privatized enterprises and ignore the industry effects of privatization.

Megginson et al. (1994), Boubakri and Cosset (1998 and 1999), La Porta and Lopez-de-Silanes (1999) use statistical tests to establish the difference in mean performance before and after privatization. Other studies have used the performance levels of private enterprises to adjust for economy wide effects on privatized enterprises performance (Boubakri and Cosset, 1998; La Porta and Lopez-de-Silanes, 1999). However, where privatization also affects competing firms in the industry, this adjustment procedure may understate the impact of privatization on economic efficiency. Here, we investigate the impact of privatization on competing firms within an oligopolistic market but isolate the effect of privatization on economic performance by controlling for other factors such as competition (domestic and import competition), organizational restructuring and the policy environment using multiple regression analysis. We first, present the various indicators of financial and operating efficiency, and then specify our econometric model of factors influencing economic performance.

3.1 Indicators of Financial and Operating Efficiency

The accounting ratios are grouped into profitability, operating efficiency, investment intensity, real output and employment. Table A1 presents detailed derivation of the financial and operating efficiency indicators. The first group of financial performance measures includes profitability indicators. The use of profitability as a measure of enterprise performance is based on the assumption that the objective of privately owned firms is to maximize profits. The principal-agent theory of privatization postulates that profitability is likely to be higher after privatization because the objective function of the firm changes from a weighted (consumer and producer surplus) welfare maximization to profit maximization. Profitability is usually measured by accounting rates of return including return on capital, return on assets, return on equity and return on sales. We use two indicators of profitability in our analysis. The first measure is the rate of return on sales (ROS) measured as a ratio of net income to total sales. The second measure that we use is the return on assets (ROA) measured as the ratio of net income to total assets.[2] Our benchmark measure is the ROS, because the ROA is highly affected by inflation - leading to undervaluation of assets and under-provision of depreciation.

[2] La Porta and Lopez-de-Silanes (1999) also use return on fixed assets.

The other measures of assessing changes in performance due to privatization in empirical literature relate to the operating efficiency of privatized enterprises (Boardman and Vining, 1989; Megginson et al., 1994; Boubakri and Cosset, 1998 and 1999; La Porta and Lopez-de-Silanes, 1999). The typical indicators of operating efficiency include the value-added per employee, sales efficiency, net income efficiency and sales per asset. Value-added per employee is the difference between sales and direct material inputs divided by the number of employees. Value-added per employee is a measure of net labour productivity while real sales per employee is a measure of gross labour productivity. Boardman and Vining (1989) also note that sales per employee and sales per assets relate to aspects of X-efficiency. Sales efficiency is estimated as the ratio of inflation-adjusted sales to number of employees each year while net income efficiency is calculated as a ratio of net income to number of employees per year. We hypothesize an increase in value-added per employee, sales efficiency, net income efficiency and sales per assets following privatization.

We also assess the impact of privatization on capital formation by examining the stock of capital and investment intensity indicators. We use two indicators of investment intensity: capital expenditure to sales ratio and capital expenditure to total asset ratio. The testable hypothesis is that both measures of investment intensity in privatized industries and privatized enterprises increase following privatization. This is due, among other reasons, that if privatization is accompanied by deregulation and market liberalization, the privatized enterprises face very large investment spending needs to become competitive with other private firms. In addition, in well developed capital markets, privatized enterprises have more access to private debt and equity markets. Another reason to believe that investment will increase is the involvement of foreign investors or multinational corporations in the privatization in developing countries which are expected to acquire new technology.

We also assess the impact of privatization on output and employment. The public choice model predicts that state-owned enterprises produce at inefficiently high levels to maximize employment and a change in ownership should lead to a decline in real output as a result of a decline in employment.[3] Due to better incentives, more flexible financing opportunities, increased

[3] This is one of the predictions in a model proposed by Boycko et al. (1996).

competition and greater scope for entrepreneurial initiatives that privatization allows, Megginson et al. (1994) argue that governments expect output to increase after privatization. Therefore, on *a priori*, we do not know the direction of the change in real output following privatization. We measure output as the natural logarithm of real sales and employment as the natural logarithm of the number of employees.

3.2 Factors Affecting Enterprise Performance

The extent to which privatization improves the performance of state-owned enterprises depends on the market structure and internal environment within which the firm operates. Therefore, we need a way to explain the determinants of enterprise performance, by taking into account the competitive process in the product market and changes in the internal structure of the firm. In this respect, we specify an econometric model that examines the determinants of economic performance based on the theoretical and empirical literature, and introduce variables that capture the impact of privatization. We focus on the determinants of enterprise profitability and operating efficiency.

Many factors influence the profitability and operating efficiency of firms in an industry. The theories of privatization and empirical studies suggest that the extent to which privatization affects efficiency depend on competition, organizational structure and economy-wide changes. For instance, we have observed that privatization in Malawi manufacturing has been implemented within the context of structural adjustment policies including trade liberalisation, industrial deregulation, currency devaluations. These other policies are likely to influence the performance of enterprises. The empirical model that we specify is a variant of the structure-conduct-performance model used in the analysis of the relationship between market structure and performance, by introducing variables that reflect privatization and organizational structure. The model that we use takes the following general form:

$$\pi_{jt} = \beta_0 + \beta_2 PRIV_{jt} + \sum_{k=1}^{m} \alpha_k X_{kt} + \varepsilon_{jt} \qquad (1)$$

where for firm j in industry $\imath$ and at time t, π is the measure of performance, PRIV is the dummy variable capturing privatization, **X** is the vector of variables representing competition, barriers to

entry and exit, demand variables, organizational characteristics and the policy environment, and ε is the error term.

Our regression analysis of the determinants of enterprise performance uses panel data methods to estimate equation (1). We use two measures of performance the return on sales (ROS) as our preferred measure of profitability and real sales per employee or gross labour productivity (SAEM) as our preferred measure of operating efficiency. Table A2 presents the definition of variables in the models.

The variables that determine enterprise performance are grouped into ownership structure and privatization, competitive conditions and industry characteristics, organizational structure and firm characteristics and policy environment. The ownership structure and privatization variables include the proportion of state ownership (STATE) in an enterprise at a given time and a dummy variable for the period after privatization (PRIV) for the overall effect of privatization on all firms, respectively. If privatization enhances performance, we expect a positive and significant relationship between profitability or gross labour productivity and the dummy variable PRIV. We also expect enterprise performance to decline with increases in state-ownership (STATE).

The role of competition and market structure in enterprise or industry performance has been an issue of considerable debate in both theoretical and empirical industrial economics, but there are no doubts that variations in market structure will lead to different performance results.[4] In order to capture the effects of monopoly power on enterprise performance, we use two indicators of market power to capture the effect of competition on profitability and include growth of industry output to capture demand effects. The first measure is the Herfindahl-Hirschman index (HHI) as a measure to capture the extent of domestic competition. The HHI is the sum of squared market shares (sales) of all firms in the industry. The higher the monopoly power, high values of HHI, the higher the level of profits. Nickell (1996) notes that there are theoretical reasons to believe that competition improves corporate performance, and finds a negative relationship between competition and total factor productivity growth. Thus, labour productivity declines with increases in concentration.

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4 See Martin (1993) for a review of theoretical developments and empirical studies.

The second measure of competition is the import share (IMPS) that captures the role of international competition. The IMPS is calculated as the ratio of imports of manufactured products for the industry to total domestic supply of products in that industry. The inflows of imports exert competitive pressure on domestic firms that in turn curtail the monopoly power of domestic firms. Profitability falls while labour productivity increases with increases in import competition. However, Mayes et al. (1994) note that high import ratios could actually indicate that the industry is inefficient relative to firms abroad, not that foreign competition drives out inefficient firms. The fact that there is excess demand which foreign firms are able to fill, points to the absolute inefficiency of production by domestic firms. In such industries, we can observe a negative relationship between labour productivity and import competition. The inclusion of the growth rate of industry output (GROW) captures demand effects on profitability.

We include two organizational characteristics in our model as determinants of profitability. First, we include the capital-labour ratio (KLR) to capture the intensity of production, and use this variable in the profit equations. In the operating efficiency equations, we use an alternative measure of capital intensity (KINT) calculated as the ratio of real capital stock to the real wage bill.[5] KLR and KINT capture the level of sunk costs that may inhibit changes and create barriers to entry and exit (Mayes et al., 1994). If the competition argument holds, profitability increases and labour productivity declines with increases in capital-labour ratio and capital intensity, respectively. However, a negative coefficient in the profit equations may obtain in developing countries based on the factor endowment theory which suggests that firms can improve their efficiency if they use the abundant factor of production. The positive relationship between KINT and labour productivity would justify the argument that capital intensive firms embody the most advanced technology.

Secondly, our sample of enterprises includes subsidiaries of multinational corporations. Eight of the fifteen enterprises are subsidiaries of multinational enterprises and one of the privatized enterprise was already a subsidiary of a multinational corporation before privatization while one

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[5] The use of the capital-labour ratio (KLR) in the operating efficiency equations may create problems of heteroscedasticity (due to specification) since labour is the denominator in both the dependent and independent variable (with measurement errors in labour reflected in both).

became a subsidiary after privatization. To capture the effect of multinationality on profitability and operating efficiency, we include a dummy variable for multinationality (MNC) that takes a value of one if at a given time the enterprise is a subsidiary of a multinational corporation. Caves (1996) notes that subsidiaries of multinational corporations may perform better than domestic firms because of proprietary assets, diversification and through blockading entry or intimidation of domestic rivals. Boardman et al. (1997) in addition argue that subsidiaries of multinational enterprises perform better than domestic corporations partly because of lower agency costs due to more concentrated ownership.

Privatization in Malawi is just one of the many policy changes that the government introduced in the 1980s. In an enterprise survey based on questionnaire interviews with managers of enterprises in the three privatized industries, managers attributed the changes in the organizational structure and behaviour to structural adjustment programs. However, modelling the impact of government policy on economic performance in a country under a phased structural adjustment program is a complex issue. Macroeconomic reforms were first introduced in 1981 within the framework of structural adjustment programmes with a series of devaluation of the domestic currency, changes in tariff protection, changes in input prices and changes in interest rates that had implications for the performance of manufacturing enterprises. Industrial sector reforms in the manufacturing sector in Malawi started in 1983 through to 1986 with price decontrol and in 1991 with entry deregulation. Due to the phased nature of policy reforms, we account for the policy changes by including a dummy variable for the structural adjustment programs (SAPS). Most of the policy reforms under structural adjustment programs were competition-enhancing and we therefore expect SAPS to be negatively related to profitability and positively related to gross labour productivity.

4. Data and Estimation Methods

Government ownership of enterprises in the manufacturing sector was vested in two state holding corporations, the Agricultural Development and Marketing Corporation (ADMARC) and the Malawi Development Corporation (MDC). These two corporations had ownership in thirty-two manufacturing enterprises with an average shareholding of 68.5 percent before structural adjustment programs in 1981. Most of these state-owned enterprises operate in mixed

oligopolies. Privatization in Malawi has been implemented in two phases within the framework of structural adjustment programs. The first phase was between 1984 and 1991 and stated with asset swaps between ADMARC, MDC and Press Corporation in 1984 with subsequent privatization in 1987 and 1991. The focus in the first phase was on the privatization and divestiture of subsidiaries and associate companies of ADMARC and MDC (see Adam et al., 1992). The second phase started in 1994 under the National Privatization Programme and is targeting more than 150 commercial state entities.

The study focuses on privatization in the Malawian manufacturing sector and excludes privatization activities in other sectors of the economy due to data limitations in the latter.[6] Table 1 shows the major privatization activities in the manufacturing sector, including asset swaps to Press Corporation, between 1984 and 1998. Ownership of twelve enterprises in the first phase and eight enterprises in the second phase was transferred to the private sector through private/negotiated bids or competitive/negotiated bids. Eight of the privatization activities involved existing shareholders with pre-emptive rights while four attracted new foreign investors.

[Table 1 about here]

Our sample of privatized enterprises is drawn from eight privatization activities (excluding asset swaps). We eliminated three enterprises that were not covered in the survey either because they ceased operation or did make the data accessible or whose data were not consistent at the National Statistical Office. Each of the five privatized enterprises were grouped into three-digit industry classification level. We also obtained data for private enterprises and other state-owned enterprises competing in the same industry.[7] This enabled us to obtain panel data between 1970 and 1997 for fifteen large scale enterprises in three privatized manufacturing industries in Malawi. The privatized manufacturing industries are three-digit industries in which privatization occurred between 1984 and 1991. The three privatized manufacturing industries are food processing,

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6 Data on enterprise level time series financial variables in other sectors of the economy are limited. For instance, most privatization activities occurred in the agricultural sector, particularly privatization of small agricultural estates in which ownership was transferred to individuals who do not keep consistent financial records.

7 One of the enterprises was privatized under the asset swaps, and is included as a privatized enterprise because it operates in the same industry as the selected privatized enterprises. The privatization year for the industry is determined by the sale of enterprises outside the share or asset swap.

manufacture of other chemical products and manufacture of transport equipment, and our sample include six privatized enterprises, three state-owned enterprises and six private enterprises.

The data were obtained from National Statistical Office based on unpublished data of the census of production. The census of production data is collected through a questionnaire, and with the permission of individual enterprises, we extracted the data from the questionnaire responses in each enterprise's file. We also obtained industry specific output and input deflators to adjust some variables into real values. The number of years privatized enterprises have been under the new ownership range from 5 to 10 years and range from 7 to 17 years before privatization depending on the industry. We also administered a questionnaire to all the fifteen enterprises on organizational changes and changes in the competitive environments that have occurred following privatization. We do not report the results of the enterprise survey, but what was clear is that managers attributed changes more to the overall structural adjustment program, than to a specific policy such as privatization.

We test the hypothesis that privatization increases the financial and operating performance of enterprises in the privatized industries in two ways. First, we use the statistical analysis of variance (ANOVA) to test the difference in the means before and after privatization. For each enterprise we code the value of zero as the period before and a value of one as the period after privatization in the industry. We obtain the F-test statistic under the null hypothesis of no relationship between performance and privatization. In addition, we establish the extent to which differences in the mean performance can be attributed to privatisation using eta-squared. ANOVA was carried out on SPSS version 8.0 (SPSS Inc, 1998).[8] The analysis is decomposed into three subsamples: privatized enterprises, SOEs and private enterprises.

Secondly, we estimate equation (1) for the full sample of enterprises in privatized industries and for the subsample of privatized enterprises. The significance of the privatization variable in the full sample will indicate that privatization affects the performance of all firms competing in the same industry as the privatized enterprise. The insignificance of privatization in the full sample

[8] See Bryman and Cramer (1999) for a detailed discussion and illustration of testing differences in means (comparing means) using analysis of variance.

and the significance in the subsample of privatized enterprises will indicate that privatization has no industry effects, hence privatization only affects the performance of privatized enterprises.

5. Empirical Results

5.1 Impact of Privatization on Performance: Statistical Results

Results of our statistical analysis of the financial and operating efficiency of firms in privatized manufacturing industries in Malawi are reported in Table 2 for the subsamples of privatized enterprises (PSOEs), state-owned enterprises (SOEs) and private enterprises (PVTs). The categorization of firms into privatized enterprises, state-owned enterprises and private enterprises, will enable us assess whether performance changes in privatized enterprises are different from those of SOEs and private enterprises. If improvements in the performance of privatized enterprises are above those in privatized enterprises, then privatization affects privatized enterprises more than competing private enterprises. State-owned enterprises are state-owned firms that have not yet undergone through the privatization process while private enterprises are those firms that have always been under private ownership.

First, with respect to profitability, the return on sales (ROS) shows lower levels of profitability than the return on assets (ROA). The likely argument for this is that inflation particularly in the period after privatization highly affects the ROA, and thus leading to undervaluation of assets and under-provision of depreciation. Although, we report results for both indicators, we prefer the ROS to the ROA in the discussion of our results. The results show that profitability measured by ROS for privatized enterprises and state-owned enterprises increase while it declines for private enterprise. The ROA shows a general increase in profitability across enterprises regardless of ownership status. The mean ROS in privatized enterprises increases from 7.7 percent before privatization to 15.7 percent to a level that closely matches the mean profitability of private enterprises following privatization. This relationship between performance and privatization is not statistically significant and privatization only accounts for 1.5 percent of the variance in ROS. The profitability of SOEs increased by 3.84 percent while that of PVTs declined by 1.44 percent. We, therefore, reject the hypothesis that privatization is associated with high mean profitability. The results also show that PSOEs and SOEs were generally profitable even before privatization,

although the rates of return on sales were about half those achieved among private enterprises. The return on sales of privatized enterprises matches that of private enterprises in the period after privatization.

[Table 2 about here]

Secondly, with respect to operating efficiency, the empirical evidence is mixed. Value-added per employee as an indicator of net labour productivity increases among PSOEs, while it falls among SOEs and PVTs. We only accept the null hypothesis of no differences in the mean value-added per employee among privatized enterprises. Otherwise, the negative relationships are statistically significant at the 1 percent level among SOEs and PVTs. One possible explanation for the fall in value added per employee among SOEs and PVTs is that most firms are substituting capital for labour as a response to structural adjustment policies. Ahsan et al. (1999) observe that this has increased the return on capital and decreased the return on labour. Sales efficiency (log of sales per employee), as an indicator of gross labour productivity, decline for PSOEs, SOEs and PVTs. However, the hypothesis of no difference in mean sales efficiency is rejected in the case of SOEs and PVTs at the 5 percent and the 1 percent level, respectively. The ratio of sales to assets increases after privatization across ownership status. The results reject the hypotheses of equal means before and after privatization at the 1 percent level for PSOEs and PVTs and at the 10 percent level for SOEs.[9] The mean sales-asset ratio for PSOEs also matches that of the private sector in the post-privatization period.

The net income efficiency, estimated by the ratio of inflation-adjusted net income to employees, in privatized enterprises increases following privatization. Net income efficiency increases from a mean of 1.44 before privatization to a mean of 2.63 after privatization and the null hypothesis of no difference in the means is rejected at the 10 percent level. Net income efficiency declines in state-owned enterprises and private enterprises and the means before and after privatization are statistically different at the 10 percent level in the former. The evidence on the operating efficiency impact of privatization is generally positive for privatized enterprises with significant

[9] The logarithm of the ratio of sales to assets is also affected by the undervaluation of assets and under provision of depreciation in the period after privatization due to high inflation during the period, hence the significant changes need to be treated with caution as they do not reliably reflect changes in performance.

changes in sales-assets ratio and the net income-employees ratio. The changes are above those observed in private enterprises. Value-added per employee increases in privatized enterprises compared to decreases among state-owned enterprises and private enterprises. The performance of private enterprises captures the industry effects of privatization and other economy-wide developments, but the fact that most of the increases are higher in privatized firms confirms the positive impact of privatization in Malawi manufacturing.

Megginson et al. (1994) argue that one reason we would expect investment spending to increase following privatization is the need for privatized firms to become competitive with other private firms particularly when privatization is accompanied by deregulation and market opening, and where capital markets are developed privatized firms tend to have greater access to private debt and equity markets. However, as La Porta and Lopez-de-Silanes (1999) note, investment expenditure may not increase significantly in cases where privatized firms operated with excess capacity in the period before privatization. Our preferred indicator of investment intensity is the investment-sales ratio as a flow measure and less affected by inflation than the investment-assets ratio which uses a stock measure. Investment expenditures as a ratio of sales and assets in the post-privatization period declined in all enterprises. The ratio of investment to sales declines less in privatized firms from 11.4 percent before privatization to 3.7 percent following privatization, compared to mean decline of 10.3 percent in SOEs and 11.0 percent among PVTs. The null hypotheses of no differences in mean performance before and after privatization is rejected at the 5 percent level with respect to PSOEs and PVTs but accepted among SOEs. Privatization explains only 3.4 percent, 0.6 percent and 8.1 percent of the variance in investment/sales ratio among PSOEs, SOEs and PVTs, respectively.

The ratio of investment to assets also declined following privatization. The results show that the investment-asset ratio falls from 10.9 percent to 5.3 percent among privatized enterprises, representing a mean change of 5.6 percent compared to a mean decline of 4.7 percent among private enterprises. The mean performance before and after privatization in both cases are statistically significant only among private enterprises. Generally, the analysis of the behaviour of investments in the post-privatization period shows that investment expenditure as a ratio of sales or assets declined across all types of firms, particularly among privatized and private enterprises. These results do not support the positive relationship between privatization and

investment intensity. However, in Malawi manufacturing, major investment expenditures may be limited because firms generally operated with excess capacity before privatization and structural adjustment programs. The evidence in the enterprise survey supports this argument. Ten of the fifteen enterprises experienced the increase in capacity utilization in the post-privatization period. Moreover, Ahsan et al. (1999) also note that factor substitution in favour of more labour-intensive production is taking place in Malawi manufacturing as a reaction to structural adjustment policies that have led to changes in the relative price of imported capital vis-a-vis the local labour resource.

With respect to output and employment, the results indicate that the mean real output among PSOEs increased following privatization, although the difference between the means before and after privatization is not statistically significant. Real sales among SOEs and PVTs fall, but the difference between means is statistically insignificant in both cases. The proportion of the variance in real sales that can be attributed to privatization is as small as 0.1 percent, 2.5 percent and 0.2 percent among PSOEs, SOEs and PVTs, respectively. The expected negative impact of privatization on employment is one of the political and social arguments against the transfer of assets from the public to the private sector. The evidence in Malawi manufacturing is contrary to the expectation of a decline in employment and the level of employment increases in PSOEs, SOEs and PVTs. Our results show that the mean change in the log of employment is much higher in PVTs (0.33) than in PSOEs (0.18) and in SOEs (0.12). Nonetheless, the proportion of the variance in employment attributed to privatization is low: 1.7 percent among PSOEs, 0.1 percent among SOEs and 5.7 percent among PVTs. Moreover, the mean differences in the level of employment before and after privatization are statistically significant among PVTs but not significant among PSOEs.

Table 3 presents a comparative analysis of the results in this study with previous studies using the same financial and operation efficiency indicators. The positive relationship between privatization and return on sales, sales to assets ratio and net income efficiency found in other studies have been confirmed in Malawi manufacturing. However, the increase in the return on sales is insignificant like in the study of privatization in African countries (Boubakri and Cosset, 1999). Contrary to other studies we find significant evidence of a decline in investment intensity, both among privatized enterprises and private enterprises. The factor substitution that is taking place is also

reflected in the significant decline in value-added per employee among private enterprises. Consequently, the changes in investment intensity may be attributed more to structural adjustment programs than privatization *per se*. The negative impact of privatization on employment cannot be supported using the data from Malawi manufacturing. The results on the employment impact of privatization are similar to those found in cross-country studies (Megginson et al., 1994; Boubakri and Cosset, 1998) but contrary to results from the Mexican privatization study (La Porta and Lopez-de-Silanes, 1999). Nonetheless, Ahsan et al. (1999) have observed that the capital-labour ratio during the structural adjustment period has declined as a natural reaction of firms towards more labour-intensive processes.

[Table 3 about here]

5.2 Impact of Privatization on Performance: Econometric Results

The statistical results presented in the previous section assume that privatization is the only factor that influences performance. Here, we investigate the impact of privatization on economic performance by taking into account the other factors that influence performance using regression analysis. Table 4 reports the econometric results on factors that influence the financial performance and operating efficiency based on a full sample in the privatized industries and results based on the subsample of privatized enterprises. All estimations were carried out on TSP version 4.4 using the PANEL command to obtain fixed effects and random effects models (Hall et al., 1995). We report results from the preferred models and report the Hausman specification test for the suitability of the random effect model that assumes that the individual effects are not correlated with explanatory variables. Although we report results for five indicators, we only discuss results from the return on sales (ROS) model as our benchmark profitability indicator and the sales per employee (SAEM) model as our preferred operating efficiency indicator and a measure of labour productivity.

First, we focus on regression results based on the sample of all enterprises in the three privatized industries in Model 1 and Model 2 in Table 4. The main hypothesis tested in these models is that privatization increases efficiency for both privatized enterprises and competing SOEs and private enterprises in the same industry. With respect to profitability, our results support the hypothesis

that the proportion of state ownership (STATE) is negatively related to profitability, and the coefficient is statistically significant at the 1 percent level. The elasticity of ROS with respect to state ownership implies that an increase of 1 percent in the share of government ownership causes a 0.45 percent decrease in the return on sales. Privatization is positively associated with the rate of return on sales and the relationship is statistically significant at the 1 percent level. This implies the rate of return on sales for enterprises in the privatized industries is 8.43 percent higher in the period after privatization than during the period before privatization. The significant positive impact of privatization on profitability supports our hypothesis that privatization has industry effects.

[Table 4 about here]

We find a positive but insignificant relationship between domestic monopoly power and profitability.[10] The collusion hypothesis is not supported by the data from three privatized industries. The results however show that international competition is the most important type of competition that influences the behaviour of firms in a highly oligopolistic domestic manufacturing sector in Malawi. We find a consistent negative relationship between profitability and import shares (IMPS). The relationship is statistically significant at the 5 percent level. Thus, increasing import competition by 1 percent reduces the return on sales by 1.21 percent. Kaluwa and Reid (1991) find similar results of a negative and significant relationship between profitability and import competition in the manufacturing sector.

The growth in industry output (GROW) is positively related to performance and the coefficient of the capital-labour ratio (KLR) is also positive, but both are statistically insignificant. The relationship between profitability and multinationality is negative and statistically insignificant. Although the coefficient of MNC is not statistically significant, this negative relationship suggests the possibility of transfer pricing among multinational corporations. The impact of structural adjustment programs captured by the policy environment dummy (SAPS) is negative and statistically significant at the 1 percent level in Model 1. The rate of return on sales is 8.8 percent

[10] Other studies on the determinants of price-cost margins in Malawi manufacturing find a negative but insignificant relationship between profitability and monopoly power (Kaluwa, 1986; Kaluwa and Reid, 1991).

lower during the structural adjustment programs period than before the structural adjustment period. The negative impact of structural adjustment programs on profitability is expected since most policy reforms in the manufacturing sector were competition-enhancing.

We now evaluate the determinants of operating efficiency in privatized manufacturing industries focusing on gross labour productivity estimated as real sales per employee in Model 2 in Table 4. The regression results also show that gross labour productivity declines with an increase in the proportion of state ownership. The elasticities of gross labour productivity with respect to state ownership is -0.21. Privatization is associated with lower gross labour productivity and the relationship is statistically significant at the 1 percent level. The sales per employee or gross labour productivity was 6.39 points lower in the period after privatization than in the period before privatization. These results confirm our observation in the statistical results that labour productivity declined in privatized enterprises, state-owned enterprises and private enterprises. Ahsan et al. (1999) attribute the decline in labour productivity to the increase in the labour intensiveness of production in the structural adjustment period. In this analysis, the coefficient of the dummy for structural adjustment is negative but statistically insignificant. Our results show that privatization initiated a further decline in labour productivity above that caused by overall structural adjustment policies.

The relationship between operating efficiency and monopoly power (HHI) is negative and statistically significant at the 1 percent level. The results show that labour productivity increases with an increase in competition, and supports the negative relationship between concentration and total factor productivity growth found by Nickell (1996). However, the relationship between gross labour productivity and concentration is inelastic, with a computed elasticity value of -0.27. The relationship between labour productivity and import competition is negative and the coefficient is statistically significant at the 1 percent level, contrary to the positive impact of competition and labour productivity. The significant negative coefficient is, however, consistent with Mayes et al. (1994) argument that high import inflows may be indicating the existence of inefficiency in the domestic market. We also observe that firms that belong to expanding industries have higher labour productivity.

The capital intensity variable (KINT) is positively associated with labour productivity and statistically significant at the 1 percent level. The positive relationship between labour productivity and capital intensity is consistent with the argument that capital intensive firms embody the most advanced technology, and this increases the productivity of labour. The effect of capital intensity on labour productivity is marginal, with the computed elasticity showing that if we increase capital intensity by 1 percent, gross labour productivity will increase by 0.08 percent. We find a positive and significant relationship at the 1 percent level between real sales per employee (gross labour productivity) and multinationality. Labour in subsidiaries of multinational corporations on average is 10.66 points more productive than in domestic firms. The impact of structural adjustment programs on sales per employee is negative, but the coefficient is statistically insignificant.

Turning to the regression results based on the sub-sample of privatized enterprises in Model 3 and Model 4, the performance of the variables is similar to that obtained in the full sample analysis. We do not find significant evidence that profitability and labour productivity decline with the level of state ownership, although the negative coefficient in the ROS model suggests that retained government ownership is associated with lower profitability. The hypothesis that privatization increases profitability of privatized enterprises is confirmed by the positive relationship between return on sales, real sales per employee, and the privatization dummy. The coefficient of the privatization dummy (PRIV) is statistically significant in the ROS model at the 10 percent level, but it is not significant in the labour productivity model. The hypothesis that privatization improves the profitability of privatized enterprises is supported in the subsample of privatized enterprises but it is less significant than in the full sample. On average, the return on sales was 13.9 percent higher in the period after privatization than before privatization. These margins are higher than those observed in the industry models in Model 1.

Monopoly power increases profitability while it reduces operating efficiency. However, the relationship is only statistically significant at the 5 percent level in Model 4 of gross labour productivity. An increase in concentration by 1 percent reduces labour productivity by 0.41 percent. The negative relationship between monopoly power and labour productivity, augment the evidence in the industry results in Model 2 although the elasticity is higher in the model of

privatized enterprises. Similar to results of the industry models, import competition reveals domestic inefficiency and the coefficient of IMPS is statistically significant at the 1 percent level.

The coefficient of the KLR in the profitability models is negative, and unlike in the full sample results it is statistically significant at the 5 percent level. Capital intensive technologies are associated with lower rates of return on sales, supporting the factor endowment argument of a developing country. Privatized firms that take advantage of the abundant factor of production in Malawi, labour, are more profitable. These results show that if we increase the capital-labour ratio by 1 percent, the return on sales will fall by 0.44 percent implying that profits are inelastic to the capital-labour ratio. The substitution of capital for labour that we observed in the statistical analysis has positive effects on the level of profitability for privatized enterprises. However, labour intensive firms are inefficient in terms of gross labour productivity in Model 4 as revealed by the positive and significant relationship between capital intensity and gross labour productivity. While using relatively more labour than capital is more profitable, such production may be technically inefficient.

The structural adjustment programs, SAPS, are negatively associated with profitability and positively associated with gross labour productivity, but the relationship is statistically significant at the 1 percent level only in Model 3 of the return on sales. The return on sales was 22.4 percent lower in the period after structural adjustment than before structural adjustment programs. This underscores the negative impact of structural adjustment policies on profitability that we observed in the full sample of observations. These results also show that the negative impact of structural adjustment programs on profitability is much stronger among privatized enterprises compared with those obtained in the full sample results.

6. Conclusion

This study has examined the impact of privatization on the financial performance and operating efficiency of privatized enterprises and other firms (state-owned and private) and determinants of performance using enterprise-level data from three privatized manufacturing industries in Malawi. The statistical evidence on the profitability and operating efficiency impact of privatization is mixed. We do not find compelling evidence that privatization increases the

profitability of all enterprises competing in the same industry. Neither do we find evidence that privatization increases the profitability of privatized enterprises. Value-added per employee insignificantly increased among privatized enterprises but significantly fell among state-owned enterprises and private enterprises. Privatization is associated with lower real sales per employee (labour productivity) in all enterprises in the three privatized industries, and significantly so among state-owned enterprises and private enterprises. The ratio of sales to assets increase following privatization across all types of enterprises.

We also find that investment intensity declined significantly in all firms regardless of ownership status following privatization, and declining more in competitive industries. This result is not surprising partly because most responses from firms in the enterprise survey on capacity utilization suggest that firms were operating with substantial excess capacity and additions to plant and machinery were therefore not significant. Our results also show that contrary to expectations real output increased following privatization in privatized enterprises, while it decreased in state-owned enterprises and private enterprises. Employment in the post-privatization period increased significantly compared to the period before privatization among privatized and private enterprises, but increases are generally higher among private firms. These results are contrary to the fears that employment decreases following privatization, more so in an economic environment in which the cost of capital (mainly imported) *vis-a-vis* the cost of labour (the local resource) increases following other adjustment policies particularly devaluation of currency.

When we control for other factors in multiple regression analyses, we find statistically significant positive relationship between profitability and privatization, but labour productivity declined after privatization. The evidence on the profitability impact of privatization is strong and robust in both the model of industry effects in which we pool the sample of privatized SOEs, SOEs and private enterprises and the model of the subsample of privatized enterprises. The implication of the significance of privatization in the industry model is that in small economies in which markets are highly oligopolistic, evaluating the impact of privatization on privatized enterprises alone ignores the industry effects of privatization, and therefore understate the positive impact of privatization on economic efficiency. We also find strong support in the industry effects model that the proportion of state ownership in an enterprise is negatively associated with profitability and operating efficiency confirming predictions of the theories of privatization. In addition, we find

that import competition is critical in curtailing domestic monopoly power by reducing profitability. Labour productivity, however, decreases with import competition suggesting that the inflow of imports may be merely revealing domestic inefficient production both from the industry model and the model of privatized enterprises. The impact of structural adjustment on profitability is negative, reinforcing the perceptions of managers in our enterprises survey and capturing the competition-enhancing policies. Overall, the econometric results show that although profitability was lower due to import competition and structural adjustment programs, privatization had a positive impact on the profitability of enterprises in the three industries. We also find evidence of falling labour productivity following privatization, confirming the statistical results of overall decrease in real sales *vis-a-vis* increases in employment as firms substituted capital for labour in the post-privatization era.

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Table 1 Major Privatization Activities in the Manufacturing Sector, 1984-1998

Company	Sector	Year Privatized	Government Equity (%)		Purchaser
			Before Privatisation	After Privatization	
Enterprise Containers Limited	Plastic Products	1984	22	0	Press Corporation [a]
Carlsberg Limited	Beverages	1984	27	0	Press Corporation [a]
Malawi Distilleries Limited	Beverages	1984	41	0	Press Corporation [a]
Malawi Pharmacies Limited	Other Chemical Products	1984	100	0	Press Corporation [a]
Nzeru Radio Company	Radio Assembly	1984	60	0	Gateway Industries Limited
B&C Metal Products Limited	Fabricated Metals	1987	31	0	Brown and Clapperton [b]
Advanx Limited	Rubber Products	1987	50	0	Advanx Limited [b]
Lever Brothers Limited	Other Chemical Products	1987	20	0	Lever Brothers (UK) [b]
PEW Limited	Transport Equipment	1987	87	0	Kamwai Corporation, NICO, Shire
National Oil Industries Limited	Food Processing	1991	77	23	Cargill Inc. (USA)
ADMARC Canning Limited	Food Processing	1991	100	0	Swan Industries Limited
Grain and Milling Limited	Food Processing	1991	75	25	Press Corporation & Namib Mills
Wood Industries Corporation	Wood and Wood Products	1993	100	0	Okhai Limited
Portland Cement Company	Non-Metallic Minerals	1996	51	49	Commonwealth Development Corp. (UK)
Packaging Industries Limited	Paper and Paper Products	1996	34	40	Transmar (SA) Ltd[b]
Encor Products Limited	Fabricated Metal Products	1996	23.3	0	Accord Trust[b]
Dwangwa Sugar Corporation	Food Processing	1996	14	51	Lonrho Sugar(UK)[b]
Sugar Corporation of Malawi	Food Processing	1996	4	40	Lonrho Sugar (UK)[b]
Dwangwa Sugar Corporation	Food Processing	1997	9	42	Lonrho Sugar (UK)[b]
Illovo Sugar Corporation	Food Processing	1997	14	30	Local Investors
Blantyre Dairy Limited	Food Processing	1998	60	40	Dairibord (Zimbabwe)
Optichem Malawi Limited	Industrial Chemicals	1998	23	0	Kynoch[b]

Source: ADMARC (various) **Annual Report and Accounts**, MDC (various) **Annual Report and Accounts**, Privatization Commission (various) **Annual Report and Accounts**, Privatization Commission (1998) **Privatization Newsletter** (various issues)

Notes: a Asset swaps with state holding corporations.
b The purchaser was a previous shareholder pre-emptive rights.

Table 2 Profitability and Operating Efficiency in Privatized Manufacturing Industries by Type of Enterprise

Performance Indicators	Privatized Enterprises (PSOEs)				State-Owned Enterprises (SOEs)				Private Enterprises (PVTs)			
	Mean before	Mean after	Mean change [p-value]	η^2	Mean before	Mean after	Mean change [p-value]	η^2	Mean before	Mean after	Mean change [p-value]	η^2
Profitability	*6(108)*	*6(48)*			*3(62)*	*3(22)*			*6(102)*	*6(56)*		
Return on Sales (ROS)	0.0771	0.1568	0.0796 [0.126]	0.015	0.0884	0.1268	0.0384 [0.486]	0.006	0.1624	0.1480	-0.0144 [0.613]	0.002
Return on Assets (ROA)	0.1616	0.2230	0.0615 [0.429]	0.004	0.1602	0.2536	0.0934 [0.105]	0.032	0.2151	0.2529	0.0378 [0.538]	0.002
Operating Efficiency	*6(108)*	*6(48)*			*3(62)*	*3(22)*			*6(102)*	*6(56)*		
Value-added/Employee	5.6493	5.8562	0.2070 [0.855]	0.000	6.9048	2.7060	-4.1989 [0.001]	0.124	9.1217	4.8955	-4.2262 [0.000]	0.092
Log (Sales/Employees)	2.1744	2.1138	-0.0606 [0.755]	0.001	2.6627	2.1352	-0.5274 [0.018]	0.066	3.0256	2.6165	-0.4085 [0.000]	0.116
Log (Sales/Assets)	0.0841	0.3889	0.3048 [0.004]	0.053	0.1600	0.5484	0.3885 [0.065]	0.041	-0.1115	0.3681	0.4796 [0.000]	0.114
Net Income/Employees	1.4399	2.6270	1.1871 [0.071]	0.021	3.1850	1.5074	-1.6776 [0.053]	0.045	3.6278	2.3444	-1.2834 [0.202]	0.010
Investment Intensity	*3(108)*	*3(48)*			*3(62)*	*3(22)*			*6(102)*	*6(56)*		
Investment/Sales	0.1135	0.0370	-0.0765 [0.021]	0.034	0.1412	0.0387	-0.1025 [0.478]	0.006	0.1429	0.0325	-0.1104 [0.000]	0.081
Investment/Assets	0.1094	0.0534	-0.0559 [0.101]	0.017	0.1083	0.0501	-0.0582 [0.333]	0.011	0.0923	0.0450	-0.0473 [0.003]	0.055
Output and Employment	*6(108)*	*6(48)*			*3(62)*	*3(22)*			*6(102)*	*6(56)*		
Log (Real Sales)	7.9997	8.1205	0.1208 [0.637]	0.001	9.0082	8.6057	-0.4025 [0.152]	0.025	7.3972	7.3199	-0.0772 [0.561]	0.002
Log (Employees)	5.8253	6.0067	0.1814 [0.104]	0.017	6.3456	6.4705	0.1249 [0.729]	0.001	4.3726	4.7034	0.3308 [0.003]	0.057

Notes: The numbers in italics and parentheses are respectively the number of firms/observations in each period and the figure in brackets is the *F*-test probability of rejecting the null hypothesis of no difference in performance before and after privatization. η^2 is the proportion of the variance in the performance measure that can be attributed to privatization.

Table 3 Comparative Effects of Privatization on Financial and Operating Efficiency

Performance Indicators	*Malawi*		BC (1999) *Africa*	LL (1999) *Mexico*		BC (1998) *Cross-Country*		MNR (1994) *Cross-Country*
	1	*2*	*1*	*1*	*3*	*1*	*3*	*1*
Profitability								
Return on Sales	+	-	+	+ [a]	+ [a]	+ [a]	+ [a]	+ [a]
Return on Assets	+	+	-	+ [a]	+ [a]	....	....	+ [c]
Operating Efficiency								
Value-added/Employee	+	- [a]	....	....	....	....	....	....
Sales/Employee	-	- [a]	+	+ [a]	+ [a]	+ [a]	+ [b]	+ [a]
Sales/Assets	+ [a]	+ [a]	....	+ [a]	+ [a]	...	....	....
Net Income/Employees	+ [c]	-	....	+ [a]	....	+ [a]	....	+ [c]
Investment Intensity								
Investment/Sales	- [b]	- [a]	+ [c]	+ [c]	- [a]	+ [b]	+ [c]	+ [b]
Investment/Assets	-	- [a]	+ [c]	+ [a]	- [a]	+ [b]	....	+
Output and Employment								
Sales (real)	+	-	-	+ [a]	+ [a]	+ [a]	+ [b]	+ [a]
Employment	+	+ [a]	....	- [a]	- [a]	+ [c]	+ [b]	+

Sources: BC (1999) - Boubakri and Cosset (1999), LL (1999) - La Porta and Lopez-de-Silanes (1999), BC (1998) - Boubakri and Cosset (1998), and MNR (1994) - Megginson, Nash and Randenborgh (1994)

Notes: (1) based on the sample of privatized enterprises, (2) based on the sample of private enterprises competing with privatized enterprises in the same industry and (3) based on the sample of privatized enterprises but adjusted for industry effects. (+)/(-) denotes an increase or decrease in the performance indicator following privatization and (....) stands for not applicable. Subscripts *a*, *b* and *c* indicate that the mean or median differences before and after privatization were statistically significant at the 1, 5 and 10 percent level, respectively.

Table 4 Regression Estimates of Determinants of Performance in Privatized Manufacturing Industries and Privatized Enterprises

Independent Variables	Privatized Industries		Privatized Enterprises	
	ROS	SAEM	ROS	SAEM
	Model 1	*Model 2*	*Model 3*	*Model 4*
STATE	**-0.1546** [a]	**-10.711** [a]	-0.1005	0.5000
	(-2.636)	*(-4.775)*	*(-0.784)*	*(0.180)*
PRIV	**0.0843** [a]	**-6.3902** [a]	**0.1385** [c]	3.2553
	(2.664)	*(-5.185)*	*(1.708)*	*(1.483)*
HHI	0.1767	**-16.686** [a]	0.0456	**-8.6567** [b]
	(0.888)	*(-3.270)*	*(0.170)*	*(-2.225)*
IMPS	**-0.4743** [b]	**-16.997** [a]	**-0.4939** [c]	**-19.077** [a]
	(-2.332)	*(-4.113)*	*(-1.769)*	*(-5.892)*
GROW	0.0584	**3.3143** [a]	-0.0125	**2.1648** [b]
	(1.517)	*(2.959)*	*(-0.283)*	*(2.221)*
KLR	0.0009	-	**-0.0087** [b]	-
	(1.636)		*(-2.040)*	
KINT	-	**0.2747** [a]	-	**0.3042** [a]
		(5.066)		*(3.941)*
MNC	-0.1299	**10.658** [a]	-0.1466	**13.675** [a]
	(-1.175)	*(3.484)*	*(-1.286)*	*(6.156)*
SAPS	**-0.0884** [a]	-1.2666	**-0.2236** [a]	1.1597
	(-2.991)	*(-1.142)*	*(-3.825)*	*(1.084)*
C	-	**35.088** [a]	-	**21.357** [a]
		(6.717)		*(5.225)*
Fixed Effects?	*Yes*	*No*	*Yes*	*No*
Adjusted R^2	0.2864	0.3481	0.3857	0.7075
Hausman test	16.485	2.129	42.805	5.176
[*p*-value]	[0.001]	[0.145]	[0.000]	[0.395]
N	387	387	151	151

Notes: The figure in parentheses and italics are t-statistics based on heteroscedastic-consistent standard errors. Subscripts *a*, *b* and *c* indicate that the parameter is statistically significant at the 1%, 5% and 10% level, respectively. *Yes* to 'firm effects' imply that the model is the fixed effects model with firm-specific constants and *No* implies a random effect model.

Table A1 Definition of Financial and Operating Efficiency Indicators

Variable	***Description***
Return on Sales (ROS)	The ratio of net income to total sales. Net income is equal to profit before taxation. Total sales revenue are equal to total value of products and services including resales sold both domestically and internationally.
Return on Assets (ROA)	The ratio of net income to total assets. Net income is equal to profit before taxation. Total assets are equal to the sum of the net book value at end of year, value of stocks, trade debtors, investments in corporate enterprises and financial assets.
Value-added/Employee	The ratio of inflation-adjusted value-added in thousands of Malawi Kwacha to employees. Value-added is equal to total sales minus the cost of raw materials minus cost of purchases for resales deflated by the Consumer Price Index (CPI).
Log (Sales/Employees)	The natural logarithm of the ratio of inflation-adjusted sales to number of employees. Sales are equal to total value of products and services including resales sold both domestically and internationally deflated by the industry specific output deflators.
Log (Sales/Assets)	The natural logarithm of the ratio of sales to fixed assets. Sales are equal to total value of products and services including resales sold both domestically and internationally. Total assets are equal to the sum of the net book value at end of year, value of stocks, trade debtors, investments in corporate enterprises and financial assets.
Net Income/Employees	The inflation-adjusted net income in thousands of Malawi Kwacha to number of employees. Net income is equal profit before taxation deflated by the Consumer Price Index.
Investment/Sales	The ratio of investment expenditure to total sales. Investment expenditure are equal to the sum of investments in land and buildings, plant ant equipment, transport equipment and office equipment. Total sales are equal to total value of products and services including resales sold both domestically and internationally.
Investment/Assets	The ratio of investment expenditure to fixed assets. Investment expenditure are equal to the sum of investments in land and buildings, plant ant equipment, transport equipment and office equipment. Total assets are equal to the sum of the net book value at end of year, value of stocks, trade debtors, investments in corporate enterprises and financial assets.
Log Sales	The natural logarithm of real sales. Sales are equal to total value of products and services including resales sold both domestically and internationally, deflated by the industry specific output deflators.
Log Employees	The natural logarithm of the number of employees.

Notes: The data came from unpublished enterprise level records of the **Annual Economic Survey** (National Statistical Office).

Table A2 Definition of Variables in Econometric Models

Variable	Definition of Variables
	Dependent Variables: Performance Measures
ROS	Rate of return on sales defined as ratio of net income to sales.
SAEM	Sales per Employee calculated as the ratio of real sales to number of employees.
	Independent Variables:
	Ownership Structure and Privatization
STATE	The proportion of state ownership in an enterprise at a given time.
PRIV	The dummy variable for privatization. PRIV = 1 for the period after the year of privatization in the sector, otherwise equal to zero. Thus, PRIV = 1 after 1991 in the food processing sector and after 1987 in the other chemical products and transport equipment sectors.
	Competitive Conditions and Industry Characteristics
HHI	The Herfindahl-Hirschman index calculated as the sum of squared market shares in terms of sales at 4-digit industry level.
IMPS	Import share calculated as the ratio of imports to total domestic supply (sum of domestic output and imports) at 4-digit industry level.
GROW	Growth of industry sales at 4-digit industry level.
	Firm Characteristics
KLR	Capital-labour ratio calculated as the ratio of real capital stock to the number of employees. Real capital stock was derived using perpetual inventory methods and deflated by industry-specific price deflators for capital.
KINT	Capital intensity calculated as the ratio of real capital stock to inflation adjusted labour costs.
MNC	Dummy variable for multinationality and is equal to one if in period t the enterprise was a subsidiary of a multinational corporation (with ownership of more than 50 percent), otherwise equal to zero.
	Policy Variable
SAPS	Dummy variable that takes a value of one after 1980, and zero otherwise to capture the effect of other industrial and macroeconomic policy changes such as devaluation, industrial price decontrol, investment deregulation and financial sector reforms.