Barriers to growth of firms in developing countries
Evidence from Burundi

Micheline Goedhuys
Catholic University of Leuven

Leo Sleuwaegen
Catholic University of Leuven and Erasmus University Rotterdam

Version April 1998

Keywords: firm growth, organisational ecology, learning
JEL Codes: D92, L11, O17, O55

Corresponding Author
Leo Sleuwaegen
Catholic University of Leuven
Faculty of Economic and Applied Economic Science
Naamsestraat 69, B-3000 Leuven, Belgium
Telephone: (32) 16.32.69.13
Facsimile: (32) 16.32.67.32
Email: Leo.Sleuwaegen@econ.kuleuven.ac.be

We would like to thank the participants of the conference 'The Impact of Technological Change on Industry and Firm Performance' held in August, 1997 in Rotterdam for comments on a related study and in particular we are grateful to David Audretsch, Martin Carree and Steven Klepper. Financial support from the Belgian Fund for Scientific Research (FWO-G.0196.96 N) is gratefully acknowledged.

1. Introduction

After independence, most African countries expected economic development to come from a solid industrial base generated by large-scale investments undertaken by the state and foreign investors and supported by heavy protection from foreign competition. However, when the large state and foreign owned enterprises generated disappointing results, the focus of attention shifted towards smaller enterprises. During the last decade, most African governments undertook further policy reforms in order to liberalise their economy and 'restore market forces'. Within this new approach, competition among firms through an open market mechanism was considered a better instrument for allocating resources to more efficient organisations within a thriving private sector.

However, so far the results remain disappointing in most countries. Besides what is left of former large scale investments, a large number of micro-enterprises and small firms struggle for survival and face important barriers preventing them from growing into a larger size. In many developing countries product markets and markets for inputs are still ill developed and characterised by a low number of market participants and high transaction costs. Market failures weaken the process of competition among firms as an effective selection mechanism.

Accounting for the conditions of the institutional environment contributes to a better understanding of the process by which resources are allocated, and firms able to grow, in developing countries. In a related study on the growth of manufacturing firms in Côte d'Ivoire (Sleuwaegen, Goedhuys, 1998), firm growth is found to result from a complex process in which institutional and structural factors interact. Similar conditions seem to apply to Burundi, the country under study in this paper.

In the early years after its independence, the Burundian state had taken up and consolidated an overly dominating role in the ownership and management of productive assets, especially as its influence was even more strengthened by a tight regulation of the economy. Following a period of severe crisis and macro-economic imbalances, the government embarked in 1986 on its first comprehensive adjustment programme. By the end of 1993, Burundi was considered one of Sub-Saharan Africa's most liberal trade regimes (World Bank, IDA, 1992). Still, the manufacturing sector in Burundi remains relatively small. In most sectors a very small number of formal firms occupy a dominant position in the local market. The informal sector is very strongly represented, especially in the rural areas. Burundi's past and current structural problems as well as the characteristics of its manufacturing sector are typical of the much larger region of Sub-Saharan Africa and make it a good representative country for studying the dynamics of firm growth in this region of the world.

The second section of this paper presents an analytical framework which integrates institutional factors into the more traditional literature on firm growth. After presenting the data in section three, the empirical model is proposed in section four and tested against data on a heterogeneous group of manufacturing firms in Burundi. In section five, an analysis of labour productivity differences among firms, as well as an analysis of the perceptions of growth barriers by the owners and managers of the sample firms, provide corroborating evidence on the determinants of firm growth. Section six concludes.

2. Growth of firms in developing countries

Research on the size distributions of firms and the underlying firm dynamics commonly starts from Gibrat's law of proportionate effect (LPE) which implies that firms grow each year following a random drawing from a distribution of growth rates. This stochastic growth model, as well as the whole generation of growth models based on weaker assumptions of the LPE, generate skewed distributions (log-normal, Pareto, Yule) which fit the observed size distributions of firms in Western economies strikingly well (Ijiri, Simon, 1964).

In spite of the apparent power of Gibrat's law, an increasing number of empirical studies find evidence which goes against it. Most studies find a significant negative relationship between firm growth and firm size (Mansfield (1962), Evans (1987a), Kumar (1985) and Dunne and Hughes (1994)). In industries characterised by the existence of economies of scale, small efficient firms grow faster than their larger counterparts as they overcome their initial scale disadvantage and investing relatively more than larger firms. Audretsch (1995) finds evidence suggesting that a larger gap between the minimum efficient scale and firm size is related to higher growth rates of surviving firms. Moreover, a negative relationship is often observed between the variability in growth rates and firm size [Mansfield (1962), Kumar (1985), Dunne and Hughes (1994), Dunne, Roberts and Samuelson (1989)]. Similarly, Gibrat's law is violated by a negative relationship between firm growth and firm age [Evans (1987a) and Dunne and Hughes (1994)] and between the variability in growth and firm age.

Using an alternative theoretical approach, Lucas (1978) argued that the equilibrium size distribution of firms is determined by the underlying distribution of managerial abilities within the population. Deepening this line of reasoning, Jovanovic (1982) claimed that, once firms are established in the industry, they learn about their efficiency. The process of competition forces the least efficient firms to exit. The more efficient firms expand their activities when their managers observe that their guesses about their managerial efficiency turn out to have understated their true efficiency. As a firm ages, the manager's guess about his efficiency becomes more accurate and the probability decreases that the output

will widely differ from one year to another. Older firms, therefore, grow more slowly than young firms and their growth rates are relatively stable. Pakes and Ericson (1990) extended the passive learning model of Jovanovic. In their view, managers not only uncover their efficiency through learning, they are also able to increase their efficiency over time through human capital formation.

Focusing more on the particular characteristics of markets in developing countries and pointing to the failure of existing theories to explain the frequently observed dual market structure in developing countries, institutional economists have increasingly drawn attention to the role of institutional influences on firm growth. The underdevelopment of both input and product markets, the too low number of market participants and the resultingly high transaction costs tend to shift growth opportunities among firms. The argument is mainly developed around the effect of the relative underdevelopment of markets for credit and equity on the size of firms (Nabli, Nugent, 1989; Nabli, Nugent, 1992, see also Nugent (1996) for an empirical testing with respect to Korea).

Along the same line of reasoning, organisational ecology models view firm growth primarily as determined by a process of diffuse competition, in which firms essentially compete for scarce resources. Firms competing for an identical set of resources are residing in the same 'niche'. The growth of one firm or selected group of firms, therefore, impedes or severely depresses the growth rates of other firms in the niche which are deprived of inputs. Moreover, a firm's access to resources is facilitated to the extent that the firm is 'legitimated' in the industry, i.e. socially accepted and benefiting from an institutional standing in the eyes of other contracting parties such as clients, suppliers, financial institutions, law enforcing agents and other key actors (Hannan, Ranger-Moore, Banaszak-Holl, 1990; Hannan, Carroll, 1992, Winter, 1990).

In a related study, Sleuwaegen and Goedhuys (1998) presented an approach which integrates the implications of organisational ecology models into the market selection processes suggested by the models of learning. Using data on a heterogenous group of manufacturing firms in Côte d'Ivoire, they find that firm growth is explained by size and age effects as a result of efficiency seeking through scale enlargements and learning, but it is strongly moderated by processes of diffuse competition and by formal legitimation in the industry.

This paper develops a similar model using a unique data set of manufacturing firms in Burundi. The paper seeks to provide further evidence on firm growth in developing countries and to explain the particular barriers which exist for some groups of firms.

3. Data

The empirical analysis is based on a data set covering the growth of a representative sample of 120 manufacturing firms located in Burundi. The data are obtained from a survey conducted within the framework of the World Bank project RPED ('Regional Program on Enterprise Development in Africa') in April-May 1993. The firms are selected from one of the four main industrial sectors: agro-industries, textiles, wood-working and metal-working as shown in table 1.

Both formal and informal sector firms are included. In line with other studies (McPherson and Liedholm, 1996; Mead and Morrisson, 1996), firms are defined as 'formal' if they are registered, fulfil all tax obligations and respect labour and other regulations. Following this definition, the formal firms were selected from the population of firms which contribute to the INSS (Institut National de Sécurité Social) or are registered with the ISTEEBU (Burundi Institute of Statistics and Economic Studies), the Ministery of Commerce and Industry, or the Burundi Chamber of Commerce, Industry, Agriculture and Handicraft[1].
Of the group of informal firms on the other hand no traces can be found in the national statistics[2]. The informal firms included in the sample were selected randomly.

As most industrial activity is located in the capital of Bujumbura, the majority of the sample firms is also located there. The more important firms located in other regions of the country, including Gitega, Muramvya, Ngozi and Rumonge, are also included in the survey. A limited number of smaller and informal sector firms was surveyed on each field trip outside Bujumbura.

Despite the government's commitment to privatise state owned enterprises, the process has been very slowly implemented. The dominance of state ownership is still an important feature of the manufacturing sector which explains why a number of firms in the sample is partially or entirely state owned. Foreign investment and ownership had declined in the early 1980s. Some of the structural adjustment measures are designed to promote foreign investment particularly in export oriented ventures. In 1993 foreign investors came mainly from Europe and the Indian subcontinent.

INSERT TABLE 1 ABOUT HERE

[1] These firms respect fiscal obligations including company taxes, transaction taxes on goods and services, property taxes on land and vehicles collected by the local government, tax on increases in capital and taxes levied on dividends. On the other hand, they have full access to all business support services organised by state agencies and can benefit from tax exemptions provided by the investment code.
[2] Informal firms are at most registered in their urban district. They pay municipal taxes but no income taxes and they do not adhere to official labour regulations which prior to the adjustment programmes used to be considered extremely restrictive, both to the hiring and firing of workers. None of the informal firms have access to business support services and training programs.

4. Empirical model

Similar to earlier work on firm growth (Evans, 1987a, Mc Pherson, 1996), the proposed model follows a general growth function g in size and age:

$$g = \frac{S_{t'}}{S_t} = g(S_t, A_{t'}) \qquad (1)$$

where $S_{t'}$ and S_t are the size of a firm in period t' and in period t respectively and $A_{t'}$ is the age of the firm in period t'. Following the arguments proposed by organisational ecology models, this functional relationship is assumed to be moderated through a set of environmental and firm specific variables X which are hypothesized to interact with the basic function in the following way:

$$G = g(S_t, A_{t'})e^{bX} \qquad (2)$$

Approximating the growth function g through a second order logarithmic expansion of a generalised function relating growth to size and age, the estimating equation corresponds to the following form:

$$\frac{\log(S_{t'}) - \log(S_t)}{d} = a_0 + a_1 \log(S_t) + a_2\left[\log(S_t)\right]^2 + a_3 \log(A_{t'}) + a_4\left[\log(A_{t'})\right]^2 + a_5 \log(S_t) * \log(A_{t'}) + \sum_{i=1}^{n} b_i X_i \qquad (3)$$

where d stands for the number of years over which growth is measured and a and b are coefficient vectors.

The dependent variable in equation 3 corresponds to an average annual growth rate. The relationship between firm growth and size and between firm growth and age can subsequently be analysed by calculating the respective partial derivatives (Evans, 1987a and 1987b; Variyam and Kraybill, 1992). The partial derivatives g_s=(dlnG/dlnS) and g_a=(dlnG/dlnA) allow us to test for alternative theories of firm growth. Gibrat's law implies that the partial derivative g_s equals zero. Alternatively a negative relationship between firm size and growth implies that $g_s<0$. Models of learning suggest that $g_a<0$. The elasticity of end-of-period size with respect to beginning-of-period size is $E_S=1+dg_s$, while the elasticity of end-of-period size with respect to age is $E_A=d\ g_a$.

Variables

The dependent variable is the average annual growth rate of employment calculated over the period 1986-93, covering the years the structural adjustment programme came into effect. The analysis is also performed analysing growth over the entire period of existence of the firm, from birth to 1993[3].

[3] As some respondents could not remember the number of employees in 1986 or at start-up, especially for older firms historical employment data were not consistently available for all firms and the number of observations is reduced in the growth equation. In order to use the maximum information available from the

Following the proposed estimating equation, the set of explanatory variables includes firm size (SIZE), and firm age (AGE) as basic determinants of firm growth. Size is measured at the beginning of the period under consideration, start-up and 1986 respectively, while age is measured in 1993.

The environmental moderators of the growth relationship include the sector to which the firm belongs and the region where it is located. Three binary variables account for possibly different growth performances in textiles, wood-working and metal-working industries (WOOD, TEXTILES, METAL), the reference sector being agro-industries.

From interviews it is clear that owners and managers view access to local resources as an important determinant for the choice of the geographical location[4]. This is especially true for firms located in the more remote areas of Rumonge, Muramvya Ngozi and Gitega. However, Burundi's mountainous terrain, and its landlocked position additionally constrain these firms' access to local product markets. Clearly, the largest market is found in the capital city[5], Bujumbura, where firms are also more likely to engage in networking and sub-contracting. A binary variable (OUTBUJA) is included to capture the geographical niche effect of being located outside Bujumbura.

Sourcing from abroad is taken into account by the variables EUROPEAN and ASIAN which equal one if the majority of the equity capital is of European, respectively Asian, origin. In a similar way, a binary variable SOE denotes state owned enterprises which have a soft budget constraint and have access to bank loans under state guarantee. Their status, moreover, facilitates the relationship with other market participants.

In order to take further account of the firm's legitimation in the industry, a binary variable FORMAL is included. The variable takes the value one for formally registered firms which are able to advertise themselves in the industry, and zero for the informal firms, which refrain from officially registering primarily for tax purposes and to alleviate regulatory burdens.

Results

---

data set the size of the sample may therefore differ across estimating models. Running the model on different subsamples did not produce any different results.

[4] 67% of the firms located outside Bujumbura mention availability of industrial land and access to raw materials as the main location determinant.

[5] Being close to clients and competitors is a relatively more important location determinant for firms in Bujumbura (57% of the firms) than for firms located in the more remote areas (11% of the firm). In Bujumbura, there is also better provision of infrastructure and a larger supply of skilled labour. The availability of industrial sites and infrastructure and access to raw materials and skilled labor were mentioned as the main location determinant by one third of the firms located there.

A two stage estimation procedure, instrumenting the variable FORMAL, is adopted to account for the possible bias originating from endogeneity of the latter variable. It should also be noted that only surviving firms are included in the data set. However, a recent study by McPherson (1996) on the growth of firms in five southern African countries analyses the possible selection bias resulting from the exclusion of exiting firms on the growth relationship and finds this bias to be insignificant.

Table 2 shows the estimated coefficients and t-ratios for the growth regressions over the two different periods from 1986 until 1993 and from start-up until 1993. The average annual growth rate equals 0.10 and 0.11 over the period 1986-93 and start-1993 respectively.

INSERT TABLE 2 HERE

The relationship between age and growth is negative as suggested by the models of learning. This result holds for the different periods over which growth is measured. Evaluated at the sample means, the partial derivative of growth to log age equals -0.18 for the period 1986-93 and -0.17 for the entire period from start-up until 1993. The elasticity of size with respect to age equals -0.93 and -1.39 for the respective periods.

The relationship between size and growth is negative, implying that smaller firms grow faster than larger ones. This is consistent with studies conducted in other countries. The partial derivatives of the growth rate to log size evaluated at the sample mean are negative. The derivative equals -0.13 for the period 1986-93 and -0.12 for start-up until 1993. The elasticity of end-of-period size with respect to beginning-of-period size is 0.35 and 0.04 for both models. These results go against Gibrat's law of random growth behaviour.

The hypothesis that growth is moderated through different environmental and institutional conditions is also supported by the data. The coefficient of the variable FORMAL is positive and significant at the 99% level. The formal character of a firm increases its estimated annual growth rate over the period 1986-93 by 0.44. For the period start-93 the formal status increases the expected annual growth rate by 0.31. The results suggest that, besides competition, the process of formal legitimation is important. Formal firms tend to grow faster as scarce resources are allocated to established firms which have legitimated themselves in markets characterised by high transaction costs.

The geographical location also appears to have an impact on the development of firms. Being located outside Bujumbura has a negative impact on growth indicating that the better supplied Bujumbura region is more conducive to firm development than the less accessible and more remote regions. External scale economies and urbanisation economies relaxing diffuse competition for resources seem to account for these differences in growth

performances. Being located in Bujumbura increases, on average, the expected growth rate by 0.10 (86-93) and 0.13 (start-93).

State owned firms tend to expand employment faster. The effect is significant for growth over the period from start-up until 1993. In Burundi, state owned firms have traditionally occupied a very strong position in manufacturing and a large share of the productive assets were channelled towards these firms. Under the structural adjustment program it is the purpose to reverse this trend and to strengthen the private sector. The effect of state ownership on firm growth during the period of adjustment is still positive but not significant.

The presumed effects of foreign ownership, offering firms the opportunity of sourcing abroad, are not significant. The coefficients of the sectoral variables are all positive indicating that firms in agro-industries, which is the reference sector, tend to grow more slowly.

The empirical results support the view that firm growth is essentially a process of learning over time with younger firms being able to reap strong returns in the initial years of operation as they observe that they can increase efficiency through scale enlargement. The growth process is, however, moderated by institutional factors which tend to shift the growth opportunities towards firms with a better access to resources. Legitimation in the industry through obtaining a formal status tends to facilitate access to resources thereby relaxing the barriers to growth. In a similar way, being located outside the industrial core region depresses the expected growth rate. State ownership tends to increase the firm's expansion opportunities, especially during the period before the structural adjustment program, when the institutional environment was discriminating in favour of these firms.

Following the reasoning of the models of learning, the more efficient firms survive and grow into a larger size, suggesting that older and larger firms exhibit a higher level of efficiency. Inefficient firms are forced to exit, unless, as suggested by organisational ecology models, they have an advantage over other firms in securing a share of the scarce resources for themselves which enables them to survive. In order to shed additional light on the determinants of growth, the next section presents a productivity analysis to unravel the characteristics of the more productive firms in relation to size, age and formal status. The section also investigates more in detail the kind and severity of growth barriers as they are perceived by the owners and managers of the firms.

5. Productivity and growth barriers

Labour productivity differences

Labour productivity in the growth process of firms is determined by several factors. Technologies exhibiting scale economies may explain why larger firms display substantially higher levels of labour productivity, while, through ageing, firms are able to grow into a scale at which these economies are fully exploited. Implementation of new and improved technologies may shift labour productivity to a higher level. Productivity also depends on the actual organisation of the firm which likewise improves through learning over time. Using similar technologies, productivity differences among firms may be due to differences in plant layout, division of labour, delegation of responsibilities, business culture and incentive systems. As a result, foreign owned firms may benefit from important transfers of organisational capabilities which may stimulate higher productivity levels. It is often argued that, if competition is not pushing firms to a maximum use of resources, they may become X-inefficient. Within this framework, state owned firms which are less constrained by profit requirements are often alleged to be less productive.

To test these implications empirically, labour productivity is measured by the logarithm of value-added per employee (LPROD). The explanatory variables include firm size, measured by the logarithm of sales (LSALES). Firms are classified into three age categories. The binary variable AGE1 equals one for firms aged between 10 and 20 years while AGE2 equals 1 for firms of over 20 years of age, the reference group being younger firms of less than 10 years of age. A number of variables are included to measure technological effects. INDSHARE, the share of indirect costs in total costs, is included as a proxy for capital intensity of production. The number of managers, administrative and commercial personnel as a percentage of total employment (WHITECOL) is a proxy for the human capital employed by the firm. TECACT is a binary variable equal to one if the firm spends funds on R&D or has obtained licenses. The binary variables EUROPEAN, ASIAN, SOE equal one if the majority of the equity capital is European, Asian, respectively state owned. Sectoral effects are captured by three binary variables WOOD, TEXTILES, METAL, leaving agro-industries as the reference sector. The effect of being formally registered is captured by the variable FORMAL. Estimation results are presented in table 3.

INSERT TABLE 3 ABOUT HERE

As expected, scale effects are important in explaining labour productivity differences. Higher levels of capital intensity also substantially increase firms' labour productivity. The coefficient of INDSHARE is positive and significant at the 95% level. The coefficient of TECACT is not significantly different from zero. The greater use of white collar workers in the firm does also not appear to have a net effect on labour productivity. The results might be influenced by a high correlation between both variables and with the variable INDSHARE. Firms in the textiles sector tend to exhibit higher levels of labour productivity while firms in the metal-working sector show lower levels than firms in agro-industries.

The most striking result is to observe that formal firms, while growing faster, seem to use labour input in a significantly less productive way. In a similar way, state owned enterprises show higher levels of employment growth, but tend to have significantly lower levels of labour productivity. This may point to the great importance of institutional factors interacting in the distribution of scarce resources.
Controlling for firm size, older firms are more productive than younger ones, and the effect increases with the age category as indicated by the coefficient of AGE1 and the even larger coefficient of AGE2. This result is supportive of models of learning, which suggest that firms operating in an industry are not only able to uncover their level of efficiency over time, but may also be able to improve it over time through learning and developing a more performing organisation.

In general these results provide corroborating evidence that higher levels of efficiency are obtained through growing into a larger scale and through active and passive learning over time. However, institutional factors inhibit firms from having equal access to resources and thereby depress their effective growth rates, which results in misallocation of resources and reduced overall productivity. In what follows, the different kinds of growth obstacles are further analysed in relation to the different types of firms.

Obstacles to firm growth: the owner and manager's perception

In the RPED survey, the manager or owner of the firm was asked to quantify a list of 15 factors according to the degree to which they actually constitute an obstacle to the growth of their firm. The analysis of the manager's perception complements the previous findings and contributes to a better understanding of how certain growth obstacles are related to different types of firms[6]. The list of 15 growth hampering factors was regrouped into four different types of obstacles[7]. The first and most important obstacle is *access to credit*. The second group of obstacles relates to *market conditions*, with insufficient demand and competition from local competitors and imports as constituent factors. *Regulation* on social capital, activities and location, labour regulations, price and foreign exchange controls, taxes and problems in obtaining licenses form a third type of obstacle. Finally, a lack of infrastructure and business support services and high prices of public utilities as growth obstacles are regrouped in the variable '*infrastructure*'.

[6] The answers to the question were the respondents' subjective and personal view. The questions were intended to know the sources of obstacles to growth at the moment the interview took place in 1993 and these are not necessarily identical to past growth hindrances. Nevertheless, it may be assumed that the main constraints to growth are not too variable over time.
[7] The respondents quantified the severeness of 15 growth hampering factors on a numeric scale ranging from 1 to 5, where 1 = no obstacle and 5 = severe obstacle. A lack of credit was perceived as the most constraining factor with an average score of 3.3, followed by insufficient demand (3.0) and taxes (2.8).

Each variable corresponds to the average of the constituent factors and ranges continuously on a scale from one to five. In order to uncover systematic effects, a two-way censored tobit model relates the height of the growth obstacle to the type of firm. Three binary variables classify firms in different size classes: MICRO (1-4), SMALL (5-25) and MEDIUM (26-100). The reference group taken up in the constant term are large firms with over 100 employees. The age of the firm in 1993, in logarithmic value, is represented by the variable LFIRMAGE. Sectoral, locational and ownership and formal status variables are defined as before.
The estimation results are shown in table 4.

INSERT TABLE 4 HERE

A lack of credit seems most constraining to the smallest firms and decreases systematically with the size of the firms, as indicated by the magnitude of the coefficient of the size classes. Older firms also seem to complain significantly less about credit as a growth obstacle. This is not surprising as, within the learning view, older firms should have proven over time to be among the more efficient ones. Moreover, their age also grants them an advantage of creditworthiness over younger equally efficient firms if financial markets are characterised by high transaction costs.

Market conditions, and in particular insufficient demand, are experienced as obstacles to the growth of micro-enterprises. While the low purchasing power of the population is generally considered as one of the major problems for development, micro-enterprises, which often serve the lowest segment of the market, are thereby severely hampered from growing into a larger size. Older firms complain significantly less about being constrained by market conditions, probably because they have established a position in the local market. The severity of the market constraint is also sector-related; firms in the textiles sector and in metal-working complain significantly more about insufficient demand and tough competition. Firms in the informal sector complain less about market conditions, which point to the smaller niches which they define as their relevant market.

Regulation seems to be less constraining for micro-enterprises and small firms, whose scale of operations and type of activity are less subject to regulation. It is more constraining for formal firms than for informal ones as, by definition, informal firms circumvent most of the regulatory obligations. Regulation is less an obstacle to growth for older firms and firms owned by Asians, while the opposite holds for European owned firms and firms in metal-working.

No significant differences across types of firms are observed with respect to the perception of infrastructure and business supporting services as barriers to firm growth.

In sum, the results with respect to the perceived obstacles to growth provide interesting corroborating evidence for the theoretical framework and empirical growth model presented in this paper. The constraining factors with respect to credit, the different regulatory environment and the varying competitive regimes for the different groups of firms are at the heart of the underlying firm growth processes observed in developing countries.

6. Conclusion

Consistent with results obtained for developed countries, firm growth in Burundi is subject to a learning process over time. However, the growth process is hampered by several institutional and environmental conditions which are particular to developing countries, including primarily the absence of well functioning resource and product markets. Among the constraining factors, access to credit for young and smaller firms shows up as a major constraining factor. Formally registered firms, which grow significantly faster than informal firms, report that they are more severely hampered by credit constraints, overregulation and market conditions. Informal firms on the other hand seem to focus on a mere survival objective in an unregulated segment of the economy where small scale investment and technological upgrading do not pay off.

The present framework offers some interesting perspectives for the development of a more effective and efficient policy with respect to the development of the private sector in developing countries. Firstly, the on-going implementation of structural adjustment measures requires due attention to the state of development of the credit market and an in-depth analysis of the existing market failures in both product and input markets. Secondly, the absorptive capacity of small and medium sized enterprises should be improved to enhance transfer and implementation of technology from larger companies and firms abroad. The focus of policy should therefore become more oriented towards the growth of firms after start-up. Lowering the barriers that impede informal firms from participating in the formal economy and engaging in scale enlargement with associated scale economies and learning effects, appears likewise to be crucial for the development of a more solid industrial base.

References

Audretsch, D.B. (1995), *Innovation and Industry Evolution*, Cambridge, Massachusetts: The MIT Press.

Dunne, P., Hughes, A., (1994), Age, size, growth and survival: UK companies in the 1980s, *The Journal of Industrial Economics*, 42, pp. 115-140.

Dunne, T., Roberts, M. J., Samuelson, L., (1989), The growth and failure of US manufacturing plants, *Quarterly Journal of Economics*, 104, pp. 671-698.

Evans, D. E. (1987a), The relationship between firm growth, size and age: estimates for 100 manufacturing industries, *The Journal of Industrial Economics*, 35, pp. 567-582.

Evans, D. E. (1987b), Tests of alternative theories of firm growth, *Journal of Political Economy*, 95, pp. 657-674.

Gibrat, R. (1931), *Les inégalités économiques*, Paris, Sirey.

Hannan, M.T., Carroll, G.R. (1992), *Dynamics of organizational populations; Density, Legitimation and Competition*, Oxford University Press, New York.

Hannan, M.T., Ranger-Moore, J., Banaszak-Holl, J. (1990), Competition and the evolution of organizational size distributions, in:Singh, J. (ed.), *Organisational Evolution: New Directions*, Sage, Newbury Park, CA., p. 246-268.

Ijiri, Y. and Simon, H. A. (1964), Business firm growth and size, *The American Economic Review*, 54, pp. 77-89.

Jovanovic, B. (1982), Selection and the evolution of industry, *Econometrica*, 50, pp. 649-670.

Klepper, S., Graddy, E. (1990), The evolution of new industries and the determinants of market structure, *Rand Journal of Economics*, 21, 27-44.

Kumar, M. S. (1985), Growth, acquisition activity and firm size: evidence from the United Kingdom, *The Journal of Industrial Economics*, 33, pp. 327-338.

Lucas, R. E. (1978), On the size distribution of business firms, *The Bell Journal of Economics*, 9, pp. 508-523.

Mansfield, E. (1962), Entry, Gibrat's Law, innovation and the growth of firms, *The American Economic Review*, 52, pp. 1023-1051.

McPherson, M. A. (1996), Growth of micro and small enterprises in southern Africa, *Journal of Development Economics*, 48, pp. 253-277.

McPherson, M. A., Liedholm, C. (1996), Determinants of small and micro enterprise registration: results from surveys in Niger and Swaziland, *World Development*, 24, pp. 481-487.

Mead, D. C., Morrisson, C. (1996), The informal sector elephant, *World Development*, 24, pp. 1611-1619.

Nugent, J.B. (1996), What explains the trend reversal in the size distribution of Korean manufacturing establishments?, *Journal of Development Economics*, 48, pp. 225-251.

Nugent, J. B., Nabli, M. K. (1989), *An institutional analysis of the size distribution of manufacturing establishments: an international cross-section study*, CES International Economics Research Paper n°62, 29 p.

Nugent, J. B., Nabli, M. K. (1992), Development of financial markets and the size distribution of manufacturing establishments: International comparisons, *World Development*, 20, pp. 1489-1499.

Pakes, A., Ericson, R., (1990), *Empirical implications of alternative models of firm dynamics*, Columbia University Working Paper.

Sleuwaegen, L., Goedhuys, M. (1998), *Organisational ecology and growth of firms in developing countries, Evidence from Côte d'Ivoire*, Working paper, University of Leuven.

Variyam, J.N., Kraybill, D.S., (1992), Empirical evidence on determinants of firm growth, *Economics Letters*, 38, pp. 31-36.

White, H. (1980), A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity, *Econometrica*, 48, 817-832.

Winter, S.G. (1990), Survival, selection and inheritance in evolutionary theories of organisation, in:Singh, J. (ed.), *Organisational Evolution: New Directions*, Sage, Newbury Park, CA., p. 269-297.

World Bank (1991), *Burundi, Private sector development in the industrial sector*, Report n° 9422-BU, Washington, D.C., 123p.

World Bank (IDA) (1992), *Report and recommendation of the president of the IDA to the executive directors on a proposed IDA credit of SDR 22 million to the Republic of Burundi in support of a third structural adjustment program*, 31 pp.+ann.

Table 1: Firms included in the sample

	Number of firms	Average size	Standard deviation
All firms	120	75.7	215.9
By start-up year			
1947-73	18	146.8	227.2
1974-83	24	129.5	346.6
1984-88	34	20.0	22.7
1989-93	44	60.2	193.7
By sector			
Agro-industries	40	132.6	267.8
Textiles	31	85.0	285.1
Wood-working	25	18.5	19.5
Metal-working	24	28.3	39.0
By formal status			
Formal	79	112.2	259.2
Informal	41	5.4	5.7

Table 2.:Regression results for employment growth over the period start-up-'93 and 1986-'93

	1986-1993	start-1993
AGE	-0.610 ***	-0.504 *
	(-2.577)	(-1.919)
AGE^2	0.081	0.076
	(1.380)	(1.405)
SIZE	-0.233 ***	-0.155
	(-3.001)	(-1.164)
$SIZE^2$	0.000	-0.006
	(0.023)	(-0.327)
AGE*SIZE	0.057	0.033
	(1.490)	(0.815)
FORMAL	0.444***	0.310***
	(4.441)	(5.241)
EUROPEAN	-0.022	-0.071
	(-0.249)	(-1.299)
ASIAN	-0.055	-0.062
	(-0.946)	(-1.145)
SOE	0.242	0.235 *
	(1.481)	(1.651)
OUTBUJA	-0.103 *	-0.126 **
	(-1.653)	(-2.339)
WOOD	0.193 **	0.103
	(2.100)	(1.213)
TEXTILES	0.062	0.034
	(0.696)	(0.370)
METAL	0.075	0.052
	(0.852)	(0.742)
Constant	0.802 ***	0.752 **
	(3.193)	(2.208)
R-Adj.	0.3133	0.1812
F (13,60)	3.562	
F (13,65)		2.328

To correct for heteroscedasticity, standard errors are estimated using White's consistent estimator (White, 1980).
Asymptotic t-ratios are in parentheses; Significance levels: * 99%; ** 95%; * 90%.**

Table 3. Regression results for labour productivity differences

dependent variable: log (value added/employee)

LPROD=	3.61	+0.58 LSALES	+1.35 INDSHARE	-0.01 WHITECOL	-0.02 TECACT				
	(20.64)	(6.00)	(1.98)	(-0.01)	(-0.05)				
	+0.04 WOOD	+0.50 TEXTILES	-0.98 METAL	+0.30 AGE1	+0.94 AGE2				
	(0.19)	(2.48)	(-4.17)	(1.34)	(2.55)				
	-0.70 FORMAL	-0.14 EUROPEAN	+1.83 ASIAN	-1.58 SOE					
	(-3.82)	(-0.26)	(2.27)	(-1.96)					

adj. R^2=0.48; F(13,73)=5.183;

Results are corrected for heteroscedasticity; Asymptotic t-ratios are in parentheses

Table 4. Perceived obstacles to growth

Dep. Var:	Access to credit	Market conditions	Regulation	Infrastructure
D-MICRO	9.647 **	1.146 *	-0.443 **	0.461
	(5.444)	(3.076)	(5.172)	(0.963)
D-SMALL	5.376	-0.250	-0.307 **	-0.322
	(2.697)	(0.209)	(4.036)	(0.686)
D-MEDIUM	3.127	0.246	0.025	-0.136
	(1.014)	(0.219)	(0.030)	(0.129)
LFIRMAGE	-2.119 *	-0.541 ***	-0.136 **	-0.185
	(3.263)	(8.001)	(5.712)	(1.749)
FORMAL	0.576	1.125 **	0.254 *	0.009
	(0.049)	(5.700)	(2.870)	(0.001)
EUROPEAN	0.340	0.136	0.321 *	-0.126
	(0.011)	(0.055)	(3.829)	(0.089)
ASIAN	0.657	-0.695	-0.364 *	-0.217
	(0.023)	(0.932)	(2.851)	(0.162)
SOE	-4.298	-0.087	-0.115	0.064
	(1.333)	(0.021)	(0.469)	(0.023)
OUTBUJA	-0.067	-0.089	-0.125	0.130
	(0.001)	(0.043)	(0.949)	(0.183)
WOOD	3.191	0.046	-0.193	0.014
	(1.389)	(0.010)	(1.801)	(0.002)
TEXTILES	-1.298	1.036 **	-0.100	-0.446
	(0.264)	(5.728)	(0.612)	(2.056)
METAL	3.245	1.190 **	0.091	-0.005
	(1.414)	(6.272)	(0.419)	(0.001)
constant	1.911	1.579 **	1.659 ***	2.598 ***
	(0.213)	(4.590)	(61.776)	(24.410)
σ	6.931	1.417	0.415	1.063
	(21.5)	(104.2)	(113.2)	(145.8)
N	102	102	99	101
Log likelihood	-114.2	-147.0	-58.6	-140.2

***X^2* -ratios are in parentheses; Significance levels: *** 99%; ** 95%; * 90%.**