Financial liberalisation and industrial development in Malawi

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Abstract

It has been suggested that financial liberalisation may be a key policy to promote industrialisation as it removes the credit access constraint on firms, especially small and medium ones. We investigate the effect of credit expansion in the wake of liberalisation on the structure of the industrial sectors in Malawi and find that, in contrast to the hypothesis above, it resulted in an increase in industrial concentration and a decrease in net firm entry, especially in sectors that are more finance dependent. The case of Malawi is interesting because financial liberalisation has been justified precisely as a means for industrial development and because the implementation of the policy has been regarded as relatively successful.

1. Introduction

The importance of developed and stable financial systems for the sustainability of economic growth cannot be over-emphasised. Instead, whether financial sector development can be an engine for growth in developing countries and whether policies for financial development should have priority over other policies are still controversial matters. Rather than concentrating on the cross-country aggregate relationship between financial development and economic growth (which on the whole has produced few conclusive results) much of the more recent research investigates the theoretical mechanisms through which financial development may lead to faster growth.

One of these transmission channels centres on the ability of developed financial market institutions to reduce the cost for firms of raising external finance. This may be the result of greater availability of finance, due to competition among financial institutions, and of the presence of better accounting and disclosure rules and better corporate governance which help firms overcome adverse selection and moral hazard problems (Levine, 1997). Rajan and Zingales (1998) provide support for the working of this channel with their finding that, in countries where financial markets are more developed, industrial sectors that are more dependent on external finance grow faster than less dependent ones. Moreover, in such sectors, the establishment of new firms (which are more dependent on external finance than existing firms) is a more important phenomenon than the growth in the average size of establishments.[1]

More research into this area seems to be warranted on both theoretical and practical grounds. The paper by Rajan and Zingales – as well as much of related research – compares countries at different levels of financial development. In practice, however, policymakers need information on the likely effects of financial liberalisation on the credit access constraint

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[1] This is an additional indirect channel through which financial development can boost economic growth since new firms are more likely to make use of more productive innovative technologies.

experienced by firms. For example, in a liberalised regime, banks, which during financial repression did not develop their risk assessment and management skills, may concentrate their lending to well-established customers rather than financing new establishments (Caprio, 1994). Banking competition, which always accompanies financial liberalisation policies, may not necessarily mitigate this problem since in a competitive environment the importance of relationship lending may increase rather than decrease, because it allows lenders to differentiate themselves from other lenders and gives them a competitive edge (Boot and Thakor, 2000). Moreover, since small and medium firms are more informationally opaque entities, the costs for banks of investing in informational capital to assess the prospects of small and medium enterprises may not be worthwhile (Berger, Klapper and Udell, 2001). These observations suggest that financial institutions may provide credit mostly to larger clients with long-standing relationships thus perpetuating entry barriers especially for those firms that are more external finance dependent. It is therefore theoretically ambiguous whether financial liberalisation relaxes firms' financing constraints and which industrial sectors stand to gain from liberalisation or are more likely to be hurt by it.

This paper adopts a somewhat original approach to investigate the link between financial liberalisation and industrial development. First, it analyses the impact of liberalisation on the degree of industrial concentration and firm entry. If liberalisation boosts financial institutions' lending capacity and makes credit more widely available to firms, it will encourage the creation of new firms. If their entry outweighs the expansion of existing firms – as Rajan and Zingales and others find – the degree of industrial concentration should fall. If, on the other hand, liberalisation privileges larger firms, industrial concentration will rise. It is important to look at both concentration and firm entry since the promotion of entrepreneurship could go hand in hand with stronger growth of existing firms. Second, this paper uses panel data for a single country (where the cross-sectional units are the various

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manufacturing sectors) rather than following a cross-country approach, which requires demanding assumptions about the universality of the process being modelled. The country we analyse is Malawi. We argue below that the experience of this country is meaningful for a study on the liberalisation-industrial development relationship.

The structure of the paper is as follows. The next section reviews the literature on the effect that financial system deepening may have on a country's industrial structure. This section provides the motivation for this study and for the choice of Malawi as the country of analysis. Section 3 describes the empirical approach. Section 4 presents and discusses the empirical results. Section 5 concludes.

2. Financial liberalisation and industrial structure

Three different strands of the literature are related to our paper. The first strand highlights the heterogeneity of industrial sectors and suggests that financial development will have different effects on the various sectors' rates of growth depending on their characteristics.

The seminal contribution in this strand is the paper by Rajan and Zingales cited above. These authors adopt an original perspective, which has since inspired many other contributions in the field and is based on the distinction between industrial sectors that require external sources of finance to fund their investment plans and those which use internally generated resources. This distinction, according to Rajan and Zingales, is not country specific but arises from technological constraints which are always valid regardless of the institutional context. In other words, the set up costs of a firm in a specific industry are to a large extent determined by the industry-specific technological needs; firms in an industry which requires costly technology would be more dependent on external finance than firms in an industry where technology is less expensive. According to this reasoning, firms in tobacco or leather,

for example, would always be less dependent on external finance than firms in the pharmaceutical or the computing sector. Hence, Rajan and Zingales maintain that this ranking of industrial sectors in terms of their degree of dependence from external finance is likely to be valid across countries.

Having made this distinction between sectors more or less dependent on external finance, Rajan and Zingales go on to show that, in their sample of 36 industries in 41 developed and developing countries, greater financial development would disproportionally benefit the firms in the sectors that are more external finance dependent. Using a slightly different sample and approach, Beck and Levine (2002) find the same result. The explanation is that, since financial repression tends to restrict access to bank credit and, therefore, firms more dependent on external finance face a financial constraint that is especially severe compared to firms that are less external finance dependent, the former type of firms would gain much more than the latter from financial development and greater access to credit. Hence, industrial sectors in which firms are more external finance dependent will grow faster in countries with greater financial development. According to these studies, therefore, financial development reduces the cost of external finance for firms. This effect, which is felt primarily by firms more dependent on external finance, may go undetected in analyses that concentrate exclusively on the search for average effects.

Rajan and Zingales also find that, in the sectors that are more external finance dependent, industrial growth appears to be driven by the growth in the number of new firms rather than the growth in the average size of existing establishments. Similarly, Beck and Levine (2002) using industry-level data and Klapper, Laeven and Rajan (2006) using firm-level data in a sample of European firms show that greater financial development is associated with higher entry in more financial dependent industries. This finding is explained by the fact that new firms depend more on external finance than established firms.

The literature has also analysed whether financial development may have different effects on large or small firms. Using the insight in Kumar, Rajan and Zingales (1999) that due to production technologies – including capital intensities and scale economies – firms in each industrial sector will have an optimal size, Beck et al. (2008) find in their cross-country, cross-industry study that industries where the optimal firm size is small grow faster in economies with more developed financial systems.[2] They speculate that financial development lowers information and transaction costs, which are particularly high for small firms and prevent their access to financial services. Small firms, therefore, are those that benefit the most from financial liberalisation and development. Using firm-level data from the World Business Environment Survey on obstacles to performance – such as restricted access to finance, corruption and legal obstacles – perceived by firms in 74 developed and developing countries, Beck, Demirguc-Kunt and Maksimovic (2005) conclude that small firms are adversely affected by these obstacles much more significantly than large firms. They suggest that financial development should be particularly beneficial for small firms.

Overall this strand of the literature provides favourable evidence that financial development has a positive impact on industrial development by relaxing external finance constraints on firms, encouraging firm entry and benefitting especially smaller firms. A second strand of the literature looks at the impact of financial deepening on firms' financing constraints from a different perspective: it analyses whether financial deepening is associated with reduced sensitivity of firms' investment to the availability of internal funds and, unlike the previous literature strand, investigates how developed financial systems compare to less developed ones as well as the impact of financial liberalisation in a single country setting. Empirical studies in this area have produced mixed results. These are partly explained by the fact that the impact of liberalisation on firms would depend on whether large or small firms

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[2] While they find an insignificant correlation between the industrial sectors' small firm share and external finance dependence, Beck et al. (2008) confirm the finding by Rajan and Zingales (1998) that external finance dependent sectors grow faster in countries that are more financially developed.

enjoyed preferential treatment in the pre-reform period and partly by the fact that small firms face asymmetric information problems which are intrinsic to them and may not necessarily be alleviated by financial deepening.

Love (2003), using firm-level data for 36 developed and developing countries from the Worldscope database – which contains data on large, publicly traded firms – finds that financial development effectively relaxed financing constraints on firms' investment. Moreover, her empirical analysis shows that financial development disproportionally benefitted the smaller firms in the sample. Her hypothesis is that, compared with large firms, small firms face greater informational asymmetries and tighter financing constraints in less financially developed countries. Laeven (2003) uses the same approach as Love (2003) but finds that, in his sample of 13 liberalising developing countries, financial liberalisation did not reduce the financing constraints of all firms but only of small ones; for large firms, financing constraints increased after liberalisation. The reason for this result is that, following deregulation, large firms lost preferential access to directed credit. A number of other studies also reach the conclusion that liberalisation relaxes the financing constraint especially for small firms, see for example Gelos and Werner (2002) for Mexico; Harris, Schiantarelli, and Siregar (1994) for Indonesia; Koo and Maeng (2005) for Korea; and Ghosh (2006) for India.

On the other hand, in the case of India, Bhaduri (2005) finds that while financial liberalisation had no significant impact on the financial constraints faced by large firms those on small firms intensified on two accounts, namely, the reduction in preferential credit allocation in favour of small firms and asymmetric information problems, which are more acute for small firms and have a greater impact on bank lending decisions in a deregulated regime. Jaramillo, Schiantarelli and Weiss (1996) find that financial liberalisation in Ecuador did not change the strength of the financial constraints on firms' investment: small firms were constrained both before and after liberalisation while large firms were not constrained in

either. Similarly, for the case of Chile, Hermes and Lensink (1998) report that reforms did not improve small firms' access to external finance. Such diversity of experience among individual countries seems to suggest that cross-country studies could generate misleading results.

The third strand of the literature related to this paper considers the effect of banking sector structure – in particular banking competition – on the supply of credit. While financial liberalisation in developing countries is accompanied by a relaxation of the rules governing bank entry, this literature compares the strength of firms' financing constraints in systems where banking sectors have different degrees of concentration rather than how those constraints are affected by regime changes where the banking sector becomes less concentrated as a result of financial liberalisation and bank entry deregulation. Both theoretically and empirically this literature gives rise to conflicting results.

A large part of this literature provides evidence that bank competition makes credit more widely available to firms, benefitting in particular smaller ones and potential entrants. More firm entry leads to lower average firm size and fosters industrial competition. Cetorelli and Strahan (2006) show that increased bank competition in the U.S. has led to an increase in the number of establishments and to a reduction in average establishment size especially in sectors that are more financial dependent. Greater competition, however, appears to have had no effect on large firms' access to financial resources since these firms can also access security markets. Cetorelli (2003) shows that, in U.S. regions with more banking concentration, industrial sectors are characterised by less entry of new firms and delayed exit of older firms. In a sample of 35 manufacturing sectors in 17 OECD countries, Cetorelli (2001) finds that in countries with more concentrated banking systems the average firm size in sectors that are more dependent on external finance is larger than in other sectors. In countries where financial markets are more developed, this effect of bank concentration

remains significant but is much weaker, since access to alternative sources of finance reduces the impact of the banking sector on the industrial structure. Using survey data from the World Business Environment Survey, Beck, Demirguc-Kunt and Maksimovic (2004) report that financing obstacles are greater in more concentrated banking systems, especially for small and medium enterprises. This relation, however, is only found in low income countries and it disappears with higher institutional and economic development.

By contrast, another part of this literature argues that bank concentration may provide more credit for firms. While noting that greater bank concentration may lead to lower entry and greater concentration in the industrial sector, Da Rin and Hellmann (2002) argue that banks can play a catalytic role for industrialisation and growth only if they have a degree of market power which allows them to earn sufficient profits. Using a sample of 41 developed and developing countries, Cetorelli and Gambera (2001) find that, although bank concentration lowers industry growth on average, its impact on the various industrial sectors depends on their characteristics. In particular, industries that are more external finance dependent (especially the younger firms in those sectors) have greater access to credit and grow faster when the banking sector is concentrated. Moreover, in these sectors, bank concentration leads to a faster growth in the number of establishments, thus rejecting the argument that bank concentration may enhance industry concentration by providing credit only to well-established clients. Petersen and Rajan (1995) find that young firms appear less financially constrained when banking markets are more concentrated. While their empirical analysis concentrates on small businesses in the U.S., the theoretical explanation for their finding may apply to larger firms as well. They argue that bank competition hinders the formation of close lending relationships between banks and firms and reduces the provision of long-term finance. In a competitive environment it is more difficult for a bank to subsidise new borrowers in earlier periods since it may not be able to claim a share of the rents in future

periods. The importance of relationships for the provision of banks' finance to small U.S. firms and the negative effect that bank competition may have on such provision are also found in Cole (1998), Cole, Goldberg and White (2004) and, for major industrialised countries, in Mayer (1988 and 1990). Petersen and Rajan (1995) conclude that in the early stages of a country's economic growth, when there are comparatively few established firms and their access to finance is most important, it may be preferable to restrict interbank competition. Aryeetey *et al.* (1997) report that financial liberalisation in some sub-Saharan African countries and greater banking competition did not lead to any significant reduction in the financial constraints for domestic firms, as banks concentrated their lending on large manufacturing firms. Kariuki (1995) provides evidence from survey data that access to credit by small and medium enterprises in Kenya declined after liberalisation.

However, as noted by Cetorelli (2001), the existence of a positive relationship between bank concentration and access to credit by young firms generates theoretically ambiguous implications for the extent of industrial competition. One possibility is that once a bank has established lending relationships with an incumbent firm it would not be in the interest of the bank to finance new entrants, since the increase in industrial competition would reduce the profitability of the incumbent and of the bank itself. Thus, bank concentration can be expected to lead to greater industrial concentration. By contrast, it is possible for bank concentration to result in greater industrial competition if banks always foster entry on the basis that new entrants are likely to be endowed with newer technologies and undertake higher return projects which raise bank profitability.

In this paper we intend to examine whether financial liberalisation results in a relaxation of the credit access constraint faced by firms and, in particular, by firms in more external finance dependent sectors and small firms. Since the literature reviewed has yielded somewhat conflicting finding, we regard this as a worthwhile endeavour. We treat this

research question as essentially empirical because, as mentioned in this literature review, theoretical frameworks leading to opposite conclusions have already been formulated.

Our empirical approach has distinctive features. The first is that we attempt to capture the effect of financial liberalisation on industrial concentration, rather than on sectoral value added growth, investment or average firm size as is often the case. The existence of change patterns determined by financial liberalisation in the degree of concentration of industrial sectors gives information on the type of firms mostly affected by the liberalisation policy. Interestingly, the three strands of the literature reviewed above use the results of analyses of firm entry and firm size to draw implications for industrial concentration rather than analysing industrial concentration directly.[3] We also investigate whether financial liberalisation has an effect on firm entry since an increase in industrial concentration may be consistent with a tighter financial constraint on small firms or with its relaxation (if larger firms obtain relatively greater access to credit). The former case would be reflected in fewer firm entries, the latter in more.

The second feature of our empirical approach is that the analysis of concentration and firm entry is performed in a panel data context for a single country, with the industrial sectors as the cross-sectional units. Our literature review has highlighted that the impact of financial deepening on firms' financial constraints often depends on the characteristics of the pre-liberalisation regime, especially whether large or small firms were granted preferential access to credit during repression. Moreover, the strength of financing constraints has been found to also vary according to the individual countries' characteristics of the institutional context and in particular of the legal system, the extent of corruption, and other factors, which, despite significant research, are not accurately captured in a cross-country setting.

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[3] It is worth noting that the literature on industrial concentration, which we have not reviewed in this paper, has by and large disregarded the role of financial liberalisation as one of its possible determinants.

We have chosen to concentrate on Malawi. This is not just due to the fact that one of us is Malawian. Instead, the case of Malawi is interesting for two reasons. The first is that the World Bank identified financial sector reforms as the key to growth and development of the manufacturing sector in Malawi (World Bank, 1989).

Given its relatively small manufacturing sector, industrialisation has been an explicit policy objective since the attainment of independence in 1964 but government efforts had in general not been very successful. Beginning in 1981, Malawi embarked on wide-ranging policy reforms with the support of various structural adjustment and sectoral adjustment loans from the World Bank. Some of these policies specifically aimed to stimulate competition and growth in the manufacturing sector, such as industrial licensing deregulation, industrial price decontrol, abolition of exclusive monopoly rights, establishment of export processing zones, corporate tax incentives and reduction in income tax, and broad-based privatisation of public enterprises (World Bank, 1994, 1996). However, the performance of the manufacturing sector fell short of expectations. It is in this context that the World Bank (1989) identified financial sector underdevelopment as a continuing impediment to the growth and development of the manufacturing sector. Consequently, after several financial sector studies, a wave of financial sector reforms began.

While lending and deposit interest rates were deregulated in 1987 and 1988 respectively, it is in 1989 that new legislation deregulated entry of new banks into the financial system and gave the central bank a supervisory role, including the assessment of applications for entry by new institutions. The objective of this legislation was to reduce the monopoly powers hitherto enjoyed by the dominant commercial banks and to promote competition in the financial sector by introducing the market mechanism in the resource allocation process and creating a competitive environment in saving mobilisation and intermediation (Nissanke and Aryeetey, 1998; World Bank, 1991). These reforms were

expected to lead to the growth of small and medium enterprises by making credit more widely available to them.

The second reason why the case of Malawi is interesting is that the implementation of financial liberalisation in Malawi has been generally regarded as successful, especially in improving financial system intermediation and competitiveness. In their assessment of 29 sub-Saharan African countries' experiences with financial liberalisation, Reinhart and Tokatlidis (2003) conclude that Malawi is in the small group of countries that register "more advanced" progress in financial development following financial liberalisation. Chirwa (1998) finds that financial liberalisation in Malawi has led to an increase in financial depth – a finding corroborated by Aryeetey et al. (1997) and Nissanke and Aryeetey (1998) – and a decline in monopoly power within the banking system. Analysing financial development in 38 sub-Saharan African countries, Gelbard and Pereira Leite (1999) report that Malawi has its best performance in the area of "market structure and competitiveness of the financial system." It should also be noted that Malawi is one of a relatively small number of developing countries where financial liberalisation has not been followed at some point by a banking or financial crisis. Hence, the case of Malawi appears particularly suitable for an analysis of the relationship between financial sector liberalisation and industrialisation.

3. Financial liberalisation and industrialisation: The empirical approach

The ultimate aim of this study is to investigate the impact of financial liberalisation on industrial concentration and firm entry. We are also interested to ascertain whether financial liberalisation has a greater impact on industrial sectors that are more external finance dependent. To investigate these issues we adopt various approaches. Our initial analyses have a temporal and a comparative nature. In particular, the temporal analysis is a before-after type of analysis in which we analyse the behaviour of selected economic variables before and after

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financial liberalisation. The comparative analysis is a control-group type of analysis in which we compare the behaviour of industrial concentration and firm entry in different industrial sectors, grouped according to their degree of external finance dependence. Later in the paper we adopt a panel regression approach, in which we control for the effect of other variables, besides financial liberalisation, on industrial concentration and firm entry.

3.1. The before-after approach

We use this approach to describe the evolution of selected variables during the period of financial liberalisation and to evaluate the statistical significance of their changes compared with the pre-liberalisation period. The variables measure various aspects of the Malawian economy and of the industrial and financial sectors, including in particular industrial concentration and net firm entry. In order to account for the short and the long-term effects of liberalisation we split the post-reform period into two shorter periods.

We implement the before-after approach by running OLS regressions in which each variable is regressed on time dummies for each reform period. The estimated model is:

$$y_t = \gamma + \sum_k \beta_k \tau_k + u_t \qquad (1)$$

where y is the variable of interest; γ is the mean value of y in the pre-reform period; τ are time dummies for each reform period k and u is the error term. The estimated coefficients β represent the difference between the value of variable y in the reform period and its mean value in the pre-reform period.

We set the lengths of the pre-reform, short- and long-run reform periods to 5 years each. While this is arbitrary, it makes sense that the length of the period should be chosen so that the values of the variables selected are not overly affected by the particular phase of the business cycle. Given these lengths of pre- and reform periods, the overall time period t is from $T-5$ to $T+9$, where T denotes the first year of liberalisation. We take it to be 1989,

corresponding to the deregulation of bank entry opening up the banking sector to competition.[4]

It is a well-known weakness of the before-after approach that it attributes the entire change in the variables of interest to the policy change under consideration – in this case, financial liberalisation. Nonetheless, this approach gives information on whether financial liberalisation is associated with significant changes compared with the pre-reform period.

3.2. The control group approach

As we are interested to investigate whether the effect of financial liberalisation on the manufacturing sector may depend on the degree of financial dependence of firms in the various sectors of activity, we divide the industrial sectors into three groups j – namely, high finance dependent, medium finance dependent and low finance dependent sectors. To do so, we first rank the sectors on the basis of our external finance dependence index (described below in Section 3.4) and we then split the distribution at the 25th and 75th percentile.[5] The composition of the three groups is shown in Appendix A. We use the control group approach to investigate whether changes in industrial concentration and net firm entry between the period preceding financial liberalisation and the reform period differ according to the degree of financial dependence of the industrial sectors. The low finance dependent sectors constitute the control group, whose performance is compared with that of high and medium finance dependent sectors. The estimated model is:

$$y_{it} = \gamma_j + \sum_k \beta_k \tau_k + \sum_k \beta_k^H \tau_k d^H + \sum_k \beta_k^M \tau_k d^M + u_{it} \tag{2}$$

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[4] Chirwa and Mlachila (2004) also take 1989 as the beginning of the financial liberalisation period.
[5] Since the classification of industrial sectors into the three groups is to some extent arbitrary, we have chosen to let 50 percent of the sectors fall into the middle group in order to increase the separation between the high and low dependence groups and reduce the likelihood that an eventual finding of different behaviour of these two groups may be spurious and attributed to an incorrect classification of the sectors.

where i denotes the 20 sectors in Malawi's manufacturing industry; γ_j is the mean value of y in the pre-reform period for group j; d^H and d^M are dummies for high and medium dependent sectors respectively. The statistical significance of the estimated coefficients β^H and β^M indicates whether the changes in variable y between the reform and the pre-reform period for the medium and high financial dependent sectors are different from those of the low finance dependent sectors.

The main shortcoming of the control group approach is that the degree of financial dependence is taken as the only characteristic differentiating the various industrial sectors, so that differences in performance are attributed exclusively to the greater or smaller degree of financial dependence, when performance (and, in particular, the degree of concentration and net firm entry) is potentially affected by a host of other factors. We address this problem by adopting a regression approach, as described in the next section. Nonetheless, despite this shortcoming, the control group approach provides some information on whether more financial dependent sectors do better than less financial dependent sector following financial liberalisation.

3.3. The regression approach

By adopting the regression approach we address the shortcomings of both before-after analyses (where it is assumed that determinants of industrial concentration and firm entry other than financial liberalisation remain unchanged between the pre-reform and reform periods) and control group analyses (where it is assumed that industrial sectors differ from one another only for their degree of financial dependence). With the regression approach, we account for the role of various determinants of industrial concentration and firm entry. The estimated model is the following:

$$y_{it} = \alpha y_{i,t-1} + \sum_m \beta_m x_{mit} + \gamma_i + \tau_t + u_{it} \tag{3}$$

where y is industrial concentration in some regressions and firm entry in others; x denotes a set of m determinants of y including, in particular, financial liberalisation; γ is a sector-specific fixed effect (e.g. initial efficiency); τ is a set of period dummies, which is included to account for shocks common to all industrial sectors; u is the error term. The lagged level of y is included as a regressor to account for persistence in industrial concentration and firm entry. It can also be taken to represent factors that, although not modelled explicitly, may have influenced concentration and entry in the previous period. The sample period is from 1970 to 2004. To filter out at least to some extent business cycle fluctuations we have grouped observations into five-year periods.

The appropriate approach for the estimation of dynamic models with a short time dimension such as (3) is the system generalised method of moments (sys-GMM) estimator (Blundell and Bond, 1998). This approach allows for inertia in the dependent variable, potential endogeneity of the explanatory variables, and unobserved sector-specific effects.[6] The system comprises a difference equation, which is obtained by first-differencing (3), together with a level equation, i.e. equation (3) itself. The instruments used in the estimation are internal: in the difference equation, the instruments are levels of the series lagged two periods or more while, in the equation in levels, the instruments are lagged first-differences of the series.[7]

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[6] The model allows for weak exogeneity of the explanatory variables, which means that the current values of the explanatory variables can be correlated with current and previous realisations of the error term but not with future realisations. This implies that future unexpected shocks to industrial concentration and firm entry do not influence current realisations of the determinants of concentration and firm entry.

[7] Given that lagged levels are used as instruments in the differences specification, only the most recent difference is used as instrument in the levels specification. Using the other lagged differences would result in redundant moment conditions.

The validity of the instruments, which is necessary for consistency of the GMM estimator, is tested as usual by means of the Hansen-*J* test[8] (which tests the exogeneity of the instruments as a group) and the test for the absence of second-order serial correlation of the errors in the difference equation (the presence of autocorrelation would indicate that some lags of the dependent variable, which might be used as instruments, are in fact endogenous and, hence, bad instruments).[9]

Since a high number of instruments can give rise to an over-fitting bias, we reduce their number by combining them through addition into smaller sets (Roodman, 2009).[10] We report the results of system GMM estimation based on the two-step estimator with the finite-sample correction proposed by Windmeijer (2005).[11]

3.4. Variable selection: concentration, net firm entry and financial variables

Industrial concentration in each sector i is measured by the log of the 3-firm concentration ratio, which is the cumulative share of total value added of the three largest firms in the sector:[12]

$$Concentration_i = \sum_{j=1}^{3} VA_j / VA_i$$

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[8] The Sargan's statistic is a special case of Hansen's *J* under the assumption of homoscedasticity.

[9] This is equivalent to testing for first order serial correlation of the errors in levels. By construction, first-order serial correlation is expected in the differenced error term even if the error term in levels is not autocorrelated.

[10] This operation is performed by the "collapse" command in Stata. Collapsing turns the instrument count into a linear function of the number of observations rather than quadratic.

[11] While the two-step estimator is asymptotically more efficient than the one-step estimator, the estimated standard errors are severely biased downwards in a finite sample. For this reason, researchers have traditionally preferred to use the one-step estimator. However, Windmeijer (2005) derives a finite-sample correction of the two-step covariance matrix which makes the two-step estimator more efficient than the one-step variant even in a small sample.

[12] Selecting the three largest firms as opposed to another number is a common, albeit arbitrary, choice. Moreover, it should be considered that in Malawi industrial sectors are characterised by the presence of very few producers and therefore concentration ratios above three firms – such as five firms, which is often used – would equal 100 percent in some sectors. Another measure of concentration that is often used is the Hirschman-Herfindahl Index; however, we did not have access to the firm-level data that are required for its calculation. In any case, empirical studies have shown that the various concentration measures are highly correlated and provide similar findings (see, for example Curry and George, 1983).

Firm entry data are not available. In this paper we use the growth rate of the number of firms as a proxy for (net) firm entry, since this variable reflects the relative frequency of entries and exits from the industry.[13]

To examine the role of financial development and liberalisation on industrial concentration and firm entry we create a number of variables that we enter sequentially in our regressions. The measure we use for financial development is the ratio of credit to the manufacturing sector granted by commercial banks as a percentage of GDP. This ratio is meant to capture an economy-wide effect of financial deepening on industry concentration and firm entry. To investigate whether greater financial intermediation affects the various industrial sectors differently, we generate a new variable by interacting the ratio of credit to the manufacturing sector with a measure of external finance dependence of each sector. This new variable is therefore sector specific and may be used to examine whether greater access to credit is associated with a significant impact on industrial concentration and firm entry in the sectors that are relatively more dependent on external finance. To test whether financial reforms have altered the impact of credit access – especially in more finance dependent sectors – on concentration and firm entry, we create further two variables by multiplying the two financial variables just described – the manufacturing credit to GDP ratio and its interaction with the indicator of external finance dependence – by the financial liberalisation dummy. This equals one from 1989 onwards and zero otherwise. For robustness and to allow for gradual reform implementation we also use an alternative financial liberalisation dummy, which equals zero until 1988, one from 1989 to 1993 and two thereafter.[14] This reflects the fact that, while the major financial reforms – such as interest rate deregulation, the elimination

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[13] Sometimes this variable is included as a determinant of industrial concentration; other studies criticise such inclusion since changes in the number of firms reflect the impact of economic forces which should have already been taken into account into the concentration regression. We have decided to remove this variable from our concentration regressions since its coefficient was never significant and its removal was inconsequential for the other results.
[14] Chirwa and Mlachila (2004) too date the consolidation of financial liberalisation in the period beginning in 1994.

of directed credit allocation, the overhaul of the legal framework for the financial sector, which resulted in the restructuring of the existing institutions and facilitated the entry of new financial institutions – took place in the 1989-93 period, the subsequent period saw a series of follow-up reforms – such as the shift from direct to indirect, market-based instruments of monetary control, and the adoption of a more market-determined exchange rate regime – which served to consolidate the liberalisation process.

A measure of external finance dependence of the different industrial sectors was put forward by Rajan and Zingales (1998). Using firm-level data and assuming that the supply of credit is infinitely elastic so that access to external finance is demand driven, they define the external finance dependence of firms as the share of capital expenditures that is not financed through internal cash flows. This is computed as capital expenditures minus cash flow from operations, divided by capital expenditures, where cash flow from operations is broadly defined as the sum of cash flow from operations plus decreases in inventories, decreases in receivables, and increases in payables. The median value of finance dependence of the firms in a sector is then taken as the measure of external finance dependence in that sector.

Rajan and Zingales employ data from Standard and Poor's Compustat for United States firms and, as mentioned in Section 2, they assume that each sector's degree of financial dependence is mainly determined by structural/technological reasons and, therefore, the ranking of sectors according to their financial dependence is valid in all countries. We are doubtful of the universality of this ranking for at least two reasons. First, for strategic reasons such as trade or food security, many developing countries support certain industries through subsidies; as a result, these industries are less dependent on external finance than those without state support. Second, capital expenditure data may underestimate the true level of firms' external finance dependence. With regard to Malawi and other sub-Saharan African countries, Nissanke (2001) notes that the unstable and high-risk political and economic

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environment has significantly affected not only the asset composition of the savings portfolio held by private agents but also the composition of private investment in Africa, favouring reversible and safe investments that have a self insurance character. Thus, borrowing is more related to commerce and trading activities than long-term capital investments.

Von Furstenberg and Von Kalckreuth (2006) cast serious doubts on the empirical validity of the Rajan and Zingales measure of external finance dependence. Firstly, using an alternative source of data to that used by Rajan and Zingales, they find that the values of external finance dependence obtained by Rajan and Zingales do not adequately represent financing conditions in the various manufacturing sectors even in the United States, the country from which they are derived.[15] Secondly, Von Furstenberg and Von Kalckreuth fail to find support for the assumption made by Rajan and Zingales that the differences between the degrees of financial dependence can be attributed to structural/technological characteristics intrinsic to the various sectors. These findings invalidate the ranking of sectors proposed by Rajan and Zingales and its applicability to other countries.

We have therefore decided to construct an alternative measure of financial dependence to that provided by Rajan and Zingales. Our measure is based on industry-level (three digit ISIC) data on credit extended by the banking system for the period 1996-2002 – the length of the period is dictated by data availability – and, unlike the Rajan and Zingales *theoretical* indicator of financial dependence, it allows the ranking of Malawian industrial sectors according to their *actual* dependence from external finance. Our external finance dependence ratio is defined as the share of total capital expenditure (fixed plus working capital) that is not financed through internal cash flows. In appendix 1 we compare the ranking of industrial sectors according to their degree of financial dependence provided by Rajan and Zingales with the ranking obtained by using our own index of financial dependence. We show that the

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[15] Their data are from the Bureau of Economic Analysis, U.S. Department of Commerce. They are relative to all establishments in each sector. By contrast, the Campustat data used by Rajan and Zingales refer to the median exchange-listed firm in each sector.

two rankings are statistically different. For robustness, the regressions are re-run with their ranking.

3.5. Variable selection: the control variables in the industrial concentration regressions

The lagged concentration ratio is included in the industrial concentration regressions to reflect the fact that adjustment towards equilibrium is likely to be gradual. The sign of the expected coefficient, however, is not theoretically obvious *a priori*. Stigler (1952) argues that leading firms in highly concentrated industries are likely to lose market shares over time since their profits will encourage entry, which in turn will lower industrial concentration in the long run. On the other hand, Bain (1966) contends that incumbent firms may set a low 'limit price' so that the resulting low profit rate would discourage potential entrants. This may even increase industrial concentration if prices are so low that they drive small firms out of business.

Industry growth – which we measure by the growth in the ratio of value added in each sector to GDP – is likely to affect concentration negatively, since it provides potential profit opportunities to new entrants.

Industry size – measured by the share of sectoral value added in total manufacturing value added – may have a positive effect on entry decisions since a large size reflects the sector's potential to absorb additional capacity creation. If displacement – the phenomenon whereby new entrants force incumbents' exits – is important, concentration might fall.[16]

International trade is expected to be an important determinant of industry concentration. It is all the more important to account for the role of international trade in our study since financial reforms have been accompanied by the implementation of trade reforms. We include two trade variables in our regressions because imports and exports may have

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[16] In high concentration industries, however, Shapiro and Khemani (1987) observe that, if entrants are small, they are likely to replace other small incumbents thus leaving concentration broadly unchanged.

different effects. Import intensity – which we measure by the growth of the ratio of manufactured imports to total imports – is a sign of greater competition from foreign producers, which is likely to limit the oligopolistic power of existing firms and reduce industrial concentration.[17] Moreover, to the extent that the increase in manufactured imports reflects greater availability of imported inputs for domestic producers, import liberalisation may result in higher firm entry, which could also reduce concentration.

Greater export intensity – which is measured by the growth of the ratio of manufactured exports to total exports – is associated with a larger market size for exporters. If economies of scale are important and/or the costs of entering export activities are high, the degree of industrial concentration is expected to rise.

3.6. Variable selection: the control variables in the net firm entry regressions

Lagged net firm entry is included to allow for gradual adjustment of entries and exits in response to changes in their economic determinants. According to Geroski (1995) and Cincera and Galgau (2005) firm entries and exits tend to come in waves. Similarly, Johnson and Parker (1994) and Hannan and Freeman (1989) suggest that there may be a multiplier effect, whereby entry causes future entry (and retards future exits) and/or exits cause future exits (and retard future entry). Gort and Konakayama (1982) argue that the perceptions of profit opportunities by entrants are positively related to the successful experience of those that have operated in that market before.

Industry growth, defined as above, is an important factor in both entry and exit decisions since it provides a picture of the opportunities available to those entering or staying in the business.

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[17] Theoretically, foreign competition may result in greater concentration as it drives some producers out of business. However, in our regressions, the coefficient of import intensity turned out to be negative.

Profitability of an industry is a potent force encouraging industry entry. We measure profitability by the price-cost margin, which is defined as total value added minus labour costs divided by the sum of total value added and the cost of materials. It should be noted that, empirically, regression analyses in this area have often uncovered a negative relationship between net firm entry and profitability. This could be explained either by the incumbents' oligopolistic power to effectively blockade entry and/or force competitors to exit (Duetsch, 1975; Shapiro and Khemani, 1987) or by the presence of strong displacement effects leading to greater exits than entries in high profitability industries (Shapiro and Khemani, 1987).

The state of the economy (which we measure by real GDP growth) affects the anticipated profitability of firms and, hence, impacts on their entry and exit. The expected sign, however, is ambiguous. A favourable state of the economy may induce net entry but it is equally possible that far-sighted entrepreneurs would see in a downturn in economic activity the opportunities to enjoy lower labour and equipment costs or to exploit the creation of attractive market niches following business failures (Highfield and Smiley, 1987; Storey, 1991).

The availability of imported inputs may be an important factor generating industry entry. On the other hand, stronger competition from imports may force domestic firms out of business. We use import intensity, defined as above, to control for these effects on net firm entry.

Both in the industrial concentration and the net firm entry regressions we include time dummies in order to allow for shocks affecting simultaneously all industries, such as changes in the general economic policy environment.

4. Empirical results

Table 1 reports a summary of before-after and control group analyses. The financial sector variables describe some of the effect of financial liberalisation. Credit to the private sector and to the manufacturing sector grew very strongly compared to the pre-reform period; the same can be said for the depth of banking sector intermediation and the share of commercial banks' assets in total bank assets. One should also note, however, the growing holdings of government bonds by commercial banks as well as the increasingly large spread between the Treasury bill rate and the bank lending rate.

<u>Insert Table 1 here</u>

The performance of the manufacturing sector in the reform period has been very disappointing. The share of manufacturing value added to GDP even dropped relative to the pre-reform period, though the drop is not statistically significant. Both the investment to GDP ratio and the rate of growth of GDP registered a small, not statistically significant increase.

Industrial concentration is generally high in Malawi due to the dualistic structure of the industrial sector with small-scale enterprises co-existing with a small number of relatively large-scale modern plants, mostly dominated by public enterprises and multinational affiliates. The micro, small and medium scale enterprises constitute a relatively small segment of the industrial sector, both in absolute terms and in relation to the formal manufacturing sector. The average concentration of industrial sectors increased very significantly following financial reforms both in the short and the long run. The average figures, however, hide important differences among the different industrial sectors. When sectors are classified in the three categories of low, medium, and high external finance dependence, the group of sectors with low dependence is the only one to record a fall in concentration, albeit small and not significant in the long run. In the sectors with medium or high financial dependence, concentration rises significantly.

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Net firm entry fell significantly both in the short and the long-run post-reform period. When the analysis accounts for the different degrees of sectoral dependence from external finance the results show that the overall fall in firm entry is due to the performance of medium and high dependence groups. In the low dependence group net firm entry increases.

The changes in industrial concentration and firm entry just described could, however, have been determined by a host of factors other than financial deepening. With the regression approach we attempt to control for these other factors. Regression results for industrial concentration are reported in Table 2. The control variables, which are identified as theoretical determinants of industrial concentration, turn out to be all significant at conventional levels. Concentration adjusts sluggishly to the long-run equilibrium levels. The positive sign of the lagged concentration coefficient may be taken as reflecting the oligopolistic nature of industry in Malawi and the continuing privileged position of large firms. The relative size of industrial sectors appears to have a moderately negative effect on industrial concentration. Sectoral growth also reduces concentration. The increases in exports and imports have respectively a positive and a negative effect on concentration. The former reflects the fact that access to the export markets allows successful firms to enjoy economies of scale and establish a dominant position in their sector of activity. In principle, the impact of imports on concentration may be due to firm entry and expansion following greater availability of imported inputs. However, in the case of Malawi, it is likely that the main explanation for the drop in concentration, *ceteris paribus*, is the intensity of import competition, which has led to the closure of major manufacturing enterprises, including those in the export sector (this is the so-called Vanek-Reinert effect).[18]

Insert Table 2 here

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[18] The Vanek-Reinert effect strictly refers to industrial sectors rather than firms within sectors, though it can be extended to the latter. It predicts that premature trade liberalisation will cause the most advanced sectors in the least advanced country to die out first. The reason is that the importance of increasing returns in these sectors implies that they are most vulnerable to the drop in volume caused by competition from abroad (Reinert, 2007)

The variables of interest for this paper are those reflecting access to finance. When this is measured by the percentage of total credit given to the manufacturing sector, the finding in column (1) of Table 2 is that an increase in the latter is associated with an increase in concentration. This result suggests that credit tends to be made available first ad foremost to the largest, well-known and possibly politically influent firms. It is, however, equally possible that the estimated coefficient may be giving a distorted picture of the effects of greater access to credit due to the fact that the RHS variable does not explicitly account for the effects of the financial liberalisation policy started in the 1980s. We have generated, therefore, a new RHS variable by interacting the percentage of total credit given to the manufacturing sector with the financial liberalisation dummy. The results obtained by including this additional regressor, which are reported in column (2), confirm that following financial liberalisation the increase in credit to the manufacturing sector has been associated with greater industrial concentration.

This is, however, an average effect, which does not differentiate between industrial sectors. In particular, we wish to test whether sectors that are more dependent on external sources of finance are affected differently compared with less external finance dependent sectors. We generate two extra variables: the first is obtained by interacting the percentage of total credit given to the manufacturing sector with our measure of the degree of external finance dependence of each industrial sector based on Malawian data. The second extra variable is obtained by multiplying the new variable just described by the financial liberalisation dummy. The regression results, which are reported in columns (3) and (4), show that the rise in concentration following the increase in credit to manufacturing is greater in sectors that are more external finance dependent and that this is especially the case after financial liberalisation.

Results of net firm entry regressions are reported in Table 3. The choice of control variables appears sound, as the selected variables are almost always significant. Firm entry

and exit adjust sluggishly to their long-run equilibrium levels. The positive sign of the coefficient of the lagged dependent variable is consistent with the wave/multiplier view of firm entry and exit dynamics. Sectoral growth stimulates entry; however, when this is controlled for, industry profitability appears to be negatively related to net firm entry, probably reflecting the incumbent firms' oligopolistic behaviour. The regression results also suggest that entrepreneurs are forward looking and able to identify profit opportunities which may become available in an economic downturn. Greater availability of imports is positively related to net firm entry.

***Insert Table 3 here**

The variables of interest in this paper are those that reflect firms' access to finance. The results show that greater access to finance does not result into larger net firm entry; its negative impact on the latter is more pronounced after financial liberalisation and is felt disproportionately in the industrial sectors that are more dependent on external finance. This is consistent with the finding that industrial concentration rises after financial liberalisation and especially so in the more financially dependent sectors.

Robustness checks

We conduct a series of robustness checks to assess the reliability of our results particularly with regard to the role of access to finance. In the first experiment we replace our 0-1 financial liberalisation dummy with a graduated 0-1-2 dummy. The results are reported in Tables 4 and 5.

***Insert Table 4 here**

***Insert Table 5 here**

The results are a confirmation of those reported in Tables 2 and 3. The size of the estimated coefficients as well as their significance levels are similar to those in Tables 2 and 3. Indeed,

the use of a perhaps more realistic graduated financial liberalisation dummy seems to have improved the significance levels of some of the control variables. The results in Tables 4 and 5 confirm the earlier findings that the greater availability of credit following financial liberalisation has resulted in an increase in industrial concentration and a decrease in net firm entry. Moreover, both of these effects are stronger in industrial sectors that are more dependent on external finance.

In the second experiment we replace our measure of external finance dependence, which was based on Malawian banking system data, with the index of financial dependence calculated by Rajan and Zingales. As discussed above, the two measures look at financial dependence from two different perspectives. The measure by Rajan and Zingales uses a 'theoretical' perspective, i.e. the degree of individual industrial sectors' financial dependence if credit from external sources is used exclusively to finance capital expenditure as dictated by the sector's technological needs and if the supply of credit is infinitely elastic. By contrast, the measure used in this paper represents the individual industrial sectors' 'actual' demand for external finance. In the Appendix we compare the rankings of industrial sectors according to their degree of external finance dependence produced by the two measures. We show that the rankings are statistically significantly different from one another. Nonetheless, for certain sectors, their ranks are similar in the two classifications. It is thus interesting to evaluate the sensitivity of the results reported in Tables 2 and 3 to the particular measure of financial dependence used in the regressions. The results obtained when using the Rajan and Zingales index are reported in Tables 6 and 7.

__Insert Table 6 here__

__Insert Table 7 here__

Interestingly, the results are similar to those reported in Tables 2 and 3. The significance levels of the control variables are almost unchanged. Moreover, the coefficients of the

interaction terms where the Rajan and Zingales index is used have size and significance levels analogous to those in Tables 2 and 3, confirming the findings that net firm entry falls and industrial concentration rises after financial liberalisation and that these effects are stronger in sectors that are more finance dependent.

In a third experiment we re-estimate the regressions for industrial concentration and net firm entry using higher frequency data, in this case annual data, without averaging. On the one hand, the averaging procedure is a standard approach to filter out business cycle effects; on the other hand, however, this procedure may be a source of bias in the presence of heterogeneity, for example due to the different impact of the business cycle on the different industries. Some sectors may lead the cycle, other sectors may lag it.

The increase in the number of observations implies that system GMM may not be the most suitable method of estimation, since typically its use is appropriate when the dataset has a short time dimension. In this paper, we employ two estimators to gauge the robustness of the results obtained through system-GMM estimation, namely, the Anderson-Hsiao IV-estimator (which can be seen as a special case of the Arellano-Bond difference estimator) and the fixed-effect estimator with industry-specific dummies.[19] Judson and Owen (1999) find that the Anderson-Hsiao estimator outperforms all others when T is larger than 20 while the fixed-effect estimator is superior when T is larger than 30.

The estimation results are reported in Tables 8 (for the industrial concentration regression) and 9 (for the net firm entry regression). Despite different data frequency and methods of estimation, Tables 8 and 9 show that the significance levels of the estimated coefficients are analogous to those of the coefficients reported in Tables 2 and 3. Of particular interest is the confirmation that financial liberalisation is associated with an increase in concentration, that such increase affects especially the sectors that are more dependent on

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[19] Although this estimator is biased when the lagged dependent variable is included among the regressors, the size of the bias has been shown to drop sharply as T exceeds 20 or 30 (Judson and Owen, 1999).

external finance, and that financial liberalisation is also associated with a fall in net firm entry in the financially dependent sectors.

Insert Table 8 here

Insert Table 9 here

Explanation of results

Our empirical results should not come as a surprise. While the perspective and the empirical approach we have used in this paper are original, our results provide further support for the argument made in Nissanke and Aryeetey (1998) and Nissanke (2001) that merely changing policy from financial repression to financial liberalization has not fully addressed the fundamental problems facing financial systems in sub-Saharan African countries, including Malawi.

Financial liberalisation in Malawi has led to significant financial development, as seen for example in the emergence of a large number of institutions with a mandate to finance business activity. The country now has 11 registered commercial banks (compared to only two during the pre-liberalization period), a stock exchange, two discount houses, and over twenty non-bank financial institutions, in addition to insurance companies and foreign exchange bureaux. Most of the commercial banks have also created specialized windows for lending to small and medium enterprises.[20] Moreover, over the years, non-governmental organisations in partnerships with the public and private sectors have created over twenty institutions with a mandate to lend to micro, small and medium enterprises. Yet, despite this and the greater ability on the part of the banking sector to mobilise savings, access to finance

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[20] For instance, apart from serving large enterprises, National Bank established National Financial Services to cater for the credit needs of small-scale entrepreneurs; Commercial Bank of Malawi, (now STANBIC), does the same through Commercial Bank Financial Services; and INDE Bank extends credit to the small-scale sub-sector through its two establishments, namely, INDE Fund and INDE Finance.

remains a problem for both large and small firms. Multiple factors contribute to give rise to this outcome.

One is the scarcity of term lending by the commercial banks, which have been shown to focus on the provision of short-term credit rather than long-term loans that are necessary for industrial development (World Bank, 1991; Malawi NSO, 2000 and 2005). Even business lending to 'blue chip' firms is in the form of short-term overdraft facilities. An important explanation for this fact is the availability of high-interest government bonds, which remove the incentives for banks to lend to businesses. Furthermore, traditional term lending institutions, such as pension funds, are not yet fully developed.

Another reason for the persistence of constraints on firms' access to credit is that commercial banks tend to concentrate their lending on traditional and established customers (often public enterprises and businesses with good cash flow, which usually are large and modern), and avoid those that are new and without any record. Aryeetey, *et al.* (1997) report that "in Malawi the small enterprise sector (fewer than 30 workers) received only 15.0 percent of total loan volumes in 1992, while large enterprises received 63.0 percent of total loans disbursed." (pp.210-211). Typically banks find it easier and more profitable to deal with the already established and large-scale enterprise segment of the market, which they consider to involve minimal risk and where transaction costs are lower.

Micro and small enterprises remain credit constrained despite the establishment of specialised lending institutions due to their inability to meet collateral requirements and their informational opacity. Furthermore, most entrepreneurs within the micro and small-scale sub-sector (firms up to 50 employees and consisting of approximately 744,000 income earning activities) consider credit from the lending institutions to be too expensive.[21] As a result, lack

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[21] A Malawi Government (2004) survey reveals that only 15.0 percent out of 606,000 business owners were able to secure financial assistance between 2000 and 2003. Of these, only 35.0 percent received credit from the micro-finance institutions. A previous survey (Malawi Government, 2000) reports that about one-third of

of access to finance is still the main obstacle to starting up an enterprise in Malawi. Micro-finance institutions are unable to fill this funding gap, as their lending capacity is rather limited. Most of these institutions were in fact created with donor seed capital and had no mandate to collect savings. Moreover, they are generally affected by low repayment rates, which erode their capital base. Similarly, the lending capacity of the informal financial sector (moneylenders, savings collectors, traders, etc.) is grossly inadequate to meet entrepreneurs' demand for credit. Furthermore, informal lenders do not provide medium and long-term credit either, despite being necessary for enterprise growth (Chipeta and Mkandawire, 1996).

Lack of access to adequate finance also hinders the transformation from micro and smaller enterprises to larger establishments. These enterprises use in fact their retained profits to finance working capital required for their daily operations or to meet household needs, rather than ploughing them back into expansion of capacity. As a result, despite its impressive income potential, the micro and small enterprise sub-sector is stagnating and its ability to grow and provide competition in the manufacturing sector continues to be inhibited.[22] Over the period 1996-2000, 78.0 percent of firms ended up contracting in size (both in terms of capital and number of employees) and, since 1999, more enterprises have closed-down than entered (World Bank, 2004).

5. Conclusions

This paper investigated the effects of financial liberalisation on industrial concentration and firm net entry and found that liberalisation is associated with a significant increase in concentration and a significant drop in firm entry. These effects are even stronger

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enterprises did not even apply for any loan; of these, about 16.0 percent did not apply due to the rigorous screening requirements. Furthermore, the high rejection rates tend to discourage any would-be applicants.
[22] On average, this sub-sector generates an annual gross sales value of about 43.9 percent of Malawi's GDP (adjusted to 2000 prices) and total annual profits of 15.6 percent of GDP (World Bank, 2004, p. 8). This sub-sector also employs over 1.7 million people, which account for about 38.0 percent of the country's total economically active population of 4.5 million.

in the industrial sectors that are more external finance dependent. These results indicate that financial liberalisation, even if it results in greater supply of credit and a larger number of lending institutions, does not remove financing constraints on firms, especially the micro, small and medium enterprises. It is the large existing firms that benefit from a more liberal financial regime.

These results say nothing about the desirability of financial liberalisation policies but they do imply that liberalisation may fail to relax the credit access constraints on firms, especially the small and medium ones. Hence, financial liberalisation may not be the key for starting a country's industrialisation effort. The development of productive capacities is unlikely to take place without the leadership of the state in industrial, technological, infrastructural and trade policies (UNCTAD, 2006). While, strictly speaking, this paper has nothing to say about these, it suggests that finance, once the state has withdrawn from credit allocation decisions, may not be an engine for industrial development.

The results of this paper hold for Malawi. Further research is required to establish the extent to which they can be generalised to other countries. It is unlikely, however, that the pooling restrictions required for cross-country studies hold across countries with different characteristics. Cross-country regressions may not be an adequate approach for research in this area. We are aware that our country-based study has also involved pooling of different cross-sectional units. Even within a single country, industrial sectors have different characteristics and further research is required to assess the sensitivity of our results to industrial sector heterogeneity. The research agenda has only just begun.

Table 1: Before-after and control group results

a) Before-after – Equation (1) Pre-reform levels (γ coefficient) and changes in the reform period with respect to the pre-reform period (β coefficients)			
Variable	Pre-reform period	Reform period	
		Short run	Long run
Lending rate (%)	17.3	**4.3*****	7.1
	(2.526)	(1.167)	(10.310)
Private sector credit to total domestic credit (%)	20.6	0.7	**10.6*****
	(1.764)	(2.141)	(6.251)
Manufacturing sector credit to GDP (%)	4.1	**6.1*****	**15.3*****
	(0.215)	(2.056)	(5.562)
Liquid liabilities to GDP (%)	10.9	**11.3*****	**22.0*****
	(3.554)	(3.578)	(3.904)
Commercial bank assets to total bank assets (%)	45.1	**8.5****	**26.2*****
	(1.773)	(6.163)	(4.320)
Spread Treasury Bill and lending rate (%)	-7.1	**12.4****	**23.8*****
	(1.429)	(9.821)	(3.758)
Government bond holdings to deposits (%)	6.1	**18.1****	**43.6*****
	(0.829)	(12.072)	(4.241)
Government bold holdings to loans (%)	17.3	**18.1****	**52.8*****
	(0.581)	(12.844)	(9.405)
GDP growth (%)	2.9	0.5	1.0
	(2.254)	(6.939)	(9.393)
Investment to GDP (%)	16.5	4.1	0.3
	(3.825)	(3.595)	(7.241)
Manufacturing value added to GDP (%)	19.3	-3.3	-3.4
	(8.743)	(16.781)	(7.669)
Industrial concentration	63.1	**24.6*****	**34.4*****
	(12.3)	(4.1)	(3.3)
Net firm entry	4.7	**-4.7*****	**-20.6***
	(8.0)	(0.0)	(15.1)
b) Control group – Equation (2) Changes in the reform period with respect to the pre-reform period using the low finance dependent group as the control group (β, β^H and β^M coefficients)			
Variable	Degree of financial dependence	Reform period	
		Short run	Long run
Industrial concentration	Low	**-0.080***	-0.050
		(0.049)	(0.048)
	Medium	**0.130****	**0.255****
		(0.062)	(0.060)
	High	0.100	**0.218*****
		(0.072)	(0.070)
Net firm entry	Low	**0.367*****	**0.338*****
		(0.124)	(0.124)
	Medium	**-0.368****	**-0.344****
		(0.157)	(0.157)
	High	-0.172	**-0.353****
		(0.184)	(0.183)

Table 2: Regression results: Industrial concentration

	Economy-wide effects		Sector-specific effects	
	Not accounting for Financial Liberalization	Accounting for Financial Liberalization	*Not* accounting for Financial Liberalization	Accounting for Financial Liberalization
	(1)	(2)	(3)	(4)
Lagged concentration	**0.548***** *(0.161)*	**0.548***** *(0.161)*	**0.573***** *(0.096)*	**0.379*** *(0.200)*
Industry size	**-0.059*** *(0.031)*	**-0.059*** *(0.031)*	**-0.059**** *(0.028)*	-0.051 *(0.039)*
Industry growth	**-0.235*** *(0.136)*	**-0.235*** *(0.136)*	**-0.174**** *(0.079)*	**-0.127**** *(0.058)*
Export intensity	**0.159***** *(0.048)*	**0.078*** *(0.042)*	**0.178***** *(0.036)*	**0.201***** *(0.052)*
Import intensity	**-0.025***** *(0.004)*	**-0.013**** *(0.004)*	**-0.017**** *(0.006)*	0.009 *(0.007)*
FIN	**0.339***** *(0.082)*	0.026 *(0.087)*	0.076 *(0.131)*	-0.054 *(0.158)*
FIN*FL		**0.225**** *(0.089)*		
FIN*ED			**0.012**** *(0.004)*	**0.011**** *(0.005)*
FIN*ED*FL				**0.120***** *(0.018)*

F Test	52.51 *(0.000)*	52.51 *(0.000)*	313.88 *(0.000)*	130.29 *(0.000)*
Hansen *J*-Test	9.45 *(0.397)*	9.45 *(0.397)*	6.39 *(0.700)*	9.70 *(0.375)*
Test for *AR* (1) errors	-2.52 *(0.012)*	-2.52 *(0.012)*	-2.73 *(0.006)*	-1.83 *(0.068)*
Test for *AR* (2) errors	-1.09 *(0.275)*	-1.09 *(0.275)*	-1.26 *(0.206)*	-0.74 *(0.458)*
No. of Industries	20	20	20	20
No. of Observations	120	120	120	120

Note: Significant at the 1% ***, 5%**, and 10%*. Robust Standard Errors are in parentheses under the respective estimated coefficients. In the lower part of the table, the numbers in parentheses under the values of the test statistics are probability values. FIN is credit to the manufacturing sector as a ratio of GDP. FL is the financial liberalisation dummy. ED is the measure of external finance dependence.

Table 3: Regression results: Net firm entry

	Economy-wide effects		Sector-specific effects	
	Not accounting for Financial Liberalization	Accounting for Financial Liberalization	*Not* accounting for Financial Liberalization	Accounting for Financial Liberalization
	(1)	(2)	(3)	(4)
Lagged net firm entry	**0.507*** (0.166)	**0.507** (0.166)	**0.541*** (0.122)	**0.431** (0.182)
Profitability	**-0.139** (0.059)	**-0.139** (0.059)	**-0.142** (0.068)	-0.109 (0.097)
State of the economy	**-0.006*** (0.002)	**-0.003* (0.001)	**-0.007*** (0.001)	**-0.009*** (0.002)
Industry growth	**0.192* (0.105)	**0.192* (0.105)	**0.147* (0.078)	**0.090* (0.044)
Import intensity	**0.023*** (0.004)	**0.013*** (0.003)	**0.015** (0.006)	-0.005 (0.007)
FIN	**-0.286*** (0.066)	-0.013 (0.063)	-0.057 (0.124)	0.003 (0.128)
FIN*FL		**-0.196** (0.067)		
FIN*ED			**-0.010** (0.004)	**-0.009** (0.004)
FIN*ED*FL				**-0.103*** (0.014)

F Test	73.12 (0.000)	73.12 (0.000)	278.05 (0.000)	201.06 (0.000)
Hansen *J*-Test	7.04 (0.633)	7.04 (0.633)	6.96 (0.641)	8.52 (0.483)
Test for *AR* (1) errors	-2.52 (0.012)	-2.52 (0.012)	-2.70 (0.007)	-2.02 (0.044)
Test for *AR* (2) errors	-1.30 (0.194)	-1.30 (0.194)	-1.22 (0.221)	-0.93 (0.350)
No. of Industries	20	20	20	20
No. of Observations	120	120	120	120

<u>*Note*</u>: Significant at the 1% ***, 5%**, and 10%*. Robust Standard Errors are in parentheses under the respective estimated coefficients. In the lower part of the table, the numbers in parentheses under the values of the test statistics are probability values. FIN is credit to the manufacturing sector as a ratio of GDP. FL is the financial liberalisation dummy. ED is the measure of external finance dependence.

Table 4: Regression results with a graduated financial liberalisation dummy:
Industrial concentration

	Economy-wide effects	Sector-specific effects
	(1)	(2)
Lagged concentration	**0.548*** *(0.161)*	**0.573*** *(0.096)*
Industry size	**-0.059*** *(0.031)*	**-0.059**** *(0.028)*
Industry growth	**-0.235*** *(0.136)*	**-0.174**** *(0.079)*
Export intensity	**0.078*** *(0.042)*	**0.602*** *(0.146)*
Import intensity	**-0.013*** *(0.004)*	**0.028**** *(0.011)*
FIN	-0.069 *(0.118)*	**0.776**** *(0.334)*
FIN*FL	**0.095**** *(0.038)*	
FIN*ED		**0.012*** *(0.004)*
FIN*ED*FL		**0.014*** *(0.004)*

F Test	52.51 *(0.000)*	313.88 *(0.000)*
Hansen *J*-Test	9.45 *(0.397)*	6.39 *(0.700)*
Test for *AR* (1) errors	-2.52 *(0.012)*	-2.73 *(0.006)*
Test for *AR* (2) errors	-1.09 *(0.275)*	-1.26 *(0.206)*
No. of Industries	20	20
No. of Observations	120	120

<u>Note</u>: Significant at the 1% ***, 5%**, and 10%*. Robust Standard Errors are in parentheses under the respective estimated coefficients. In the lower part of the table, the numbers in parentheses under the values of the test statistics are probability values. FIN is credit to the manufacturing sector as a ratio of GDP. FL is the financial liberalisation dummy. ED is the measure of external finance dependence.

Table 5: Regression results with a graduated financial liberalisation dummy:
Net firm entry

	Economy-wide effects	Sector-specific effects
	(1)	(2)
Lagged net firm entry	**0.507*** *(0.166)*	**0.541*** *(0.122)*
Profitability	**-0.139** *(0.059)*	**-0.142** *(0.068)*
State of the economy	**-0.002* *(0.001)*	**-0.024*** *(0.007)*
Industry growth	**0.192* *(0.105)*	**0.147* *(0.078)*
Import intensity	**0.013*** *(0.003)*	**-0.021** *(0.010)*
FIN	0.070 *(0.085)*	**-0.622* *(0.323)*
FIN*FL	**-0.083*** *(0.028)*	
FIN*ED		**-0.010** *(0.004)*
FIN*ED*FL		**-0.011** *(0.004)*

F Test	73.12 *(0.000)*	278.05 *(0.000)*
Hansen *J*-Test	7.04 *(0.633)*	6.96 *(0.641)*
Test for *AR* (1) errors	-2.52 *(0.012)*	-2.70 *(0.007)*
Test for *AR* (2) errors	-1.30 *(0.194)*	-1.22 *(0.221)*
No. of Industries	20	20
No. of Observations	120	120

Note: Significant at the 1% [***], 5%[**], and 10%[*]. Robust Standard Errors are in parentheses under the respective estimated coefficients. In the lower part of the table, the numbers in parentheses under the values of the test statistics are probability values. FIN is credit to the manufacturing sector as a ratio of GDP. FL is the financial liberalisation dummy. ED is the measure of external finance dependence.

Table 6: Regression results with the Rajan and Zingales index: Industrial concentration

	Sector-specific effects	
	Not accounting for Financial Liberalization	Accounting for Financial Liberalization
	(1)	(2)
Lagged concentration	**0.548***** *(0.161)*	**0.573***** *(0.113)*
Industry size	**-0.059*** *(0.031)*	**-0.062**** *(0.025)*
Industry growth	**-0.235*** *(0.136)*	**-0.170**** *(0.083)*
Export intensity	**0.137***** *(0.044)*	**0.083**** *(0.037)*
Import intensity	**-0.081**** *(0.025)*	**0.015*** *(0.058)*
FIN	0.049 *(0.080)*	-0.008 *(0.056)*
FIN*ED	**0.011**** *(0.004)*	-0.003 *(0.009)*
FIN*ED*FL		**0.018**** *(0.008)*

F Test	52.51 *(0.000)*	99.75 *(0.000)*
Hansen *J*-Test	9.45 *(0.397)*	7.19 *(0.617)*
Test for *AR* (1) errors	-2.52 *(0.012)*	-2.64 *(0.008)*
Test for *AR* (2) errors	-1.09 *(0.275)*	-1.49 *(0.137)*
No. of Industries	20	20
No. of Observations	120	120

<u>*Note*</u>: Significant at the 1% [***], 5%[**], and 10%[*]. Robust Standard Errors are in parentheses under the respective estimated coefficients. In the lower part of the table, the numbers in parentheses under the values of the test statistics are probability values. FIN is credit to the manufacturing sector as a ratio of GDP. FL is the financial liberalisation dummy. ED is the measure of external finance dependence.

Table 7: Regression results with the Rajan and Zingales index: Net firm entry

	Sector-specific effects	
	Not accounting for Financial Liberalization	Accounting for Financial Liberalization
	(1)	(2)
Lagged net firm entry	**0.507*** *** *(0.166)*	**0.547*** *** *(0.140)*
Profitability	**-0.139** *(0.059)*	**-0.154** *(0.064)*
State of the economy	**-0.005*** *(0.002)*	**-0.004** *(0.002)*
Industry growth	**0.192*** *(0.105)*	0.147 *(0.089)*
Import intensity	**0.071*** *(0.019)*	-0.009 *(0.060)*
FIN	-0.033 *(0.058)*	-0.002 *(0.056)*
FIN*ED	**-0.010*** *(0.003)*	0.003 *(0.009)*
FIN*ED*FL		**-0.014*** *(0.008)*

F Test	73.12 *(0.000)*	123.91 *(0.000)*
Hansen *J*-Test	7.04 *(0.633)*	8.00 *(0.534)*
Test for *AR* (1) errors	-2.52 *(0.012)*	-2.65 *(0.008)*
Test for *AR* (2) errors	-1.30 *(0.194)*	-1.45 *(0.147)*
No. of Industries	20	20
No. of Observations	120	120

<u>*Note*</u>: Significant at the 1% ***, 5%**, and 10%*. Robust Standard Errors are in parentheses under the respective estimated coefficients. In the lower part of the table, the numbers in parentheses under the values of the test statistics are probability values. FIN is credit to the manufacturing sector as a ratio of GDP. FL is the financial liberalisation dummy. ED is the measure of external finance dependence.

Table 8: Regression results with yearly data (1970-2004): Industrial concentration.

	Economy-wide effects				Sector-specific effects			
	Not accounting for Financial Liberalization		Accounting for Financial Liberalization		*Not* accounting for Financial Liberalization		Accounting for Financial Liberalization	
	Fixed Effects	Anderson-Hsiao	Fixed Effects	Anderson-Hsiao	Fixed Effects	Anderson-Hsiao	Fixed Effects	Anderson-Hsiao
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged concentration	**0.632*** ***	**0.671*** ***	**0.617*** ***	**0.657*** ***	**0.581*** ***	**0.618*** ***	**0.573*** ***	**0.608*** ***
	(0.031)	*(0.042)*	*(0.031)*	*(0.040)*	*(0.031)*	*(0.040)*	*(0.031)*	*(0.040)*
Industry size	**0.267****	**0.265***	**0.245****	**0.241***	**0.242****	**0.233***	**0.269*** ***	**0.268****
	(0.105)	*(0.146)*	*(0.104)*	*(0.146)*	*(0.101)*	*(0.141)*	*(0.102)*	*(0.136)*
Industry growth	**-0.040*** ***	**-0.037*** ***	**-0.045*** ***	**-0.042*** ***	**-0.033*** ***	**-0.030*** ***	**-0.037*** ***	**-0.035*** ***
	(0.007)	*(0.008)*	*(0.007)*	*(0.008)*	*(0.007)*	*(0.008)*	*(0.007)*	*(0.008)*
Export intensity	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(0.002)	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*
Import intensity	**-0.004****	-0.004	**-0.005****	**-0.005****	**-0.004****	**-0.005****	-0.008	**-0.008****
	(0.002)	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.003)*	*(0.003)*
FIN	**0.003*** ***	**0.003***	**0.003****	0.002	-0.001	-0.001	-0.001	-0.001
	(0.001)	*(0.002)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*	*(0.001)*
FIN*FL			**0.005*** ***	**0.005****				
			(0.002)	*(0.002)*				
FIN*ED					**0.006*** ***	**0.006*** ***	**0.005*** ***	**0.005*** ***
					(0.001)	*(0.001)*	*(0.001)*	*(0.001)*
FIN*ED*FL							**0.022****	**0.022*** ***
							(0.011)	*(0.013)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
F Test	173.05	-	158.64	-	171.04	-	156.67	-
	(0.000)		*(0.000)*		*(0.000)*		*(0.000)*	
R-*squared*	0.71	-	0.71	-	0.72	-	0.73	-
No. of Industries	20	20	20	20	20	20	20	20
No. of Observations	680	680	680	680	680	680	680	680

__Note__: Significant at the 1% [***], 5%[**], and 10%[*]. Robust Standard Errors are in parentheses under the respective estimated coefficients. In the lower part of the table, the numbers in parentheses under the values of the *F*-statistics are probability values. FIN is credit to the manufacturing sector as a ratio of GDP. FL is the financial liberalisation dummy. ED is the measure of external finance dependence.

Table 9: Regression results obtained with yearly data (1970-2004): Net firm entry

	Economy-wide effects				Sector-specific effects			
	Not accounting for Financial Liberalization		Accounting for Financial Liberalization		*Not* accounting for Financial Liberalization		Accounting for Financial Liberalization	
	Fixed Effects	Anderson-Hsiao	Fixed Effects	Anderson-Hsiao	Fixed Effects	Anderson-Hsiao	Fixed Effects	Anderson-Hsiao
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged net firm entry	**0.428*** *** *(0.034)*	**0.453*** *** *(0.037)*	**0.431*** *** *(0.035)*	**0.455*** *** *(0.038)*	**0.424*** *** *(0.034)*	**0.448*** *** *(0.037)*	**0.419*** *** *(0.034)*	**0.443*** *** *(0.038)*
Profitability	**-0.132** *(0.043)*	**-0.132** *(0.052)*	**-0.134** *(0.043)*	**-0.134** *(0.052)*	**-0.120** *(0.043)*	**-0.118** *(0.054)*	**-0.119** *(0.043)*	**-0.118** *(0.054)*
State of the economy	-0.005 *(0.007)*	-0.004 *(0.008)*	-0.005 *(0.007)*	-0.004 *(0.008)*	-0.007 *(0.007)*	-0.007 *(0.009)*	-0.007 *(0.007)*	-0.007 *(0.009)*
Industry growth	**0.140*** *** *(0.016)*	**0.136*** *** *(0.019)*	**0.141*** *** *(0.016)*	**0.138*** *** *(0.020)*	**0.148*** *** *(0.016)*	**0.156*** *** *(0.021)*	**0.159*** *** *(0.017)*	**0.156*** *** *(0.021)*
Import intensity	**0.011** *(0.005)*	**0.011*** *(0.006)*	**0.011** *(0.005)*	**0.012*** *(0.006)*	**0.011** *(0.005)*	**0.022** *(0.009)*	**0.022*** *** *(0.007)*	**0.022** *(0.009)*
FIN	-0.001 *(0.003)*	-0.001 *(0.004)*	-0.001 *(0.003)*	-0.001 *(0.004)*	-0.004 *(0.004)*	-0.005 *(0.004)*	-0.005 *(0.004)*	-0.005 *(0.004)*
FIN*FL			-0.003 *(0.004)*	-0.003 *(0.005)*				
FIN*ED					**0.005** *(0.002)*	**0.007** *(0.003)*	**0.008*** *** *(0.003)*	**0.007** *(0.004)*
FIN*ED*FL							**-0.079*** *** *(0.027)*	**-0.078** *(0.037)*

F Test	41.71 *(0.000)*	-	37.53 *(0.000)*	-	36.50 *(0.000)*	-	35.82 *(0.000)*	-
R-*squared*	0.37	-	0.37	-	0.37	-	0.38	-
No. of Industries	20	20	20	20	20	20	20	20
No. of Observations	680	680	680	680	680	680	680	680

Note: Significant at the 1% [***], 5% [**], and 10% [*]. Robust Standard Errors are in parentheses under the respective estimated coefficients. In the lower part of the table, the numbers in parentheses under the values of the *F*-statistics are probability values. FIN is credit to the manufacturing sector as a ratio of GDP. FL is the financial liberalisation dummy. ED is the measure of external finance dependence.

Appendix

The rankings of industrial sectors according to their degree of external finance dependence

The table below presents the rankings obtained by using the index of finance dependence formulated by Rajan and Zingales (1998) and the index that we calculated on the basis of Malawian industry-level (three digit ISIC) data. We evaluated the similarity between the two rankings by means of the Spearman Rank-Order Correlation Coefficient. This has a value of 0.0436, on the basis of which we cannot reject the null hypothesis that there is no association between the two rankings.

Alternative measures and rankings of manufacturing industries' external finance dependence

Manufacturing Sub-Sector	Rajan and Zingales		Kabango and Paloni	
	Dependence Ratio	Rank	Dependence Ratio	Rank
Tobacco manufacturing	-0.45	1	1.53	20
Leather	-0.14	2	0.15	4
Footwear	-0.08	3	0.37	9
Clothing and Apparel	0.03	4	0.43	10
Non-Metal Products	0.06	5	0.22	5
Beverages	0.08	6	1.18	16
Food	0.14	7	0.10	1
Paper Products	0.17	8	1.32	18
Textiles	0.19	9	0.59	13
Printing and Publishing	0.20	10	1.01	15
Rubber	0.23	11	0.13	3
Furniture	0.24	12	0.34	8
Fabricated Metal	0.24	12	0.26	6
Industrial Chemicals	0.25	14	1.26	17
Wood and Sawmill	0.28	15	0.11	2
Transport Equipment	0.36	16	1.42	19
Machinery – General	0.60	17	0.31	7
Other Chemicals	0.75	18	0.93	14
Machinery – Electrical	0.95	19	0.53	11
Plastic Products	1.14	20	0.55	12

To classify the industrial sectors as low, medium and high external finance dependent we proceed as follows: sectors with the lowest 25 percent of the finance dependence ratios constitute the low finance dependent group (5 sectors); the highest 25 percent are the high finance dependent group (5 sectors); the remaining 50 per cent (10 sectors) are the middle group.

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