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Record, Richard and Davies, Simon

University of Bath, UK; Ministry of Insustry and Trade, Malawi

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**DETERMINANTS AND IMPACT OF PRIVATE SECTOR INVESTMENT IN  
MALAWI: EVIDENCE FROM THE 2006 INVESTMENT CLIMATE SURVEY**  
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Richard Record and Simon Davies

Richard Record  
Economic Advisor  
Ministry of Industry and Trade  
PO Box 30366  
Capital City  
Lilongwe 3  
MALAWI  
t: +265 9334811  
e: [richardrecord@hotmail.com](mailto:richardrecord@hotmail.com)

Simon Davies  
Department of Economics and  
International Development  
University of Bath  
Bath  
BA2 7AY  
UNITED KINGDOM  
t: +44 1225 383691  
e: [sd245@bath.ac.uk](mailto:sd245@bath.ac.uk)

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# **DETERMINANTS AND IMPACT OF PRIVATE SECTOR INVESTMENT IN MALAWI: EVIDENCE FROM THE 2006 INVESTMENT CLIMATE SURVEY**

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## **Abstract**

Over much of the last two decades, the economy of Malawi has been characterized by economic turbulence and uncertainty that has done serious damage to the private sector. Rapid liberalization exposed an unprepared private sector to potentially damaging forces. This paper draws upon the most comprehensive enterprise survey carried out in Malawi in recent years to assess the current state of private sector investment. We find the following key results: (1) low labor productivity is explained primarily by lack inputs per worker, rather than insufficient capital employed; (2) foreign competition in either domestic or export markets encourages reinvestment of current earnings; (3) firms with monopoly power are less likely to invest in increased capacity; and (4) high interest rates encourage Malawian firms to invest incrementally and using retained profits.

## **1.0 Private sector development in Malawi**

### ***1.1 Background***

Malawi is a landlocked, least developed country in Southern Africa. With a GDP per capita of approximately US\$ 160, it is among the poorest countries in the continent. Per capita GDP growth averaged just 1.1 percent annually during 1994-2004 (WDI 2006), well short of the 6 percent minimum that the government estimates is needed to have a meaningful impact on poverty levels (Government of Malawi 2006).

There is a clear need for increased private sector investment and job creation in order to raise incomes, yet in this regard Malawi's economic performance over the last decade has been very poor. For 1994-2004, gross fixed capital formation averaged 12.6 percent annually, substantially below the 17.7 percent average recorded for Sub-Saharan Africa as a whole (WDI 2006). Donor-financed public sector investment dominates the investment that does occur in Malawi, with the private sector accounting for only around one third of fixed capital formation compared to around two thirds in Mozambique, Zambia and Tanzania (OECD 2007). Net private sector investment in Malawi is, therefore, close to zero once capital depreciation is taken into account.

Domestic savings have averaged -1.5 percent of GDP during 1994-2004, significantly below the Sub-Saharan Africa average of 16.9 percent for the same period (WDI 2006). Economic analyses of very low income countries such as Malawi tend to assume that low savings are a result of poverty. While Africa's higher poverty certainly does contribute to lower savings than in developing countries in Asia, it is also clear that Malawi has experienced a collapse in private savings and investment for reasons unrelated to poverty. In 1980 Malawi was managing to invest 25 percent of GDP, while savings were running at 17 percent of GDP (World Bank 1981). Achieving Malawi's economic growth goals will require investment at an intensity, not least in the private sector, much higher than that possible utilizing investment funds from foreign donors.

Given the small size of the economy and with only limited domestic demand due to very low incomes, it is essential that local firms are able to export in order to gain critical mass and grow. While the economy of Malawi is comparatively open with trade accounting for 74 percent of GDP in 2006 (OECD 2007), trade performance has consistently fallen below expectations with large dollar deficits essentially being

financed by foreign aid inflows. Data for 2006 suggest that, as in 2005, imports will outstrip exports by a ratio of two to one (OECD 2007). Sustained export growth in real terms has not been achieved as when the performance of one sector has improved, the performance in other sectors has worsened. Large current account deficits mean that the Malawi kwacha is under constant pressure.

Malawi's trade structure is also unbalanced, with the country continuing to maintain a dangerous dependence on tobacco exports for foreign exchange. In 2006, the share of tobacco exports was 55.5 percent, down marginally from 61.4 percent in 1999. Modern manufactured exports such as garments have increased their share of exports from 3.8 to 7.6 percent, sugar from 5.2 to 9.6 percent and tea from 8.8 to 9.9 percent, over the same period. Thus, while there appears to be an encouraging, if fragile, trend towards export diversification, tobacco continues to dominate.

Malawi's private sector is characterized by a "missing middle", with too few businesses in-between the larger corporations, and the many micro enterprises. The manufacturing sector is small and accounts for just 11 percent of GDP, down from a high of 32 percent in 1992 as a result of continued low investment. The private sector is also inward looking as only 14 percent of manufactured output is exported (RPED 2006); this is particularly striking for such a small economy.

While there are constraints and distortions limiting demand internationally (notably agricultural subsidies, technical barriers to trade and sanitary and phytosanitary requirements in developed country markets), the evidence would suggest, given Malawi's relatively poor trade performance compared to other commodity-dependent developing countries, that it is supply-side constraints rather than a lack of demand in the markets in which Malawi participates which are the primary barriers to export expansion. In fact Malawi enjoys moderate current account surpluses with the United States and European Union, but has massive deficits with nearer neighbors, most notably South Africa, Zimbabwe and Mozambique (Malawi Government 2005).

TABLE 1 ABOUT HERE

A long history of preferential treatment for parastatal corporations and conglomerates, (which by the 1980s accounted for around 30 percent of GDP), together with complex licensing regulations and controls governing the operations of the private sector, means that despite reforms associated with structural adjustment, the legal environment for business is not particularly hospitable (Record 2006). Malawi is currently ranked 110 out of 175 countries in terms of the costs of doing business, according to the World Bank's annual *Doing Business* survey (IFC 2006).

## ***1.2 Key constraints to private sector development***

The constraints to private sector development in Malawi are well-known, due in part to the large amount of analytical and diagnostic work that has been undertaken in recent years.

The *Investment Climate Assessment*, carried out in late 2005 is the most comprehensive and up-to-date survey of the private sector ever carried out in Malawi. The ICA consisted of a standardized survey instrument covering general operations, sales and exports, supplies and imports, capacity and innovation, investment climate constraints, infrastructure and services, conflict resolution/legal environment, business-government relations, labor relations, finance and productivity. The total sample consisted of 160 formal enterprises. The ICA survey identified a *population* of 185 formal sector manufacturing firms with eight or more employees operating in the six main centers of economic activity in Malawi (Blantyre, Lilongwe, Mangochi, Mzuzu, Thyolo and Zomba). Although a limited number of manufacturing enterprises are in operation outside these centers, the sample of 160 firms is highly representative of the total population of formal manufacturers, consisting of more than 85 percent of the entire population.

The survey pointed to the following four top constraints: macroeconomic instability; finance (access to and cost of); electricity supply; and, the availability of skilled workers. Macroeconomic instability was highlighted by 70 percent of ICA respondents as the primary constraint to doing business. At the time of the ICA survey, real interest rates were running in the region of 23 percent. While this represented an improvement on previous years (base rates peaked at 45 percent in early 2004), this still means that firms need to earn a very high rate of return on investment to justify borrowing for both

business start-ups and expansion. Recurrent food insecurity means that Malawi's (maize driven) CPI has rarely dropped below the 10-15 percent range during the last ten years<sup>1</sup>.

#### FIGURE 1 ABOUT HERE

60 percent of respondents cited access to and the cost of finance as a major constraint. This is a reflection of the macro instability that has driven real interest rates so high in Malawi. Severe budget overspending by government in the 1990s saw large scale crowding out of private sector borrowing from the banking sector, as banks unsurprisingly preferred to buy high yield, low risk treasury bills rather than extending higher risk loans to the private sector. The ICA data also show that while 70 percent of firms have access to some form of banking services, only 30 percent of firms have access to longer term financing (RPED 2006).

Both the cost and consistency of supply of utilities is a major constraint to private sector investment, highlighted by 50 percent of managers in the ICA survey. On average, 10 percent of sales are lost due to power outages and firms without a generator lose as much as 20 percent of sales to power cuts. Moreover, the lack of adequate national generating capacity constrains investment in power-intensive processes such as mining and smelting. Inadequacies in the power supply also have a negative impact on the water supply, which is reliant on electric pumps. Water outages have a particularly negative effect on manufacturers in the food processing sector.

50 percent of survey respondents also reported that the availability of skilled workers is a major constraint to investment. In Malawi, the major limitation is the availability of appropriate skills, rather than labor regulation. Analysis of the ICA data shows that only 50 percent of firms can afford to offer training, and that firms who do offer formal training are 60 percent more productive and increase worker remuneration by 20-30 percent (RPED 2006).

Additional significant constraints highlighted in the survey, while not the leading problems, include the costs associated with crime and corruption. Malawian firms lose 4

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<sup>1</sup> As of April 2007, Malawi's continuing economics reforms have resulted in inflation falling to a ten-year low of 8.2 percent. Nominal interest rates also dropped from 25 to 20 percent in November 2006.

percent of sales to crime (double the average for Sub-Saharan Africa), and pay on average 2 percent of sales to public officials to “get things done” (RPED 2006).

## FIGURE 2 ABOUT HERE

Since 2004, Malawi has made encouraging progress in improving the environment in which the private sector invests. Perhaps most crucially for the future, the Malawi government has for the first time put the private sector at the heart of national development policy. The new Malawi Growth and Development Strategy, launched in 2006, represents a significant departure from the expiring Poverty Reduction Strategy. The emphasis is now very much on achieving poverty reduction *through* economic growth, and the driver of this growth is clearly stated as the private sector (GoM 2006).

## **2.0 Analysis of the 2005 Investment Climate Assessment dataset for Malawi**

### ***2.1 Descriptors for Malawi***

This section gives descriptive information on the firms included in the dataset. According to the standard definitions of small (10-50 employees), medium (50-100 employees) and large (100+ employees) enterprises, the ICA sample of manufacturing enterprises includes 64 small firms, 40 medium sized firms, and 53 firms defined as being large.

Table 2 presents selected descriptive statistics. 22 percent of owners are non-Malawian citizens and 13 percent are female. In terms of ethnicity of the firm owner, 12 percent of owners are of European origin, and 37 percent of Asian or Middle Eastern origin. Throughout its modern economic history, Malawi has had a large non-indigenous business community. As in many other African countries, empowerment of the indigenous population is becoming an increasingly important political issue. It is therefore interesting for researchers to capture the differing investment choices of entrepreneurs from different ethnic origins.

The ICA data show that the average manager had 8.4 years of experience before joining the firm for which (s)he is currently working and is relatively well educated with 98.7 percent having completed high school; 18.4 percent have some college or university

education and a full 53.2 percent have completed a degree or possess a post-graduate qualification. This group of people therefore represent the educational elite in Malawi. The average business is 18.2 years old. 78 percent of firms interviewed can be described as having at least one local monopoly market. That is, at least one of their three main product lines possesses at least 60 percent of the Malawian market.

24 percent of firms indicated that they face “intense” competition from foreign firms, either through FDI or imports and 24 percent of firms interviewed export some of their products. The average firm suffered 75.8 incidences of power outages or surges from the national grid and 56.2 criminal incidences during 2004. 63 percent of firms indicated that bribery was common in their industry in order to “get things done”.

#### TABLE 2 ABOUT HERE

Table 3 presents data comparing Malawi with regional and world averages based on various investment climate assessments.

#### TABLE 3 ABOUT HERE

### ***2.2 Determinants of investment***

Malawian firms in the sample are currently utilizing 67 percent of installed capacity. This is higher than the regional average, but low by standards in other regions of the world. The percentage of net profits which are reinvested into the business in Malawi averages nearly 53 percent. 58 percent of firms also plan to increase their production capacity over the following two years. Our first dependent variable is thus a dummy indicating whether or not a firm intends to increase capacity, lending itself to a probit analysis. The second dependent variable indicates the percentage of profit reinvested in the firm and is continuous but bounded between zero and one hundred. 40 percent of firms in the sample do not reinvest any profits. We thus use a tobit regression model for this analysis.

While there are a large number of dependent variables included in this (and the following) regressions, the authors have elected not to drop non-significant variables. This follows usual practice in analyzing firm level data. In addition, it is interesting to

note the non-significance of variables commonly held to impede private sector investment, such as power outages for example, in determining profit reinvestment.

Focusing on the probit regression, we find that profits play a positive role with higher profits increasing the likelihood of a firm intending to increase productive capacity over the next two years. The monopoly dummy is significant and negative. This is unsurprising as basic economic theory informs us that monopolies will prefer to restrict output in order to earn supernormal profits.

Ownership is insignificant with the sign negative for owners of Asian extraction and positive for those of European extraction. A negative sign could be the result of businesses already being large or having excess installed capacity. Alternatively, these investors may see their businesses more in terms of a limited period investment project with a large initial capital investment, and then a period of payback. Indigenous Malawian investors, who are more severely bound by the high costs of credit due to fewer overseas connections, may choose to invest more incrementally using retained profits. Interestingly the comparative data (from Table 3) suggests that Malawian companies as a whole are less likely to develop completely new product lines compared to companies in the region, but more likely to pursue incremental investments such as upgrading an existing product line or introducing new production technology for an existing product.

No conclusions can be drawn from the bribery variable. It is interesting to note, however, that although firms in Malawi expend a higher proportion of sales on informal payments to “get things done” than elsewhere inside or outside the region (2.2 percent of sales compared to a Sub-Saharan Africa average of 1.8 percent and an East Asian average of 1.6 percent – see Table 3), firms in Malawi have greater confidence in their judicial system and the strength of their property rights enforcement mechanisms than firms in other developing countries (a score of 4.2 compared to 3.7 in Sub-Saharan Africa and 4.1 in East Asia). This perhaps implies that bribes in Malawi operate more in terms of an unofficial tax system and so may cause less distortion to investment incentives.

The second regression uses a tobit regression model to estimate the share of net profits reinvested in the firm in 2004. The regression results show that firms in Malawi which use a greater part of their existing capacity have a strong tendency to re-invest a greater proportion of net profits back into the firm. This is likely to be for three reasons. Firstly, firms with less spare capacity are more likely to be experiencing sales growth, and therefore have a greater need to expand the capital base to fill a growing order book, and secondly such firms are likely to be looking to expand capacity as they approach their production limits. Finally, firms which are producing nearer to their capacity are likely to have a higher ability to invest.

Exporters and firms which face “intense foreign competition” reinvest a significantly higher proportion of net profits than other firms. This suggests that although the process of economic liberalization in Malawi has been contentious, increased foreign competition may be stimulating the domestic private sector to re-invest more. The regression results also show that the greater the level of education of the principal manager in the firm, the greater the share of net profits reinvested in the firm.

The probit model indicates that more profitable firms are more likely to choose to expand capacity, while the tobit model shows that higher profits are associated with a lower share of net profits reinvested. However, these “profit-making investors”, while investing a lower share of profits, are investing greater amounts in aggregate terms.

Ownership variables are not significant but are negative for owners of European and Asian extraction. Although insignificant both bribery and crime are negative indicating some negative impact on reinvestment. The evidence from the Malawi ICA suggests that firms are moderately optimistic about the future. Other things being equal, the average Malawian firm would like to employ 102.7 percent of its existing workforce. This is lower than the regional average (112.2 percent<sup>2</sup>), but suggests that the average firm sees an expanding market.

#### TABLE 4 ABOUT HERE

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<sup>2</sup> Where this figure is significantly above 100 percent, it may indicate severe obstacles to business expansion rather than firm-level realistic growth prospects.

Table 5 presents OLS estimations for the log of the investment in Machinery and Equipment and Information Technology in 2004. Since only around a half and a quarter of the sample invested in these two areas respectively, we use a two stage approach to take account of potential selection bias. Firstly a probit is estimated to determine the probability of having invested in these two areas given certain characteristics<sup>3</sup>:

$$P(\text{Invested}=1 | X=x) = \Phi(X\beta)$$

where *Invested* is equal to 1 if a firm has invested and 0 otherwise and  $\Phi$  represents the cumulative distribution function of the normal distribution. Secondly the log of investment is regressed against determinants and the Inverse Mills Ratio (IMR) recuperated from the first stage probit for those firms that did invest<sup>4</sup>. The second stage regression is thus given by:

$$\ln(\text{Investment}) = X\beta + \sigma \frac{\phi}{\Phi} + \varepsilon$$

where the error terms  $\varepsilon$  are  $iid(0, \sigma^2)$  and  $\phi/\Phi$  is the density function of the normal distribution divided by its cumulative distribution.

The IMR is significant in the second regression, but not in the first suggesting selection bias in determining in IT investment but not investment in machinery and equipment. This is not surprising as a greater proportion of the sample (around a half) invested in machinery and equipment compared with only a quarter for IT. Initial OLS regressions without inclusion of IMRs gave almost identical results for machinery and equipment while the second regression changes more substantially following inclusion of the IMR, reflecting the selection bias present.

More established firms invest greater amounts in IT with the amount invested decreasing slowly as the firm ages. Firms which utilize a greater proportion of their capacity also invest more in IT, as do firms where the manager has a greater level of education.

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<sup>3</sup> Probit results are not presented here for brevity, but are available from the authors on request.

<sup>4</sup> Details of this method can be found in Maddala (1983), Chap. 8.

Firms that export and those that face intense foreign competition also invest significantly more in IT.

Crime appears to be a disincentive to invest, although the absolute value of the coefficient is small. Interestingly the monopoly dummy is negative but insignificant, implying that monopolies do not reinvest supernormal profits in growth enhancing technology.

Larger firms (with more employees) invest more in machinery and equipment and in IT while the plastics and textile industries invest significantly more in IT than the baseline food industry and the wood and metal industries invest significantly less in machinery and equipment.

TABLE 5 ABOUT HERE

#### ***2.4 Impact of previous investment on productivity***

A detailed analysis of firm-level productivity in Malawi was carried out by the Regional Programme on Enterprise Development (RPED 2006) and showed that the poor investment climate has a significant impact on enterprise performance, particularly in terms of the business costs associated with the electricity problem (outages and cost of a generator) and the crime problem (cost of security spending). Calculations by RPED suggest that exporters demonstrate lower annual labor productivity (US\$ 1,678) compared to non-exporters (US\$ 2,302), explained mostly due to the fact that exporters tend to be in more labor intensive sectors (primary products processing, garments assembly etc.). The most significant labor productivity difference is between locally owned firms (US\$ 1,776) and foreign owned firms (US\$ 6,090).

Cross-country comparisons by RPED indicate that Malawi's advantages lie in its very low labor costs (see Figure 3 below). However, these advantages tend to be offset by a very low capital base and aged capital stock, which negatively affects the performance of capital.

FIGURE 3 ABOUT HERE

On a TFP basis, RPED analyses show that enterprises in Malawi only perform better than enterprises in Madagascar, with 25 percent higher efficiency; productivity is similar to enterprises in Tanzania and Zambia and much lower than enterprises in South Africa. Enterprises in South Africa have 95 percent higher efficiency compared to those in Malawi, after holding other enterprise characteristics constant.

We estimate the impact of investment on productivity using Cobb Douglas production functions. The natural log of output per worker in 2004,  $y$  (output in 2004) is regressed on the natural logs of employees,  $l$ ; capital employed per employee,  $k$ ; indirect costs per employee,  $e$  and inputs per employee,  $m$ . The age of the firm,  $a$ ; and its square (to capture “learning effects”) are included as well as other variables of interest,  $\omega$ . Borrowing from the notation of Harding et al. (2004), we write this as:

$$y_{it} = \beta_l l_{it} + \beta_k k_{it} + \beta_m m_{it} + \beta_e e_{it} + \gamma_a a_{it} + \gamma_{aa} a_{it}^2 + \theta \omega_i + \varepsilon_{it}$$

In a second step, we look at output growth between 2003 and 2004. Output growth takes the first differences to strip out the individual firm fixed effects. All variables are in log form and  $d$  indicates the difference operator.

$$dy_{it} = \beta_l dl_{it} + \beta_k dk_{it} + \beta_m dm_{it} + \beta_e de_{it} + 2\gamma_{aa} a_{it} + \theta \omega_i + \varepsilon_{it}$$

We do not find evidence to show that investment in IT, machinery/equipment or buildings/land in 2003 has an impact on output in 2004 or output growth. While this result is somewhat disappointing, it is likely that the impact of such investments is realized over a longer period than the ICA data allow us to analyze.

In both sets of regressions we find positive and significant coefficients for direct and indirect inputs per worker, although the evidence is stronger in the standard cross-sectional analysis.

The key result from the standard cross-sectional analysis is that inputs (both direct and indirect) are the key determinants of output per employee. Capital is not significant in either set of regressions. This implies low productivity and idle capacity among firms surveyed. Hence output growth can be achieved merely through increasing the flow of inputs for production, without recourse to greater capital investment.

The first differences regressions give negative and significant coefficients for changes in the number of employees, thus the marginal employee decreases average output per worker (decreasing marginal returns to labor). This follows from the result above suggesting idle labor due to lack of inputs.

In the standard cross-sectional regressions, increased capacity usage has a positive and significant (but quantitatively small) impact on productivity. Better managerial education, Asian ownership, exporting, and foreign ownership are all positive but are insignificant. Dummies indicating firms where owners are of European extraction are consistently negative and either significant or just outside the region of significance. This result is difficult to explain, but we make a tentative hypothesis that this captures European owned estate agriculture in which labor productivity is low.

TABLES 7 AND 8 ABOUT HERE

### **3.0 Conclusions**

We find evidence that the private sector in Malawi is forced to borrow at higher costs than in other countries. This is reflected in a general reluctance to invest in new production facilities. Instead, firms tend to prefer to adopt a lower risk strategy of investing incrementally and using reinvested profits.

Where firms face intense foreign competition, either in the domestic market or in export markets, firms are more likely to reinvest current earnings. In contrast, domestic monopolies exhibit a lower likelihood to invest in increased capacity. This suggests that the process of market liberalization may have had positive impacts in terms of strengthening the competitiveness of those firms that have survived.

We find evidence that the most significant determinants of output growth are direct and indirect inputs per employee, rather than the stock of capital employed. This, combined with evidence of decreasing marginal returns to labor suggests poor utilization of labor resources among manufacturers, manifested by very low labor productivity.

The lack of significant results relating to bribery suggests informal payments of bribes to “get things done” are carried as a cost to firms, rather than having a negative impact on investment decisions. This may suggest that firms in Malawi operate in a “second best environment”, where although bribery is costly, it operates as an informal tax system and does not severely alter incentive structures.

In general, Malawi’s private sector appears to be cautiously optimistic about future prospects, although existing foreign firms, while demonstrating higher labor productivity, appear to be less likely to invest in new capital than domestic firms.

Finally, Malawi’s private sector appears to be divided into two main groups of investors – a “lower growth, cash cow” group, and a “higher growth, dynamic” group. Those in the first category appear to exhibit low capacity utilization, tend to be experiencing low profitability, are showing little sign of new investment, and are not reinvesting a significant share of profits. Firms in the second category exhibit higher capacity utilization, are experiencing greater profitability, are currently reinvesting a significant share of profits, and are planning new investment in the future. The first group may well be stuck in a kind of “low equilibrium trap” as discussed in Eifert et al. (2005) as a major risk among African manufacturing firms. The challenge for Malawian policy makers is to ensure that the majority of firms are located in the “higher growth, dynamic” group, and that other firms are able to migrate out of the low equilibrium trap, into the more dynamic, higher growth group.

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### Appendix 1: Variable descriptions

<b>Owner European</b>	Main owner of Firm is of European Extraction
<b>Owner Asian</b>	Main owner of Firm is of Asian or Middle Eastern Extraction
<b>% Capacity Used</b>	Percentage of Firm's Output Capacity used in 2004
<b>Manager Education</b>	Level of Education of Highest Manager: 1=Did not Complete High School; 6=Post-Graduate Education
<b>Export Dummy</b>	Dummy equal to 1 if Firm Exports at all
<b>Employees</b>	Natural Log of Number of Employees at time of Survey
<b>ln(Profit)</b>	Log of Profit in 2004
<b>Foreign Ownership</b>	Dummy indicating whether over 50% of firm is foreign owned
<b>Monopoly</b>	Dummy indicating whether any of 3 main product lines have more than 60% of Malawian market share
<b>Foreign Competition Important</b>	Dummy equal to 1 if firm indicated that it faces "intense competition" from foreign firms, either through imports or FDI
<b>Power Outages</b>	Number of power outages or surges from national grid suffered in 2004
<b>Bribery</b>	Dummy equal to 1 if firm indicated non-zero bribery amounts in industry
<b>Crime</b>	Number of incidences of theft, robbery, vandalism, arson in 2004
<b>Food</b>	Industry Dummy
<b>Textile</b>	Industry Dummy
<b>Chemical</b>	Industry Dummy
<b>Plastic</b>	Industry Dummy
<b>Metal</b>	Industry Dummy
<b>Interest Rate</b>	Interest Rate at which firm is repaying loan
<b>Machinery/Equipment Investment in 2003 Dummy</b>	Dummy indicating whether firm invested in Machinery or Equipment in 2003
<b>IT Investment in 2003 Dummy</b>	Dummy indicating whether firm invested in Information Technology in 2003
<b>Buildings/Land Investment in 2003 Dummy</b>	Dummy indicating whether firm invested in Land or Buildings in 2003
<b>dEMPL</b>	Change in log of employment between 2003 and 2004

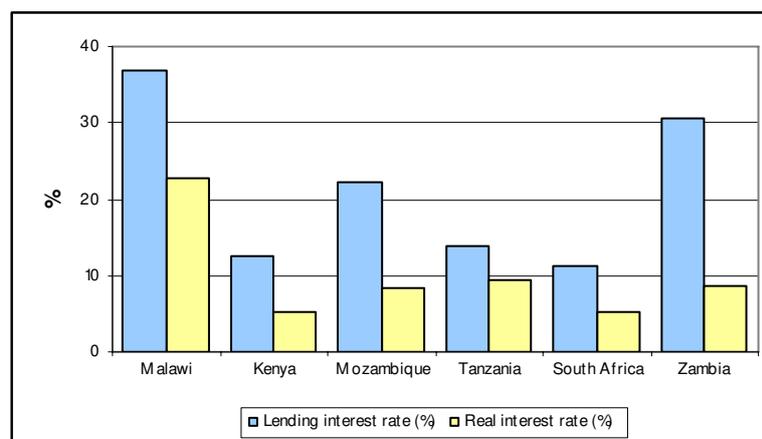
<b>d(K/L)</b>	Change in log of capital stock per employee between 2003 and 2004
<b>d(E/L)</b>	Change in log of indirect costs per employee between 2003 and 2004
<b>d(M/L)</b>	Change in log of inputs per employee between 2003 and 2004
<b>lnAge</b>	Log of firm's age
<b>lnAge_Sq</b>	Square of log of firm's age
<b>lnEMPL04</b>	Log of number of employees in 2004
<b>ln(K04/L)</b>	Log of capital stock per employee in 2004
<b>ln(E04/L)</b>	Log of indirect costs per employee in 2004
<b>ln(M04/L)</b>	Log of inputs per employee in 2004

**Table 1: Selected National Indicators – Malawi and Surrounding Countries, 2004**

Series	Malawi	Kenya	Mozambique	Tanzania	South Africa	Zambia	Zimbabwe
GNI per capita, (current US\$)	160	480	270	320	3,630	400	620
GNI per capita, PPP (current international \$)	631	1,130	1,168	671	10,964	890	2,041
Aid per capita (current US\$)	37.8	19.0	63.2	46.4	13.6	94.2	14.4
Foreign direct investment, net inflows (% of GDP)	0.9	0.3	4.0	2.3	0.3	6.2	1.3
Lending interest rate (%)	36.8	12.5	22.1	13.9	11.3	30.7	278.9
Real interest rate (%)	22.7	5.2	8.4	9.5	5.1	8.7	-15.8
Gross savings (% of GDP)	-7.7	13.6	6.2	8.5	14.4	12.5	3.1
Exports of goods and services (% of GDP)	26.5	26.2	30.0	18.6	26.6	19.8	36.1
Manufactures exports (% of merchandise exports)	16.4	21.1	...	20.2	57.6	10.0	28.5
Manufacturing, value added (% of GDP)	11.4	11.1	13.3	7.4	20.0	12.1	13.6
Mobile phone subscribers (per 1,000 people)	17.6	76.1	36.4	43.6	428.5	26.1	30.7
Personal computers (per 1,000 people)	1.6	13.2	5.8	7.4	82.2	9.8	77.3
Price basket for Internet (US\$ per month)	62.0	45.7	50.8	117.0	33.3	32.6	23.3
Urban population (% of total)	16.7	40.5	36.8	36.5	57.4	36.2	35.4

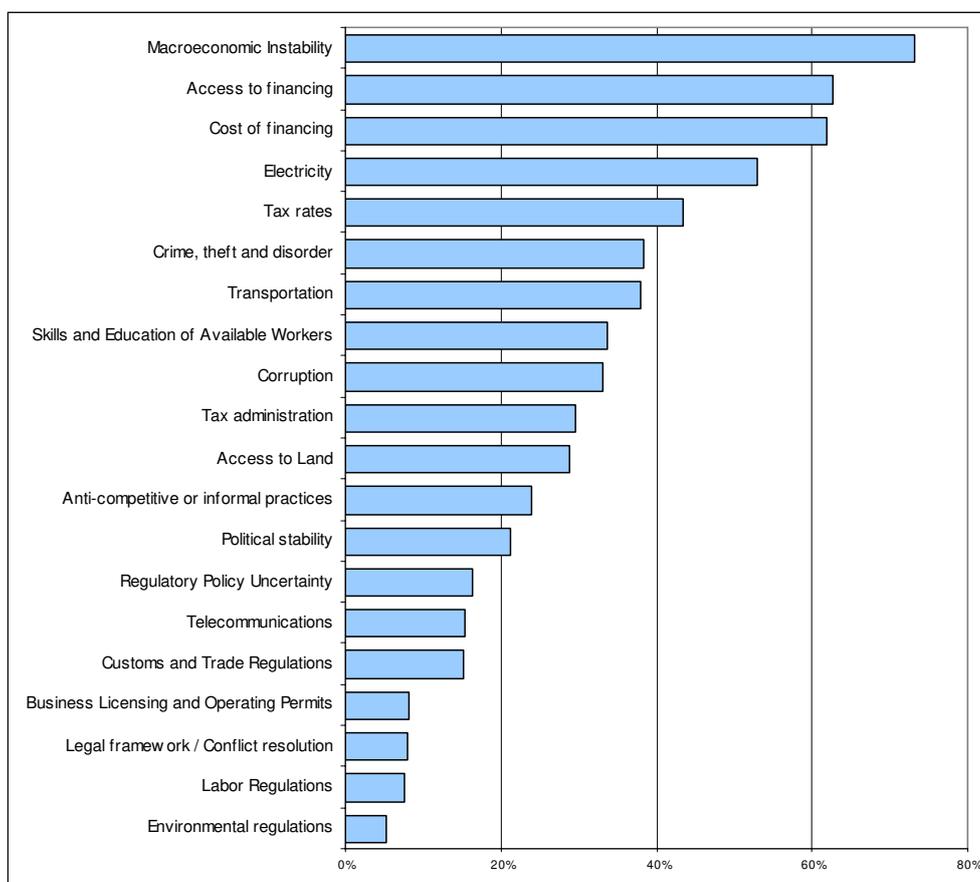
Source: World Development Indicators 2006

**Figure 1: Lending and real interest rates, selected countries, 2004**



Source: World Development Indicators 2006

**Figure 2: Percentage of Malawian firms perceiving obstacles to be “major” or “very severe” to operations and growth, formal vs. informal sector**



Source: RPED 2006

**Table 2: Selected Descriptive Statistics for Malawi**

	Obs	Mean	Std. Dev.	Min	Max
<b>Owner Foreign</b>	160	0.22	0.41	0	1
<b>Owner Female</b>	160	0.13	0.34	0	1
<b>Owner European Origin</b>	160	0.12	0.32	0	1
<b>Owner Asian Origin</b>	160	0.37	0.48	0	1
<b>Education of Highest Manager<sup>5</sup></b>	158	4.15	1.47	1	6
<b>Years Experience of Manager before joining Firm</b>	154	8.38	9.86	0	46
<b>Age of Business</b>	156	18.17	16.86	1	100
<b>Monopoly</b>	160	0.78	0.42	0	1
<b>"Intense Foreign Competition"</b>	160	0.24	0.43	0	1
<b>Export Dummy</b>	160	0.24	0.43	0	1
<b>No. Power Outages</b>	144	75.78	81.54	0	365
<b>Criminal Incidences</b>	154	56.17	412.42	0	5000
<b>Bribery Dummy</b>	160	0.63	0.49	0	1

<sup>5</sup> 1 represents the lowest level of education (did not complete high school) and 6 the highest (post graduate degree).

**Table 3: Comparative statistics from Investment Climate Assessments, means and standard deviations**

Indicator	Malawi (2005)	Sub- Saharan Africa	East Asia and Pacific	World
Borrowing rate of interest for most recent loan (percent)	24.16 (14.16)	16.67 (33.21)	8.22 (8.50)	15.34 (13.08) <sup>6</sup>
Term structure of most recent loan (months)	44.31 (47.50)	47.40 (47.04)	20.91 (20.91)	33.86 (36.64)
Percentage of firm sales exported	11.90 (28.48)	15.06 (30.50)	21.06 (36.58)	16.41 (32.22)
Average number of days lost to power outages in the last year (proxy for infrastructure quality)	75.78 (81.54)	59.64 (152.28)	5.28 (14.40)	20.08 (66.36)
Average number of days of product inventory maintained	54.06 (71.01)	44.95 (66.22)	27.03 (42.53)	29.54 (42.64)
Average number of days for importers to clear customs	6.44 (6.93)	9.48 (12.48)	6.89 (9.80)	7.29 (10.99)
Average number of days for exporters to clear customs	5.03 (9.84)	5.37 (8.04)	4.84 (8.29)	4.73 (7.59)
Optimum level of employment (% of existing workforce) (proxy for business confidence)	102.72 (21.04)	112.20 (85.60)	100.05 (52.01)	105.87 (47.19)
Informal payments to “get things done” (% of annual sales)	2.24 (5.78)	1.76 (6.19)	1.63 (4.62)	1.44 (4.62)
Confidence in judicial system, property rights enforcement (score 1-6 <sup>7</sup> )	4.21 (1.70)	3.73 (1.44)	4.08 (1.28)	3.69 (1.47)
Crime (% of sales lost per year)	2.20 (5.03)	1.36 (6.99)	0.41 (2.73)	0.74 (3.97)
Capacity utilization (%)	66.99 (25.31)	63.87 (25.30)	75.06 (21.02)	75.43 (22.26)
Whether the company has developed a new product line in the last year (y=1, n=0)	0.46 (0.50)	0.50 (0.50)	0.62 (0.48)	0.62 (0.49)
Whether the company has upgraded an existing product line in the last year (y=1, n=0)	0.41 (0.49)	0.34 (0.47)	0.46 (0.50)	0.46 (0.50)
Whether the company has introduced new technology that substantially changed the way that the main product is produced (y=1, n=0)	0.62 (0.49)	0.51 (0.50)	0.63 (0.48)	0.65 (0.48)
No. of workers	394.18 (1554.78)	167.99 (671.76)	365.80 (1651.93)	168.44 (819.93)

Source: Various Investment Climate Assessments. Standard deviations shown in parentheses.

**Table 4: Capacity Increase and Profit Reinvestment**

Regression:	Probit	Tobit
Dependent Variable:	Intend to Increase Capacity in Next 2 Years	% Profit Reinvested in 2004
Owner European	0.316 (0.653)	-15.632 (-0.873)
Owner Asian	-0.363 (-1.212)	-5.929 (-0.502)
Age	-0.056 (-1.294)	0.793 (0.930)
Age Squared	0.001 (1.351)	-0.004 (-0.378)
% Capacity Use	-0.004 (-0.556)	0.884*** (3.433)

<sup>6</sup> Excludes Latin America and Caribbean region.

<sup>7</sup> Ranging from 1 (fully disagree) to 6 (fully agree).

<b>Manager Education</b>	-0.032 (-0.285)	9.639** (2.242)
<b>Export Dummy</b>	0.436 (1.182)	31.663** (2.294)
<b>Employees</b>	-0.081 (-0.476)	5.337 (0.875)
<b>ln(Profit 2004)</b>	0.196** (1.980)	-7.221* (-1.965)
<b>Foreign Ownership</b>	0.366 (0.864)	-6.173 (-0.396)
<b>Monopoly</b>	-0.712** (-1.990)	19.559 (1.519)
<b>Foreign Competition Important</b>	0.155 (0.457)	43.358*** (3.310)
<b>Power Outages</b>	0.001 (0.422)	0.064 (0.859)
<b>Bribery</b>	0.033 (0.109)	-5.230 (-0.462)
<b>Crime</b>	-0.001 (-0.351)	-0.057 (-1.052)
<b>Textiles</b>	0.572 (0.917)	-2.166 (-0.097)
<b>Chemical</b>	0.229 (0.415)	-19.102 (-0.835)
<b>Plastics</b>	0.436 (0.949)	22.745 (1.271)
<b>Metals</b>	-0.637 (-1.281)	28.477 (1.538)
<b>Wood</b>	-0.842 (-1.212)	-6.015 (-0.232)
<b>Furniture</b>	0.992* (1.894)	23.641 (1.218)
<b>Other</b>	0.265 (0.536)	1.415 (0.075)
<b>Constant</b>	-1.634 (-1.306)	-21.097 (-0.441)
<b>Sigma</b>		50.875*** (11.644)
<b>N</b>	122	122
<b>r<sup>2</sup><sub>p</sub></b>	0.224	0.044
<b>chi<sup>2</sup></b>	37.351	42.115

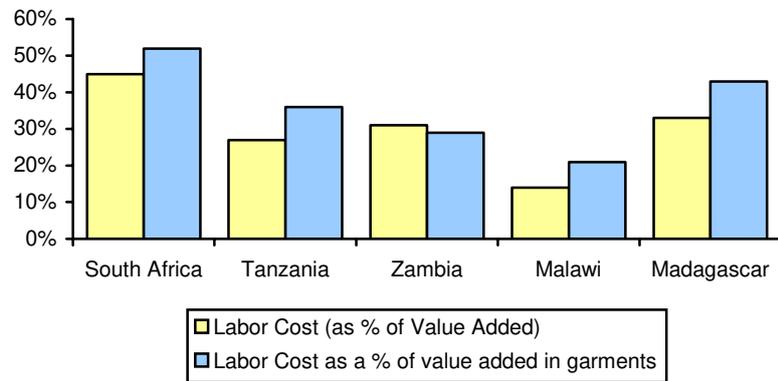
(t-ratios in brackets; \*, \*\* and \*\*\* indicate significance at 10%, 5% and 1% level respectively)

**Table 5: Investment in Machinery/Equipment and Information Technology**

Dependent variable: Log of investment (2004) in:	Machinery / Equipment	
		IT
<b>Owner European</b>	0.705 (0.448)	2.333 (1.472)
<b>Owner Asian</b>	0.947 (1.053)	-0.604 (-0.599)
<b>Age</b>	0.025 (0.592)	0.292*** (3.830)
<b>Age Squared</b>	-0.000 (-0.413)	-0.002*** (-3.671)
<b>% Capacity Use</b>	0.010 (0.517)	0.102** (2.918)
<b>Manager Education</b>	-0.087 (-0.348)	1.215** (2.719)
<b>Export Dummy</b>	-0.020 (-0.015)	3.499* (2.036)
<b>Employees</b>	0.584** (2.115)	1.084** (2.586)
<b>ln(Profit)</b>	0.261 (1.330)	0.258 (1.598)
<b>Foreign Ownership</b>	-0.154 (-0.133)	3.301** (3.466)
<b>Monopoly</b>	0.535 (0.647)	-1.116 (-1.405)
<b>Foreign Competition Important</b>	0.496 (0.637)	5.292** (3.110)
<b>Power Outages</b>	0.001 (0.194)	0.002 (0.297)
<b>Bribery</b>	-0.648 (-0.787)	0.496 (0.490)
<b>Crime</b>	0.001 (0.420)	-0.019* (-2.103)
<b>Textiles</b>	0.533 (0.339)	2.978** (2.878)
<b>Chemicals</b>	0.440 (0.395)	1.068 (1.079)
<b>Plastics</b>	-0.357 (-0.331)	4.730** (2.542)
<b>Metals</b>	-2.026* (-1.946)	1.237 (0.850)
<b>Wood</b>	-2.607* (-1.972)	-0.276 (-0.165)
<b>Furniture</b>	-1.709 (-1.152)	(dropped)
<b>Other</b>	-0.578 (-0.593)	-3.136* (-2.336)
<b>Mills Machinery</b>	-0.261 (-0.055)	
<b>Mills IT</b>		5.967** (2.483)
<b>Constant</b>	7.599** (2.213)	-23.312* (-2.342)
<b>N</b>	69.000	30.000
<b>r<sup>2</sup></b>	0.632	0.885
<b>F</b>	3.361	2.450

(t-ratios in brackets; \*, \*\* and \*\*\* indicate significance at 10%, 5% and 1% level respectively)

**Figure 3: Labor costs lower in Malawi (% of value-added) than countries in Sub-Saharan Africa**



Source: RPED 2006

**Table 6: Cobb Douglas Production Functions: 2004**

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Dependent variable:</b>	<b>Log of output per employee in 2004</b>					
<b>lnEMPL04</b>	-0.006 (-0.124)	-0.046 (-0.655)	-0.046 (-0.651)	-0.045 (-0.644)	-0.045 (-0.636)	-0.045 (-0.631)
<b>lnK04/L</b>	0.055 (1.358)	0.060 (1.363)	0.060 (1.354)	0.059 (1.350)	0.060 (1.357)	0.060 (1.317)
<b>lnE04/L</b>	0.302*** (4.777)	0.324*** (4.669)	0.323*** (4.529)	0.324*** (4.645)	0.324*** (4.640)	0.324*** (4.472)
<b>lnM04/L</b>	0.512*** (11.084)	0.489*** (8.980)	0.489*** (8.893)	0.487*** (8.854)	0.489*** (8.934)	0.487*** (8.643)
<b>Age</b>	0.002 (0.186)	0.003 (0.302)	0.003 (0.299)	0.003 (0.294)	0.003 (0.302)	0.003 (0.291)
<b>Age Squared</b>	-0.000 (-0.133)	-0.000 (-0.057)	-0.000 (-0.054)	-0.000 (-0.037)	-0.000 (-0.054)	-0.000 (-0.037)
<b>Owner European</b>		-0.337* (-1.683)	-0.337* (-1.675)	-0.346* (-1.687)	-0.339 (-1.655)	-0.345 (-1.646)
<b>Owner Asian</b>		0.018 (0.128)	0.016 (0.117)	0.012 (0.088)	0.017 (0.117)	0.012 (0.086)
<b>% Capacity Use</b>		0.007** (2.503)	0.007** (2.486)	0.007** (2.499)	0.007** (2.474)	0.007** (2.446)
<b>Manager Education</b>		0.014 (0.297)	0.015 (0.300)	0.014 (0.284)	0.014 (0.291)	0.014 (0.282)
<b>Export Dummy</b>		0.119 (0.709)	0.124 (0.703)	0.129 (0.739)	0.122 (0.682)	0.129 (0.694)
<b>Foreign Ownership</b>		0.057 (0.334)	0.056 (0.328)	0.058 (0.340)	0.056 (0.327)	0.058 (0.334)
<b>Monopoly</b>		0.110 (0.746)	0.109 (0.735)	0.105 (0.693)	0.111 (0.744)	0.104 (0.683)
<b>Foreign Competition Important</b>		-0.126 (-0.848)	-0.126 (-0.842)	-0.127 (-0.849)	-0.126 (-0.842)	-0.127 (-0.840)
<b>Power Outages</b>		0.001 (1.498)	0.001 (1.492)	0.001 (1.496)	0.001 (1.492)	0.001 (1.476)
<b>Bribery</b>		0.063 (0.464)	0.062 (0.461)	0.065 (0.477)	0.065 (0.452)	0.064 (0.444)
<b>Crime</b>		-0.000 (-0.728)	-0.000 (-0.715)	-0.000 (-0.687)	-0.000 (-0.726)	-0.000 (-0.673)
<b>Machinery/Equipment Investment in 2003 Dummy</b>			-0.012 (-0.090)			-0.002 (-0.013)
<b>Building/Land Investment in 2003 Dummy</b>				-0.034 (-0.220)		-0.033 (-0.196)
<b>IT Investment in 2003 Dummy</b>					-0.010 (-0.049)	0.001 (0.005)
<b>Constant</b>	3.167*** (5.582)	2.651*** (3.792)	2.655*** (3.774)	2.681*** (3.748)	2.643*** (3.648)	2.682*** (3.556)
<b>N</b>	140	127	127	127	127	127
<b>r2</b>	0.781	0.784	0.784	0.785	0.784	0.785
<b>F</b>	79.002	23.335	21.838	21.849	21.837	19.300

(t-ratios in brackets; \*, \*\* and \*\*\* indicate significance at 10%, 5% and 1% level respectively)

**Table 7: Cobb Douglas Production Functions: First Differences**

	(7)	(8)	(9)	(10)	(11)	(12)
<b>Dependent variable:</b>	<b>Log of change in output per employee (2003/2004)</b>					
<b>dEMPL</b>	-0.462*** (-3.897)	-0.491*** (-3.372)	-0.491*** (-3.354)	-0.491*** (-3.357)	-0.493*** (-3.356)	-0.492*** (-3.317)
<b>dK</b>	0.053 (0.772)	0.047 (0.583)	0.047 (0.570)	0.045 (0.553)	0.046 (0.574)	0.046 (0.555)
<b>dE</b>	0.172* (1.787)	0.193 (1.506)	0.193 (1.497)	0.200 (1.533)	0.193 (1.497)	0.199 (1.511)
<b>dM</b>	0.284*** (4.576)	0.261*** (3.717)	0.261*** (3.664)	0.260*** (3.678)	0.260*** (3.669)	0.260*** (3.608)
<b>Age</b>	-0.007 (-1.503)	-0.008 (-1.324)	-0.008 (-1.296)	-0.007 (-1.272)	-0.008 (-1.325)	-0.007 (-1.265)
<b>Age Squared</b>	0.000 (0.974)	0.000 (1.023)	0.000 (1.007)	0.000 (0.948)	0.000 (1.007)	0.000 (0.942)
<b>Owner European</b>		-0.113 (-0.951)	-0.113 (-0.946)	-0.104 (-0.858)	-0.109 (-0.890)	-0.101 (-0.807)
<b>Owner Asian</b>		0.033 (0.388)	0.033 (0.386)	0.039 (0.442)	0.036 (0.411)	0.040 (0.449)
<b>% Capacity Use</b>		0.000 (0.255)	0.000 (0.253)	0.000 (0.199)	0.000 (0.213)	0.000 (0.158)
<b>Manager Education</b>		0.019 (0.650)	0.019 (0.642)	0.019 (0.655)	0.019 (0.646)	0.019 (0.655)
<b>Export Dummy</b>		0.067 (0.704)	0.067 (0.672)	0.060 (0.603)	0.061 (0.592)	0.058 (0.543)
<b>Foreign Ownership</b>		-0.043 (-0.381)	-0.043 (-0.379)	-0.043 (-0.380)	-0.042 (-0.373)	-0.042 (-0.371)
<b>Monopoly</b>		-0.008 (-0.093)	-0.008 (-0.090)	-0.003 (-0.029)	-0.009 (-0.101)	-0.004 (-0.046)
<b>Foreign Competition Important</b>		-0.032 (-0.348)	-0.031 (-0.345)	-0.030 (-0.325)	-0.032 (-0.355)	-0.031 (-0.333)
<b>Power Outages</b>		0.000 (0.442)	0.000 (0.434)	0.000 (0.409)	0.000 (0.430)	0.000 (0.411)
<b>Bribery</b>		-0.119 (-1.452)	-0.119 (-1.444)	-0.120 (-1.453)	-0.124 (-1.419)	-0.123 (-1.393)
<b>Crime</b>		-0.000 (-1.173)	-0.000 (-1.165)	-0.000 (-1.203)	-0.000 (-1.156)	-0.000 (-1.173)
<b>Machinery/Equipment Investment in 2003 Dummy</b>			0.001 (0.008)			-0.009 (-0.107)
<b>Building/Land Investment in 2003 Dummy</b>				0.030 (0.341)		0.032 (0.328)
<b>IT Investment in 2003 Dummy</b>					0.020 (0.169)	0.014 (0.111)
<b>Constant</b>	0.267*** (3.874)	0.243 (1.269)	0.243 (1.226)	0.232 (1.191)	0.249 (1.272)	0.241 (1.170)
<b>N</b>	125	113	113	113	113	113
<b>r2</b>	0.551	0.577	0.577	0.578	0.578	0.578
<b>F</b>	24.151	7.637	7.137	7.152	7.141	6.303

(t-ratios in brackets; \*, \*\* and \*\*\* indicate significance at 10%, 5% and 1% level respectively)