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**Employment Creation and Employment Quality  
in African Manufacturing Firms**

by

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InFocus Programme on Boosting Employment  
through Small Enterprise Development  
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## Foreword

The role of micro and small enterprises in providing employment has received increased attention in recent years. However, too little is still known on the performance of small versus large firms in terms of employment creation and the factors explaining differences in employment growth as well as the quality of jobs created by enterprise size. Analyses have so far mainly focused on developed countries and, due to lack of data availability, studies on developing countries are often not longitudinal, or rely on a subset composed of formal enterprises or enterprises above a certain size.

Developing the knowledge base on the employment dynamics of micro and small enterprises in the formal and informal sector is one specific area of work of the InFocus Programme on Boosting Employment through Small Enterprise Development (IFP/SEED) of the International Labour Organization. Investigating in more depth the reasons behind success and failures (personal and other non-business failure factors versus business failure) and the role that the policy environment might have in explaining such performances is an important area of SEED's work, especially from a point of view of policy design. The business environment may impose several barriers to the expansion of firms, with a differential impact on firms of different size.

This study, applying econometric methods to a unique longitudinal data set of Tanzanian manufacturing firms put together by the World Bank, explores differences in net employment creation in firms of different sizes, and relates them to characteristics of firms and entrepreneurs and the business environment. Compared to larger firms, micro and small firms, as well as younger firms, grow faster but suffer from a higher variability of their growth rate, in Tanzania as well as in other African countries. In addition, entrepreneurs' wealth and level of academic education are found to have a significant positive impact on firms' performance and their capacity to generate additional employment.

The lack of access to inputs is a major external constraint to growth, especially for informal small enterprises. In Tanzania as well as in other African countries, the unfriendly business environment might be at the origin of the "missing middle" as small firms are forced to remain small and informal. Formality, by facilitating access to inputs, relieves one of the highest constraints faced by MSEs. Interestingly, despite high barriers to entry into the formal sector, econometric evidence points out to the superior employment creation potential of small formal firms compared to informal ones. These findings confirm that creating a conducive environment for small enterprises can make a substantial contribution to employment creation and increase productivity and wages.

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## **Executive Summary**

The role of micro, small and medium sized enterprises in employment creation has increasingly received attention in development policy debates and among academics. It has led many governments to implement policies aimed at stimulating entrepreneurship and small business development. However, while these policies are currently being implemented, still too little is known about the performance of small versus large firms in terms of employment creation capacity. The literature on entrepreneurship and firm growth is indeed at some points controversial. For developing countries, empirical evidence supporting the debate is poorly provided, mainly due to a shortage of data availability. Moreover, the quality of jobs created, job stability, working conditions and remuneration levels have received insufficient attention in the literature.

This paper addresses this caveat and attempts to shed light on employment creation in firms of different size and formal status by exploring a data set of Tanzanian manufacturing firms. This paper explores small firms' potential for employment creation. More specifically, using a sample of surviving firms, differences in net employment creation in firms is explained by differences in firm size and age and a number of basic firm characteristics. Constraints to additional employment creation are examined and the findings for Tanzania are compared to results from other countries. Finally, the paper looks at some qualitative aspects of employment in firms of different size and formal status.

When analysing employment growth, one determinant that comes out strongly is the initial size of the firm. Micro and small firms are found to grow faster, yet variability is also high. The failure rate of small firms is quite high, but in those firms that survive, perspectives for employment generation are positive. Among the surviving firms, micro firms are growing fast, not only in Tanzania but also elsewhere in Africa.

While this is a hopeful sign, the under-representation of medium sized firms remains puzzling. Indeed, while transition from micro firms to a slightly larger size is quite common, firms seem to stagnate somewhere in the 5-25 employed persons size range, a typical feature in African manufacturing. The missing middle in the size distribution of firms observed in many African countries is the result a business environment that imposes certain obstacles to the growth of small firms. When the entrepreneurs speak for their own firms, a lack of credit, infrastructure, and business support services seem to be at the origin of the stagnation, besides a weak demand for their product which is inherent to the low purchasing power of their clients and common to all firms. Strikingly, most studies tend to uncover a lack of inputs as constraining enterprise development. However, it seems to affect firms of different size and formal status in a different way.

In their competition for resources informal and small firms find themselves in a disadvantaged position compared to formal or larger competitors. Formality facilitates access to inputs, improves a firm's legitimacy in the industry, creates a reputation of

trustworthiness in the eyes of clients and suppliers, and makes the firm less prone to corruption and harassment by police. However, evidence from Tanzania shows that barriers to entry into the formal sector are very high. These barriers are probably at the origin of the observed duality in African economies, as small firms do not have the scale to overcome the cost of entry into the formal sector and are forced to remain small and with little visibility.

The consequences of this duality are far-reaching. Economies of scale that exist in most industries remain largely unexploited, with resultingly low levels of profitability and investment, in turn leading to low labour productivity and low wages. The quality of employment is also related to size and formality. In large and formal firms, job and social security, remuneration and human resource development are clearly superior.

The findings suggest that firms located in the small size class, challenged to become formal seem to have superior employment creation potential. Entrepreneurs with higher levels of formal education appear to be able to create additional employment, and to manage operations on a larger scale. At the same time, efforts should be oriented toward decreasing the barriers posed by the formal registration procedure. The cost of gaining information about registration and the process of registering are unnecessarily high.

## 1. Introduction

In recent years, the role of micro-, small and medium sized enterprises in employment creation has increasingly received attention in development policy debates. After the massive failure of state-owned enterprises in creating a solid industrial base, the focus of attention was shifted towards small-scale private enterprises for the development of a dynamic economy and for the generation of jobs and income for the mass of urban poor. This policy evolution has also been observed in Tanzania, which evolved from a socialist economy with strong government participation in the productive sector, towards a liberalized economy with an emphasis on private activities.

At the same time, and driven by a private sector oriented development approach, many countries started the development and implementation of an SME policy, which finds its justification based on several arguments. First and foremost, small and medium sized enterprises (SMEs) tend to generate employment and income for the poorest and most disadvantaged groups of people in the society. Therefore, stimulating the creation of small firms and their subsequent growth is expected to have a strong leverage effect on the standards of living of the poor. Hence the stimulation of SMEs is justified on the grounds of income redistribution.

Second, a policy tailored for SMEs deserves support in poorly developed markets where transaction costs are high. The fixed costs related to obtaining information necessary for business operations are the more constraining the smaller the size of operations. Due to the existence of fixed costs for the obtention of the necessary inputs, small firms are inherently in a disadvantaged position to gain access to resources of different kinds, including credit, infrastructure, upgraded technology, access to markets and information.

Finally, in developed countries, new business startups and growth are lying at the heart of a dynamic economy where “creative destruction” entails economic and technological progress. Therefore, merely on promotional grounds, governments in developing countries have also shifted attention away from former, inefficiently working, large-scale enterprises to focus more on entrepreneurship and small business growth for the modernization of the economy.

However, while these policies are currently being implemented, still too little is known about the performance of small versus large firms in terms of employment creation capacity.<sup>2</sup> Indeed, the literature on entrepreneurship and firm growth underlying the policy debate is large and in some cases controversial. First, most of the research on employment creation in relation to firm size is based on data for industrialized countries. For developing countries, the field is still largely unexplored and evidence is poorly provided, due mainly to a shortage of data availability. For developing countries, evidence is all too often based on a subset of the population of firms, mostly formal firms or firms above a certain size. Second, on the role of micro- and informal firms in (quality) employment creation little is documented. The quality

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<sup>2</sup> Besides employment creation, other performance indicators such as innovative capacity, technological capabilities etc....are also studied.

of jobs created, job stability, working conditions and remuneration levels have insufficiently received attention in the literature.

This paper addresses this caveat and attempts to shed light on employment creation in firms of different size and formal status, by exploring a data set of Tanzanian manufacturing firms. In Tanzania, like elsewhere in sub-Saharan Africa, the share of employment in small-scale enterprises has been large and growing in manufacturing.<sup>3</sup> The Government of Tanzania is also in the process of implementing a SME policy to foster employment creation and income generation in this sector. This paper explores small firms' potential for employment creation. More specifically, using a sample of surviving firms, differences in net employment creation in firms is explained by differences in firm size and age and a number of basic firm characteristics. Constraints to additional employment creation are examined and the findings for Tanzania are compared to results from other countries. Finally the paper looks at some qualitative aspects of employment in firms of different size and formal status.

The data used for the analysis were gathered within the framework of the World Bank project "Regional Program on Enterprise Development (RPED)", carried out in Tanzania in 1993, 1994 and 1996. Survey data were collected through intensive interviews with owners and managers of about 200 manufacturing firms active in one of the four main manufacturing sectors: food processing, textiles, woodworking and metal-working. The interviews were conducted in the three respective years 1993, 1994 and 1996, to follow up on the firms' conduct in a changing environment. In the sampling procedure, the main objective was to have a sample that represents the entire spectrum of firms active in the selected industries, including informal firms. This makes the sample unique in that it includes both formal<sup>4</sup> and informal firms and firms of very different size, age, legal status and ownership structure. As such, micro-enterprises without legal status and operating in the informal sector are also included. The firms are sampled from Dar es Salaam, Morogoro, Arusha, Tanga, Mwanza and Iringa, the major centres of industrial activity.<sup>5</sup> Table 1 presents the size distribution of the sample firms by age category, location, formal status and industry.

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<sup>3</sup> Recent data on the size distribution of firms are largely missing and date back to 1988 (Survey of Industrial Production, Bureau of Statistics, Planning Commission) and 1989 (Central Statistical Office). A rough estimate indicates that of a total of 491,379 persons active in manufacturing in 1990 (ILO Statistics on Economically Active Population, 2000), 1.7 per cent are working in firms with 10-50 employees, and 21.5 per cent in larger firms (derived from 1988 Survey of Industrial Production). The residual 76.8 per cent of persons are working in micro and small firms.

<sup>4</sup> Formal firms were sampled from a census of the Bureau of Statistics, 1992, which was based on employment in 1989. It is hypothesized that the census is made up from listings of registered firms. Informal firms were randomly selected among firms of up to five employees.

<sup>5</sup> For a detailed description of the sampling procedure and changes in the composition of the sample, I refer to the RPED analytical report "Industrial change under structural adjustment: Tanzania 1993-1996", Center for International Business Research, Helsinki School of Economics, February 1997.

**Table 1: Size distribution of sample firms, by age category, location, formal status and industry**

	1-4	5-25	26-99	100+	Total
<b>FIRM AGE</b>					
1-5 years	18	14	2	0	34
6-10 years	27	19	9	3	58
11-15 years	8	12	12	3	35
16+	17	58	34	21	130
<b>LOCATION</b>					
Dar es Salaam	36	47	29	12	124
Morogoro	11	10	4	5	30
Tanga	5	7	4	3	19
Arusha	10	16	8	4	38
Mwanza	8	12	11	3	34
Iringa	0	11	1	0	12
<b>FORMAL STATUS</b>					
Informal	55	19	4	0	78
Formal	15	84	53	27	179
<b>INDUSTRY</b>					
Food processing	8	12	6	9	35
Textiles	20	21	10	11	62
Woodworking	19	40	20	4	83
Metalworking	23	30	21	3	77
<b>Total</b>	<b>70</b>	<b>103</b>	<b>57</b>	<b>27</b>	<b>257</b>

The objective of the survey was to get a complete screening of the firms in terms of their past growth performance and future perspectives, and to assess the institutional aspects of the African context that may have an impact on the behaviour and performance of the firms. Hence, a large set of questions was asked on the history of the firm, its past and current performance, the background of the entrepreneur and manager, the composition and working conditions of the labour force and the firm's major growth impediments, among other aspects.<sup>6</sup> The rich data set thus established allows for the investigation of the performance indicators (including employment growth) of different firms, relating them to characteristics of firms and entrepreneurs, and the business environment.

The major limitation of the data set is that it only allows investigating employment flows within existing firms, surviving over the period under study. It does not provide any information on the employment creation and destruction by entry of new firms and exit of existing firms. As turbulence can be high, especially among smaller firms, employment flows by firm births and deaths may be significant.

<sup>6</sup> Including acquisition and status of equipment and technological capabilities, the firm's position in financial markets, labour markets and product markets, its relationship with suppliers, clients, competitors and access to infrastructure.

The structure of the paper is as follows: The next section briefly reviews some of the relevant literature and stylized facts on employment growth and entrepreneurship and advances some hypothesis for testing. Section three investigates the employment creation performance of firms of different size, age and formal status in the Tanzanian manufacturing sector over the period 1984-1995. It highlights characteristics of the more successfully growing firms and their owners or managers and uncovers the constraints to growth for firms of different size. Section four compares the findings to results obtained for other sub-Saharan African countries, where the RPED study has been conducted. In section five some qualitative aspects of employment are analysed along the firm size and formal status dimension. Section six concludes.

## **2. Employment creation: Definition and stylized facts**

### *Definition of employment*

The Resolution concerning statistics of the economically active population, employment, unemployment and underemployment, adopted by the Thirteenth International Conference of Labour Statisticians (Geneva, 1982), gives the following definition of employment:

“Employed” persons are those persons above a specific age who during a specified brief period, either one week or one day, were in the following categories:

*Paid employment* (1) “at work”: persons who, during the reference period performed some work for wage or salary, in cash or in kind; (2) “with a job but not at work”: persons who, having already worked in their present job, were temporarily not at work during the reference period but had a formal attachment to their job;

*Self-employment* (1) “at work”: persons who, during the reference period, performed some work for profit or family gain, in cash or in kind; (2) “with an enterprise but not at work”: persons with an enterprise, which may be a business enterprise, a farm or a service undertaking, who were temporarily not at work during the reference period for some specific reason.

In line with the aforementioned definition, the data set used in this analysis covers as much as possible the full spectrum of “employed” persons. As such, the number of full-time workers, part-time workers, permanent and casual workers, seasonal workers and apprentices were explicitly asked for, irrespective of whether or not a formal contract existed. They were considered “employees” if they received a salary. Unpaid family workers, if any, were not included in the labour force. In sole proprietor firms, where the owner was the only worker, employment is set to equal one.

In order to get an idea of the size of firms that allows making inter-firm comparisons and assigning firms to different size classes, it was felt that one indicator of total employment had to be calculated. Therefore, a correction is made to reduce

the weight of part-time and casual workers in the total labour force and to make the firm size indicator correspond to permanent full-time employment.

### *Employment creation*

Employment is created through the start of new “firms”, including self-employment, and through the expansion of existing firms. Employment destruction occurs when firms exit or contract, entailing firing of workers. Net employment creation is the difference between employment creation and employment destruction.

As this paper is based on a sample of firms that have survived over a specific period, the analysis focuses on employment creation and destruction through firm expansion and contraction. Therefore, in what follows, employment “growth” will be emphasized, which can be either positive or negative.

### *Stylized facts*

In the literature on firm growth a number of robust relationships are typically found.<sup>7</sup> We here highlight some of the major robust findings:

1. *Many empirical studies applying to different countries and time periods find a negative relationship between firm size and growth and between firm size and the variability of growth rates.*

Or, small firms grow faster but their growth rates vary strongly. Consequently, turbulence (entry and exits) may be very high in the smallest size classes (Mansfield, 1962, Evans, 1987a, Kumar, 1985, Dunne and Hughes, 1994, Dunne, Roberts and Samuelson, 1989).

That smaller firms grow faster can theoretically be explained by the existence of diminishing returns to scale. In this context, smaller firms can reap relatively more cost advantages than do larger firms and therefore they grow faster. In a related line of reasoning, technological variables such as high capital requirements and large economies of scale increase the minimum efficient scale of operations. From this perspective firm growth is a dynamic process that leads firms to attain their equilibrium size, which is at least the minimum efficient scale of production. Once the minimum efficient scale is reached, the incentive for growth is much smaller.

2. *Empirical studies systematically find a negative relationship between firm age and growth and between firm age and variability in growth rates.*

Or, younger firms tend to grow faster but their failure rates are also higher. This observation is theoretically explained by “models of learning” (Lucas, 1978, Oi, 1983, Jovanovic, 1982, Pakes and Ericson, 1990). These models state that firms and managers of firms learn about their efficiency once they are established in the industry. Firms expand their activities when managers observe that their estimation of managerial efficiency has understated actual levels of efficiency. As a firm ages, the manager’s estimation of efficiency becomes more accurate, decreasing the probability that the output will widely differ from one year to another. Older firms therefore grow more slowly than younger ones and their growth rates are relatively stable

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<sup>7</sup> Firm growth is typically measured by sales, employment or assets.

(empirical evidence in Evans, 1987, Dunne and Hughes, 1994, Dunne, Roberts and Samuelson, 1989 and for developing countries: McPherson, 1996, Sleuwaegen and Goedhuys, 2002). In equilibrium, this would imply that the size distribution of firms follows the underlying distribution of managerial endowments incorporated in the population, with better managers running larger firms. In models of “active” learning, people can also raise their efficiency, through formal education and training that increase their endowments. Firms of entrepreneurs or managers with higher formal education, work experience and training would therefore be expected to grow faster, all else equal.

In a more dynamic setting, this process of creative destruction allows younger firms to enter with upgraded and more innovative technology while older firms have invested in the past in durable equipment and may lag behind newer and superior technology.

3. *A relatively small number of firms maintain persistently high growth rates, thereby accounting for the bulk of employment growth.*<sup>8</sup>

The group of persistent growers is very small though, especially in developing countries, where number of firms that makes the transition from a small firm to a large established corporation is extremely low, and lower than in developed economies (Sleuwaegen and Goedhuys, 2002). The vast majority of firms are active in the smaller size categories, where turbulence and job turnover is extremely high. Consequently, the size distribution of firms is highly dual in developing countries. An overwhelming number of micro and small firms account for the bulk of employment; firms of medium size are relatively underrepresented, and a few very large firms at the other end of the scale account for the majority share of production. The relative lack of medium-sized firms is puzzling, as small firms are found to grow faster and would therefore be expected to make the transition to the mid range of firms.

While these findings on the relationship between firm growth on the one hand and size and age on the other hand are highly robust, a few comments need to be raised that may be important for this paper.

First, some influential studies may be methodologically flawed, and may find a negative firm size–firm growth relationship due to a statistical problem known as “regression to the mean”. This would imply that the employment creation potential of small firms is overestimated, and small firms are found to grow faster because they merely adjust after a temporary shock. One solution to this problem is to analyse firm growth in relation to its average or end size instead of its initial size, and some studies indeed correct this statistical problem. However, in developing countries where the majority of employment takes place in small and micro enterprises, one may severely question the idea that small firms are small due to a temporary shock. Rather than to focus on this potential bias and its effect on the size-growth relationship, it is more interesting to examine, within size classes, which firms are growing more successfully and what reasons lie behind their persistent growth.

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<sup>8</sup> The presence of extreme and persistent growers can be traced by comparing median and average growth rates and finding divergence of both rates.

Second, the size-growth relationship may be affected when a sample of surviving firms is analysed, as is the case here. A sample of surviving firms includes mainly the successful firms. As the variability in growth rates and consequently also the hazard rates are higher among smaller firms, unsuccessful small firms are more likely to be excluded from the sample than unsuccessful larger firms, which may survive over a longer time despite contraction. A selection bias may therefore lead to an overestimation of small firm growth.

Third, it should be noticed that most studies focus on quantitative aspects of employment creation (job count) and fail to pay attention to qualitative characteristics of employment, which are nevertheless important from a welfare point of view. Job quality refers to remuneration levels — where salary payments, working hours, fringe benefits and equal opportunities are adequately provided; job security — where employment contracts and the length of tenure provide a sense of long-term stability for workers; social protection — where mechanisms for health, life, disability and unemployment insurance, as well as pension schemes, child care, and maternity leave are in place; and human resource development — where workers are treated as an integral and valuable asset to the enterprise, provided with education and training opportunities; Whilst it is recognized that many small enterprises do not provide employment of this type, it is essential that such qualitative aspects become an integral part of job creation in this sector and of the research on employment dynamics by size classes.

Finally, from a point of view of policy design, it is important, not only to find correlations between growth and firm characteristics, but also to examine what determines successful firm growth and what is constraining firms in their growth performance. In this respect, the business environment may impose several barriers to the expansion of firms, with a differential impact on firms of different size.

#### *Barriers to the growth of firms*

Insufficient capital to start-up a business or to expand activities is among the most important economic barriers to small firm development. Recent empirical findings, both for developing countries and Western economies alike, suggest that capital markets discriminate against individual entrepreneurs and entrepreneurial firms and they point at the role of personal and informal financing, implying that the entrepreneur takes the risk of his venture.<sup>9</sup> In developing countries liquidity constraints are even more pronounced and entrepreneurs have to finance their venture with own savings and informal loans.

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<sup>9</sup> Evans and Leighton (1989) find that switches from wage employment to self-employment are more likely if the individual disposes of more assets. In a similar view Evans and Jovanovic (1989), Blanchflower and Oswald (1990), van Praag and van Ophem (1994) and Holtz-Eakin et al. (1994a and 1994b) find empirical support for binding liquidity constraints using US or UK data. Using data of German firms Audretsch and Elston (1994) find evidence of post-entry liquidity constraints which are more severe for smaller firms than for their larger counterparts. Using data of manufacturing firms in Côte d'Ivoire, Goedhuys and Sleuwaegen (2000) found that financial constraints play a major restraining role for entrepreneurship and firm growth. The ILO, SEED "MSE surveys" done in seven countries (Pakistan, Thailand, South Africa, Tanzania, Chile, Peru and Guinea) to assess the impact of the policy environment, also uncovered the existence of financial constraints to the growth of small firms.

Closely related to this is the on-going discussion on the impact of being a formally registered firm. Registration provides firms with an institutional standing in the eyes of law-enforcing agencies, consumers, suppliers, police officers and other key actors and facilitates contractual relationships with clients and suppliers and third parties. Formal firms are not only better positioned in output markets; they can also gain better access to scarce resources. Therefore, the formal status may grant legitimacy and open up additional growth opportunities. However, formality can only be obtained at a cost that is so high that small firms are not in a position to overcome it. The process of registering is very costly<sup>10</sup> and the mere collection of information about registration, the registration process itself and the subsequent taxation and fulfillment of regulations imposes a very high barrier to entry into the formal sector, and hampers the smooth transition of micro firms toward a larger size.

Additionally, other factors, related to the socio-economic and cultural context of a country, may impose barriers to the start up and successful expansion of small firms. In this respect, the gender factor has increasingly received attention. Despite a number of exceptions, only a small proportion of large-scale entrepreneurs in developing countries are women. Very often cultural norms impose restrictions on the possibilities of women to become self-employed, often related to an even more difficult access to credit.

### **3. Net employment creation in manufacturing firms in Tanzania**

In this section, the impact of firm size on employment creation is under study. This includes the presentation of average and median growth rates for firms in different size classes, at the beginning and the end of the period under study. Subsequently, growth differentials are related to other relevant firm characteristics, including age, sector,<sup>11</sup> location,<sup>12</sup> and formal status. A multi-variate analysis uncovers the relative importance of the different determinants for growth.

The analysis subsequently focuses on a subset of firms, namely on the entrepreneurial firms. As some data on the background of the entrepreneur are available, the impact of entrepreneur-specific characteristics on the employment creation potential can be tested.

Finally, the owners and managers present their view on what hampers their business most.

#### *Employment growth and firm size*

Historical employment data are available for the years 1984, 1988, 1990, 1991 and 1992, and for the year in which the firm was established. Moreover, “actual” data on employment were collected during the three interview rounds, representing the

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<sup>10</sup> ILO’s “Informal Sector Roadmap, a qualitative analysis of constraints and coping strategies of micro and small enterprises in Tanzania” provides interesting information on the difficulties awaiting micro and small entrepreneurs who want to comply with the law when registering a business. Eight persons went through the exercise of registering a new business, and reported the costs and time needed to do so.

<sup>11</sup> As technological conditions are industry specific, the perspectives and incentives for growth may strongly differ for firms active in different industries.

<sup>12</sup> The availability of inputs and the opportunities for networking tend to be location related and therefore firms located in urban centres and industrial districts may exhibit superior growth performance.

situation in 1993, 1994 and 1995. This makes it possible to analyse growth over different time periods, from the start until 1995, or over more homogenous periods from 1984-1990, 1990-1995.<sup>13</sup> Given that a large number of firms are relatively young, analysing growth over the period 1984-1990 reduces the sample size considerably. Therefore the analysis mainly focuses on the period 1990-1995. For firms established during this period, growth is analysed from the start until 1995.

Compound annual employment growth rates are calculated for the individual firms. Tables 2 and 3 show the employment growth rates for firms of different size. In table 2 firms are classified according to their size in 1990 (or at the start for firms starting in the period 1990-1995). Table 3 classifies firms according to their size in 1995.

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<sup>13</sup> Yearly growth rates may reflect temporary fluctuation, rather than structural changes in employment. From the comparison with other RPED studies (see further in the text), it is understood that analysing yearly growth rates does not provide any robust or significant insights.

**Table 2: Growth of firms over the period 1990-1995, classified by size in 1990**

	Micro	Small	Medium	Large
Size in 1990/start	1-4	5-25	26-99	100+
Average growth rate	15.1	-0.6	-7.8	-8.8
Standard deviation	25.8	14.0	14.6	11.7
Median growth	3.3	0.2	-6.1	-5.6
T-test significance	***		***	***

Note: <sup>a</sup>T-test for differences in mean values between firms in the respective size class and the rest of the sample firms. See also footnote. <sup>14</sup>

Significance levels: \*\*\* 1% level; \*\* 5% level; \* 10% level.

**Table 3: Growth of firms over the period 1990-1995, classified by size in 1995**

	Micro	Small	Medium	Large
Size in 1995	1-4	5-25	26-99	100+
Average Growth	-2.6	5.1	-1.9	-3.0
Standard deviation	19.7	21.7	17.5	6.7
Median growth	0.0	1.1	-1.8	-3.1
T-test significance <sup>a</sup>	*	***		**

Note: <sup>a</sup>T-test for differences in mean values between firms in the respective size class and the rest of the sample firms. See also footnote 13.

Significance levels: \*\*\* 1% level; \*\* 5% level; \* 10% level.

As can be seen from table 2, smaller firms exhibit higher average annual growth rates. At first glance, employment seems to expand in small enterprises while larger firms contract. Micro firms increase employment at an average yearly rate of 15.1 per cent against — 7.8 per cent and — 8.8 per cent for medium and large firms. However, the standard deviation and median growth rate are also included in table 2 and they correct the picture. For micro firms, the median growth rate is 3.3 per cent. This implies that the distribution of growth rates is skewed and that a few strong growers pull away from the rest.<sup>15</sup> This finding provides additional evidence supporting stylized fact 3 discussed earlier. The variance of the growth rates is also

<sup>14</sup> A T-statistic can be used to test the null-hypothesis that the mean values of two subgroups of observations in a data set are equal. In this case it is used to test the hypothesis that the mean growth rate of e.g., micro-firms, is equal to the mean growth rate of all other firms. In a similar way, it is used here to test the hypothesis that the mean growth rate of small firms is equal to the mean growth rate of all other firms, etc. for other size categories. Mean growth rates are computed for each of the two subgroups of firms. The T-test examines the hypothesis that the true means are the same. The computed T-statistic is based on the assumption that the variances of the two sub-groups are unequal, as one can deduce from theory and evidence that the variance of growth rates is higher in smaller size classes. The approximate T-statistic for testing the equality of means  $x_1$  and  $x_2$  from two independent samples with  $n_1$  and  $n_2$  observations under the assumption of unequal variances  $s_1$  and  $s_2$  is computed as:

$$T = (x_1 - x_2) / \sqrt{(s_1^2/n_1 + s_2^2/n_2)}$$

The statistic follows the T-distribution. Intuitively, larger differences in mean values  $x_1$  and  $x_2$  generate larger values for the T-statistic, and a greater probability that the null-hypothesis will be rejected. As is the case in table 2, the hypothesis that e.g., micro firms, have average growth rates that are equal to the rest of the sample is rejected. The probability that we reject the null-hypothesis incorrectly is less than 1 per cent.

<sup>15</sup> A T-test rejects at the 1 per cent confidence level the hypothesis that the growth rates would follow a normal distribution. Even when the test is performed on the growth rates for the different size classes in 1990, the test rejects the hypothesis that growth rates are drawn from a normal distribution, except for the medium sized firms. This implies that a few firms show extreme growth rates, thereby accounting for a large share of employment dynamics in their size class.

high, as is usually found for very small firms. Nevertheless, the micro firms seem to have the best employment creation performance over the period 1990-1995.

For the larger size classes, the difference between mean and median growth rates is smaller. Both are negative, and show that medium and large firms have contracted over the period under study. Firms that were small in 1990 seem to have stagnated.

Table 3 complements the findings. Firms that were still micro firms in 1995 or that became micro firms were obviously the least successful growers. Their growth rates were on average  $-2.6$  per cent with a median growth rate of 0, or stagnating firms. Those firms that moved up from micro to small firms seem to have been the most successful category of firms, along with firms growing within the small size class. The average growth of firms ending as medium sized firms or large firms is negative, implying that firms employing more than 25 persons have had difficulties maintaining their employment level over the period 1990-1995. In sum, the best performing firms in the sample are the micro firms, some of which have successfully expanded to generate employment to five or more persons. Also within the size class 5-25 employed persons, some growth may have taken place.

To illustrate this further, table 4 classifies firms according to their employment level in 1984, 1990 and 1995. Table 4A shows how firms of different size in 1984 have made the transition to a larger size class in 1995. Similarly, tables 4B and 4C show how firms have moved up in the size distribution over the periods 1984-1990 and 1990-1995 respectively.

It can be seen that in general, about one-third of the micro firms succeed in making the transition towards a small size. However, they hardly ever grow beyond the size of 25 employed persons, not even over a period of 11 years. Similarly, less than 20 per cent of the small firms move up to the mid size class, findings that are typical for African manufacturing and that are in contrast to evidence for Western economies. Medium-sized firms have struggled to maintain their employment levels, and were more successful in doing so in the period 1984-1990 than over 1990-1995.

It should be repeated that the findings may be affected by a selection bias. Unsuccessful micro and small firms are unable to survive. Therefore they are less likely to be represented in our sample as compared to unsuccessful larger firms who may survive over a longer period of time, despite contraction. The seemingly superior growth performance of small firms will also be put into better perspective further in the text when firm size is analysed jointly with other firm characteristics (multivariate analysis).

**Table 4A: Transition matrix 1984-1995**

Size in 1984	Size in 1995				Total
	1-4	5-25	26-99	100+	
1-4	29	16	1	0	46
	63.04	34.78	2.17	0.00	
5-25	11	51	13	0	75
	14.67	68.00	17.33	0.00	
26-99	1	10	14	4	29
	3.45	34.48	48.28	13.79	
100+	0	3	3	20	26
	0.00	11.54	11.54	76.92	
Total	41	80	31	24	176

**Table 4B: Transition matrix 1984-1990**

Size in 1984	Size in 1990				Total
	1-4	5-25	26-99	100+	
1-4	26	12	0	0	38
	68.42	31.58	0.00	0.00	
5-25	1	59	13	0	73
	1.37	80.82	17.81	0.00	
26-99	0	7	15	7	29
	0.00	24.14	51.72	24.14	
100+	0	0	4	21	25
	0.00	0.00	16.00	84.00	
Total	27	78	32	28	165

**Table 4C: Transition matrix 1990-1995**

Size in 1990	Size in 1995				Total
	1-4	5-25	26-99	100+	
1-4	46	16	0	0	62
	74.19	25.81	0.00	0.00	
5-25	14	82	5	0	101
	13.86	81.19	4.95	0.00	
26-99	2	15	21	2	40
	5.00	37.50	52.50	5.00	
100+	0	1	8	24	33
	0.00	3.03	24.24	72.73	
Total	62	114	34	26	236

*Employment growth and firm age, formal status, industry and location*

Table 5 presents employment dynamics of firms of different age, formal status, industry of activity and location. As expected, younger firms grow faster than older ones. Firms of up to five years of age grew on average by 11.4 per cent over their short period of existence, but variability in growth rates within this age cohort is high. For firms of six to ten years of age in 1995, employment has expanded at an average annual rate of 5.0 per cent. Employment in firms that existed before 1980 has decreased significantly.

Employment in food processing has been severely hit, while firms in woodworking and textiles succeeded in expanding employment by an average 4.2 per cent and 5.2 per cent yearly.

Firms in Mwanza have been more successful, while the opposite holds for firms in Arusha.

Finally, informal firms seem to have strongly and significantly outperformed their formal counterparts. There is no real explanation for this finding. Informal firms may well be able to evade taxes imposed on firms, but at the same time they forego the benefits of being registered and enjoying a legitimate status that opens up the path to resources needed for growth. A multivariate analysis is needed to disentangle the effect of being informal from the impact of being a small or young firm.

**Table 5: Average growth of firms 1990-1995, by industry, age, formal status and location**

	Average growth	Number of firms	T-test significance
Age cohort			
1-5 years	11.4	32	***
6-10	5.0	46	
11-15	2.6	34	
16+	-3.3	124	***
Industry			
Food processing	-11.6	32	***
Woodworking	4.2	77	*
Textiles	5.2	56	
Metalworking	0.4	71	
Location			
Dar es Salaam	2.0	107	
Arusha	-7.2	36	***
Iringa	5.3	12	
Morogoro	5.1	29	
Mwanza	6.5	33	
Tanga	-5.6	19	*
Formal status			
Formal	-1.3	169	***
Informal	7.3	67	***

Note: T-test for differences in mean values between firms in the respective category and the rest of the sample firms. Significance levels: \*\*\* 1% level; \*\* 5% level; \* 10% level.

*Employment growth: A multivariate analysis*

In this section the results of a regression analysis explaining growth over the period 1990-1995 are briefly presented. The estimated model is explained in more detail in the annex.

The set of explanatory variables includes firm size in 1990 (or at the start for firms that started during 1990-1995) and firm age as basic determinants of firm growth. Additional explanatory variables that are expected to affect growth ( $X_i$  in the equation) include three sectoral variables and five locational variables. The informal status of the firm is captured by a binary variable equaling one if the firm is informal. The reference group are formal firms active in Dar es Salaam in the woodworking sector.

Table 6, first column, shows the estimated coefficients and standard errors for the growth regression.

**Table 6: Employment growth determinants 1990-1995**

Dependent variable: Average annual growth rate 1990-1995	All firms	Entrepreneurial firms
Log(empl90)	-0.148*** (0.023)	-0.193*** (0.033)
Log(empl90) **2	0.015*** (0.003)	0.021*** (0.005)
Log(firmage)	-0.040** (0.018)	-0.049** (0.021)
D-Informal	-0.126*** (0.032)	-0.147*** (0.037)
D-Food	-0.125*** (0.034)	-0.125*** (0.040)
D-Textiles	-0.017 (0.029)	-0.047 (0.035)
D-Metal	-0.040 (0.026)	-0.068** (0.031)
D-Arusha	-0.075** (0.030)	
D-Iringa	0.027 (0.049)	
D-Morogoro	-0.005 (0.034)	
D-Mwanza	0.045 (0.031)	
D-Tanga	-0.014 (0.039)	
D-Property		0.099** (0.040)
D-Technic		-0.023 (0.034)
D-Univ		0.087** (0.039)
D-Experience		0.010 (0.027)
D-Apprentice		0.023 (0.033)
D-Female		-0.002 (0.052)
Constant	0.409*** (0.060)	0.394*** (0.083)
Adj. R <sup>2</sup>	0.326	0.387
Observations	236	155

Note: Standard errors in parentheses; Significance levels: \*\*\* 1% level; \*\* 5% level; \* 10% level.

The relationship between size and growth is significantly negative, implying that smaller firms grow faster than larger ones. However, the squared employment variable included in the analysis is significant and positive, which implies a non-linear relationship that requires more investigation. The negative impact of initial size on growth is especially strong for the smallest firms and decreases with firm size.<sup>16</sup> This can be concluded from calculating the predicted growth rates for the smallest firms. On the basis of the coefficients and the sample mean values for the estimated equation, the predicted average employment creation rate for firms with an initial size of one, two, three, five and seven employed persons, is found to be 22.8 per cent, 13.3 per cent, 8.4 per cent, 2.9 per cent and –0.0 per cent. This shows how steeply the growth rates drop as micro firms move towards a slightly larger size. This supports the evidence found earlier, that micro firms, while growing strongly, see their growth performance flatten out quickly as they become a firm of about seven persons.

The regression results illustrate a typical growth path for firms in African manufacturing. Interestingly, the informal sector coefficient turns negative in the estimation. This indicates that the results found in the bi-variate analysis, that informal firms show higher growth rates, is due to the fact that informal firms tend to be micro or small firms. When controlling for size, informality in itself is found to be growth constraining, as it may render access to scarce inputs highly problematic. These findings are consistent with studies conducted in other countries, including studies based on RPED data (see further in the text).

Jointly these findings uncover a growth path of firms that can explain the persistence of a “missing middle” in the firm size distribution, typically observed in developing economies. As micro firms stagnate once they move into a slightly larger size and with the informal status additionally constraining small firms in their access to inputs, firms in the mid size range remain poorly represented.

In estimating the age effect, the quadratic term and the interaction term with size were found to be insignificant. Therefore, as the restriction of fixing their coefficient to zero could not be rejected, the model presented here only includes the logarithm of firm age. The negative age-growth relationship is also found in the data, suggesting that growth is essentially a learning process. The sectoral and locational variations found earlier are also reflected in the regression results.

#### *Growth of entrepreneurial firms: The impact of the owner characteristics on firm performance*

In the sample, 170 firms were entrepreneurial firms, defined here as firms owned by one or a few persons who at the same time manage and control the firm. Models of learning, discussed in the previous section, suggest that the performance of the firms be determined by the managerial endowments embodied in the entrepreneur. Persons with higher levels of entrepreneurial and organizational skills and managerial education would be more inclined to become entrepreneurs and are expected to run larger firms. Besides human capital, financial capital and the gender factor may play an important role in the post-entry growth of firms.

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<sup>16</sup> Estimated at the sample mean values, the critical size where the effect of size on growth turns positive is at 126 employees.

In what follows we first contrast the size and formal status of male and female run firms and of firms managed by entrepreneurs with different levels of education (table 7). Next we turn to an evaluation of their employment creation performance.

From table 7 it can be seen that in manufacturing the share of female entrepreneurs is very small. They also run especially micro and small firms and are over-represented in the informal sector. Female entrepreneurs are concentrated in the textile and clothing sectors (eight entrepreneurs) followed by woodworking (three entrepreneurs) and are, at least in the sample, absent in metalworking. Their educational level does not differ very much from that of the male entrepreneurs.

**Table 7: Distribution of entrepreneurial firms, by entrepreneur characteristics, firm size and formal status (numbers of firms and row and column percentages)**

	1-4	5-25	26-99	100+	Total	Informal	Formal
<b>GENDER</b>							
Male	48	71	32	7	158	48	110
	30.38	44.94	20.25	4.43		30.38	69.62
	90.57	92.21	96.97	100.00		90.57	94.02
Female	5	6	1	0	12	5	7
	41.67	50.00	8.33	0.00		41.67	58.33
	9.43	7.79	3.03	0.00		9.43	5.98
<b>APPRENTICESHIP</b>							
Apprentice	26	64	29	6	125	25	100
	20.80	51.20	23.20	4.80		20.00	80.00
	49.06	83.12	87.88	85.71		47.17	85.47
No apprentice	27	13	4	1	45	28	17
	60.00	28.89	8.89	2.22		62.22	37.78
	50.94	16.88	12.12	14.29		52.83	14.53
<b>EDUCATION</b>							
No education	3	4	2	0	9	4	5
	33.33	44.44	22.22	0.00		44.44	55.56
	5.66	5.19	6.06	0.00		7.55	4.27
Primary	33	32	6	3	74	38	36
	44.59	43.24	8.11	4.05		51.35	48.65
	62.26	41.56	18.18	42.86		71.70	30.77
Secondary	11	17	7	0	35	8	27
	31.43	48.57	20.00	0.00		22.86	77.14
	20.75	22.08	21.21	0.00		15.09	23.08
Techn./Vocat.	5	17	6	1	29	2	27
	17.24	58.62	20.69	3.45		6.90	93.10
	9.43	22.08	18.18	14.29		3.77	23.08
University	1	7	12	3	23	1	22
	4.35	30.43	52.17	13.04		4.35	95.65
	1.89	9.09	36.36	42.86		1.89	18.80
Total	53	77	33	7	170	53	117

Note: The data for this table correspond to the situation in 1993, when the round I interview was carried out.

Most of the entrepreneurs have been formerly apprentices, suggesting that apprenticeships are a common way to acquire skills and to get a taste for entrepreneurship. Entrepreneurs with an academic degree tend to run formal firms of medium and large size. The level of education also seems to be related to the choice for operating in the formal sector.

Employment creation/destruction over the period 1990-1995 for the entrepreneurial firms was subsequently looked at. Quite unexpectedly, no strong or significant differences could be observed from a bi-variate analysis. The analysis was done for the following variables: the gender dimension, formal education, whether the entrepreneur had been an apprentice, whether he/she had acquired experience in the industry previous to starting his/her business, whether his/her parents had been in business, his/her ethnic origin, whether he/she had received any training either from an NGO, the government, a donor or another firm.

The most interesting results were obtained from a regression analysis, in which growth is explained by firm size and age, formal status and industry, as in the previous section, but with six additional entrepreneur specific binary variables: for female entrepreneurs (D-female), for entrepreneurs with technical education or vocational training (D-technic), for entrepreneurs with academic education (D-univ), previous experience in the industry (D-experience) and former apprenticeships (D-apprentice), and a dummy variable for firms run by more wealthy entrepreneurs (property), i.e., entrepreneurs owning properties that could serve as collateral.<sup>17</sup> The results are reported in the second column of table 6.

Apparently, firms grow faster when entrepreneurs possess property that can serve as collateral when a loan has to be obtained. This finding provides supporting evidence that liquidity constraints are important for small entrepreneurial firms and determine their post-entry growth path. Other things equal, availability of assets on behalf of the entrepreneur raises the growth rate by 10 per cent. Also for the start-up of their firms, Tanzanian entrepreneurs had to rely heavily on their own financial resources (not in table). Only eight entrepreneurs had obtained a loan from a local or foreign bank to finance at least half the initial investment. One entrepreneur had received a credit from a supplier and one from a non-bank institution. All the other entrepreneurs had relied on own saving (110 entrepreneurs financed 100 per cent with own savings) and borrowed from friends and family (nine entrepreneurs financed 100 per cent in this way) or combined both sources. To finance the start up of their firm, eight women relied 100 per cent on their own savings, two combined their own savings with help from friends and family and one woman obtained a credit from a non-bank institution.

Entrepreneurs with an academic background are also more successful in generating additional employment, when compared to entrepreneurs with lower levels of education, i.e. no primary or secondary education. Technical and vocational training does not seem to prepare individuals for operations on a larger scale which require more managerial than technical capacities to overlook and coordinate the business. An apprenticeship or previously acquired experience in the industry do not

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<sup>17</sup> A house, a motor vehicle, a farm or a property other than the business or the house.

seem to enhance superior employment creation. The same holds for the gender dimension: no significant differences are observed for female-run firms.

*Constraints to growth and firm size: What keeps small firms from growing*

In the survey the interviewed person, manager or owner of the firm was asked to quantify a list of 16 factors on the degree to which they actually constitute an obstacle to the growth of their firm. The answers to the question were the respondents' subjective and personal view but complement the findings of the previous sections and contribute to a better understanding of how certain types of growth obstacles are related to firm characteristics.

The respondents quantified the severity of each of these 16 factors on a numeric scale ranging from 1 to 5, where 1 = no obstacle and 5 = severe obstacle. Table 8 shows the factors that had an average score of at least 2.<sup>18</sup> Additionally the managers and entrepreneurs were also asked to mention the most constraining factor. The last column of table 8 reports the number of managers/entrepreneurs that mentioned the respective factors as the major growth-constraining factor.

It can be seen that a lack of credit is perceived as the most constraining factor. Not surprisingly, access to credit seems most constraining to micro-firms, followed by small firms. Different types of business infrastructure seem to occupy the second up to the fifth place. Prices of utilities are more constraining to larger firms, who tend to have a more capital-intensive technology and make more intensive use of utilities. The opposite holds for the availability of premises, which is more problematic the smaller the firm.

Restrictions from the market, competition from imports and insufficient demand, only rank sixth and eighth. It is striking that in general, a scarcity of inputs, resources and support infrastructure are perceived as more constraining than market conditions.

**Table 8: Obstacles to growth, the perception of the owners or managers in 1993**

	All	1-4	5-25	26-99	100+	Formal	Informal	No.
1. Lack of credit	3.7	4.2	3.7	3.4	3.4	3.5	4.4	74
2. Price of utilities	2.9	2.2	2.9	3.2	4.1	3.2	2.0	16
3. Lack of business support services	2.6	2.7	2.5	2.6	2.7	2.6	2.6	20
4. Lack of infrastructure	2.5	2.5	2.3	2.6	2.7	2.6	2.4	21
5. Lack of premises	2.3	2.9	2.4	2.2	1.4	2.1	3.2	15
6. Competition from imports	2.2	1.6	2.0	2.5	3.4	2.5	1.4	15
7/8. Taxes	2.0	1.7	2.1	1.8	2.2	2.0	1.8	5
7/8. Lack of demand	2.0	2.1	2.2	1.9	1.6	2.0	2.1	9

Note: Number of observations = 215.

<sup>18</sup> The other factors with an average score of less than 2 are: ownership regulation, gaining investment benefits, government restrictions on activities, labour regulations, difficulty in obtaining licences, price controls, foreign exchange controls and location regulations.

#### 4. Comparison with other RPED studies

The RPED survey was also executed in several other sub-Saharan African countries, namely Burundi, Côte d'Ivoire, Ghana, Cameroon, Kenya, Tanzania, Zambia and Zimbabwe. Most of the analytical reports that were written after each data collection round pay specific attention to the performance of the sample firms in terms of employment growth. However, the way the firm growth analysis is done, differs in several aspects.

First, the periods over which growth is measured vary. Generally, in the reports written after the first data collection round, firm growth is studied over a longer period of approximately 9-12 years, from the beginning of the 1980s until the moment of the first round at the beginning of the 1990s. In the second round reports, which present the analysis of the data collected about one year after the first round, the growth of firms over a one-year period is shown. In general, the results for growth over one year seem to be subject to random and measurement errors and the impact of temporary shocks may be considerable. The more robust results are therefore generated when growth rates are averaged out over a longer period.

Second, the methodologies used for the growth analysis also differ between countries. Most studies start by presenting some average growth rates, for firms of different size, age and/or industry, as an introduction to a regression analysis of employment growth. As expected, the explanatory variables generally include initial firm size and firm age, either as categorical or continuous variables. Additionally, formal and legal status, ownership structure, sector of activity, location and whether the firm exports part of its output may be included in the analysis. In order to assess the impact of initial size on employment growth, some alternative methodologies used in the reports include presenting average and median growth rates and the evolution of employment by size class, using an index, which equals 100 at the beginning of the period under study.

Table 9 summarizes the growth analyses of the RPED reports, by presenting the applied methodology, the period over which growth is measured, the firm characteristics that were included in the analysis as determinants of firm growth, and the findings. When the regression analysis included variables that were found to be insignificant, these variables are also reported in the table in italics.

When investigating the size-growth relationship for the different countries, the results indicate that small firms grow faster than larger ones, a finding that is consistent with other studies. In Cameroon, the negative size-growth relationship is not significant, but one might suspect that the informal status is capturing some of the effects for the smallest firms.

Importantly, the results seem to indicate that the negative size-growth relationship is non-linear, similar to what is found for Tanzania. When a quadratic term of the initial size variable is included a positive significant coefficient is found, indicating that the very smallest firms grow faster, but their growth rate flattens out quickly as they become larger. This effect is found in the regression analysis done for Côte d'Ivoire, Burundi, and Zimbabwe. The average growth rates presented for the Cameroon firms also seem to support this idea: over the period 1992-93, only micro-firms grew positively while small firms contracted. For Kenya a U-shaped size-growth relationship is found. These findings provide evidence for a growth pattern that may be at the origin of the emergence of a "missing middle", with an

overwhelming amount of micro and small firms operating and stagnating at the margin of the economy and an under-representation of firms in the mid-size range. At the same time, and especially in Kenya, larger firms reap additional growth opportunities, reinforcing their strong position even further.

Table 10 presents the size mobility matrix for Burundi, Kenya, Cameroon, Ghana and Zimbabwe. It can be seen that the share of small firms that stagnate in their initial size class is very high, being 86 per cent, 92 per cent, 86 per cent and 70 per cent in Kenya, respectively Zimbabwe, Cameroon and Burundi. This indeed suggests that the negative size-growth relationship especially holds for the very smallest firms. The fraction of small firms that expands to a medium or large size is strikingly low and raises the question of what hampers small firms in the expansion of their activities (see next section). Most of the reports do not explore the scale where the impact of firm size becomes neutral or even turns positive, like in Kenya.

From the different survey reports, one can conclude that younger firms grow faster than older firms, supporting the idea that growth is essentially a learning process that takes place over time with a strong impact on firm size in the initial years of existence.

The impact of formality on employment dynamics has been analysed for the Burundian, Ivorian, Cameroonian and Kenyan sample firms. While for Burundi and Côte d'Ivoire the impact is found strongly positive and significant, it is insignificant for Kenya, and negative for Cameroon. However, different model specifications may be at the origin of the different results. In the light of the political weight given to the formalization process of small businesses in developing countries, its impact on employment growth should be analysed more thoroughly in combination with firm size and age.

Exporting firms grow faster and locational and sectoral differences of firm growth are often found.

The reports on Zimbabwe and Côte d'Ivoire have a section on firm growth in relation to owner specific variables. For both countries it was found that technical and vocational training facilitate the decision to start a firm, but seems to hamper growth later on. Higher levels of formal education, on the contrary, increase firm growth, gradually for Côte d'Ivoire, with diminishing return for Zimbabwe. The impact of acquired experience either by previously working in the same industry, through ageing or an apprenticeship is not clear or significant. In Zimbabwe female run firms grow significantly slower, the same is observed in Côte d'Ivoire, but the effect is not significant. In both countries, it seems that entrepreneurship and subsequent growth is hampered by a lack of financial resources.

This finding is also supported when one compares the obstacles to growth reported by the entrepreneurs, as summarized in table 11. Strikingly, lack of credit comes out as the most constraining factor in all the countries. It should be stressed that it is the entrepreneurs' subjective view that is reported here, and finance tends to be overemphasized. A lack of financial resources may result from other constraints, such as lack of managerial skills, the use of business finance for personal consumption, insufficient demand, etc. Yet the entrepreneurs will be more inclined to report lack of credit, rather than lack of personal skills. Insufficient demand and a lack of business infrastructure rank second and third. It is quite remarkable that a cross-country comparison reveals so little variation in what constrains small enterprise development.

**Table 9: Overview of analysis of employment growth for the RPED countries**

<i>R*</i>	<i>Type of growth analysis</i>	<i>Period of analysis</i>	<i>Firm characteristics</i>	<i>Findings</i>
<b>Burundi</b>				
1	Regression	Start-1986 1986-93 start-1993	Size Age Formal status <i>Foreign ownership</i> <i>State ownership</i>	- - +
	Size mobility matrix			
<b>Cameroon</b>				
1	Regression	1987-92	Age Formal status Producing import substitutes <i>Size</i> <i>Sector</i> <i>Exporting</i> <i>Access to credit</i>	- - +
2	Average growth rates	1992-93 1993-94	Size Sector	Over the period 1992-93, only micro-firms grow positively. In 1993-94, all firms, and especially medium sized, contract
<b>Côte d'Ivoire</b>				
1	Regression	1984-89 1989-94 start-94	Size Age Location Formal status Legal status <i>Sector</i> <i>Foreign ownership</i>	- - Firms in Abidjan grow faster + Corporations grow faster
<b>Ghana</b>				
1	Average growth rates	Start-1991 1988-91 1983-91	By size at start and end of period	Robust negative size-growth relationship
	Regression	Id.	Size <i>Age</i> <i>Exporting</i> <i>Professional management</i>	-
2	Regression	Start-1991 1988-91 1991-92	Size Age Sector	Micro firms grow faster Negative age-growth relation and sectoral differences for the period start-91.
<b>Kenya</b>				
1	Regression	1981-86 1986-93 1981-92	Size  Sector <i>Age</i> <i>Formal status</i> <i>Foreign ownership</i>	U-shaped size-growth relationship Sectoral differences
	Size mobility matrix			

2	Regression	1990-91 1991-92 1992-94 1990-94	Age Sector Size Formal status Foreign ownership	Negative age-growth relationship Sectoral differences
<b>Tanzania</b>				
1	Regression of employment growth and variability of growth	1984-93	Size Age Number of managers Entrepreneurs' education Asian entrepreneur	- - + + +  Variability of growth is negatively related to firm size
2				
3	Evolution of employment	1984-95	By size Sector Formal status Ownership structure	Sharp decrease of employment but some recovery in 1993-95 for micro, small and informal firms
<b>Zambia</b>				
<b>Zimbabwe</b>				
1	Regression	1981-86 1986-92	Size Age Location  Sector Exporting Foreign ownership	- - Firms in economic centre grow faster Sectoral differences + +
2	Regression  Evolution of employment on basis of mean and median growth rates	1991-94  1991-94	Size Exporting Sector Sector	- + Sectoral differences

\* The first column refers to the data collection round upon which the respective growth analyses are based: i.e. the growth analysis for Burundi is based on the data collected in the first and unique data collection round; for Cameroon, two data collection rounds were done, with a growth analysis on the respectively collected data.

**Table 10: Size mobility matrix: Percentage distribution of firms according to size in 1986/87 and size in 1993**

KENYA					
	Number of employees in 1993				
No. of empl. in 1986	1-9	10-49	50-99	100+	N
1-9	86	12	2	0	43
10-49	8	60	29	3	62
50-99	4	19	50	27	26
100+	0	0	13	87	31
ZIMBABWE					
	Number of employees in 1993				
No. of empl. in 1986	1-9	10-49	50-99	100+	N
1-9	92	4	4	0	24
10-49	5	67	15	12	33
50-99	0	14	59	27	22
100+	0	3	8	91	77
CAMEROON					
	Number of employees in 1993				
No. of empl. in 1987	1-9	10-49	50-99	100+	N
1-9	86	14	0	0	28
10-49	30	67	3	0	30
50-99	5	50	45	0	20
100+	3	8	16	73	37
BURUNDI					
	Number of employees in 1993				
No. of empl. in 1986	1-4	5-25	26-99	100+	N
1-4	70	27	3	0	30
5-25	7	70	16	7	30
26-99	0	0	79	21	14
100+	0	0	25	75	4

Source: RPED analytical reports and Biggs and Srivastava, 1996.

**Table 11: Major growth obstacles as perceived by entrepreneurs of micro and small firms**

	Main problem	2 <sup>nd</sup> problem	3 <sup>rd</sup> problem
Burundi	Lack of credit	Insufficient demand	Lack business support services
Côte d'Ivoire	Lack of credit	Lack business support services	Taxes
Cameroon	Lack of credit	Insufficient demand	Corruption
Ghana	Lack of credit	Insufficient demand	Cost of utilities
Kenya	Lack of credit	Insufficient demand	Lack of infrastructure
Zimbabwe	Lack of credit	Insufficient demand	Quality of infrastructure

Note: Micro and small firms are defined as follows: Burundi, Côte d'Ivoire: 1-25 employees, Kenya: informal firms, Cameroon and Ghana: 1-29 employees, Zimbabwe: 1-10.

Source: RPED survey reports.

## 5. Qualitative aspects of employment

The previous sections have looked into employment creation and destruction in different sub-groups of firms. However, as raised earlier in the text, too many studies focus on the quantitative aspect of employment creation without paying attention to the qualitative aspects of the jobs created. This section therefore explores some qualitative aspects of jobs in firms of different size and in formal versus informal firms.

The data for this section were collected during the first interview round in 1993 and basically they come from two sources:

- a) A first set of questions was addressed to the manager or entrepreneurs and asks, per category of workers, the wage level, mode and frequency of payment, whether or not allowances are paid to workers, degree of unionization of the work force, the degree of social protection, the cost of it to the firm, etc. The number of answers/observations for this type of question therefore corresponds to the number of firms in the sample.
- b) Additionally, in each firm a number (up to 20) of randomly selected workers, active in different functions, were interviewed as well. In the first round in Tanzania, 1048 workers were interviewed and asked to talk about their personal work history in the firm: starting wage, current wage, mode of payment, type of job at start and now, education, training, age, seniority, etc. The responses of the workers can be linked to the characteristics of the firms who employ them.

The following section combines the information obtained from both sources to shed some light on differential remuneration, job stability, social protection of workers, and human resource development in small versus large, and informal versus formal firms.

### *Remuneration*

Table 12 presents some statistics on different aspects of remuneration of workers. To allow inter-firm comparisons of wages, working hours, modes and frequency of payment, the first part of the table applies only to production workers, thereby controlling for worker characteristics that tend to affect these variables. The

second part of the table, presenting aspects of remuneration that are not overly related to worker characteristics, applies to all workers.

Table 12 presents the following remuneration indicators for the production workers:

- The average wage for production workers who are paid a time-rate salary. The average wage is calculated on the workers' responses and expressed on a monthly basis.
- The average weekly working hours for production workers, as reported by the manager, with a student T-test for differences in mean values between formal and informal firms
- The percentage of firms paying production workers a time-rate salary, a piece-rate salary or a salary in line with the firm's sales. The shares of firms paying the alternative modes of payment amount up to 100. A chi-square test is done to test whether there is a relation between firm size/formality and the mode of payment.<sup>19</sup>
- The percentage of firms paying food allowances, respectively housing, clothing, transportation allowances or bonuses. A chi-square test is done to test whether there is a relation between firm size/formality and the payment of either one of these allowances.

And applicable to the entire work force:

- The percentage of firms paying overtime work, public holidays and paid leave. A chi-square test is done to test whether there is a relation between firm size/formality and the payment of either one of these benefits.
- The percentage of firms reporting that at least one employee is a member of a labour union. A chi-square test is done to test whether there is a relation between firm size/formality and unionization.
- For those firms where there is at least one employee who is a member of a labour union, the fraction of unionized employees.
- The growth of the wage level since start, with a student T-test for differences in mean wage growth rates between formal and informal firms. All workers for whom the start and current wage are available are included, irrespective of their function.
- The share of workers who have in the past received a loan from the firm where they work, with a chi-square test for the relation between firm size/formality and access of credit to the workers.

It can be seen that controlling for the job type, wages do not differ significantly in firms of different size. They are slightly higher in formal firms, but the difference is not significant. This is a somewhat remarkable finding, that goes against the general observation that jobs in small enterprises are less remunerated (see Reinecke, 2001, p. 10).

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<sup>19</sup> The Chi-square statistic tests the null-hypothesis of no association between two variables. It involves the differences between observed frequencies in the sample  $n_{ij}$  and expected frequencies, i.e., frequencies under the hypothesis of no-association,  $m_{ij}$ . It is determined by:

$$X^2 = \sum_i \sum_j (n_{ij} - m_{ij})^2 / m_{ij}$$

Higher values of the  $X^2$  statistic lead to rejection of the null-hypothesis.

However, the base wage level is about the only aspect of remuneration that is not size or sector related. As can be seen from the rest of the table, the average weekly working hours, the mode of payment and the payment of allowances and benefits are significantly related to firm size and formal status. In larger and formal firms, production workers work less hours, receive more frequently a fixed time-rate-based salary and are paid allowances for food, housing, clothing and transportation. Moreover, workers in large firms enjoy more frequently paid holidays, overtime pay and paid leave and may benefit from a loan granted by the firm to overcome unforeseen expenses.

Regarding the mode of payment, it should be noted that in almost half of the micro and informal firms wages tend to depend on worker or firm performance, implying some degree of uncertainty about the eventual wage level. Regarding the frequency of payment, monthly payment of wages is most common in all size classes, yet in micro firms the category “other” may cover irregular payments, when liquidity is available to the entrepreneur.

Interestingly, the workers interviewed in micro firms and in informal firms seem to report a slightly stronger wage increase over the period they were employed by the firm. Since they started working there, their base wage grew yearly at an average rate of 2.7 and 3.3 per cent respectively. The difference is however not significant, but nevertheless it seems to indicate that the evolution of wages follows a pattern that compares to the underlying growth path of the firm that employs the workers.

**Table 12: Remuneration and firm size/formality, 1993**

	1-4	5-25	26-99	100+	Sign	Informal	Formal	Sign
<b>FOR PRODUCTION WORKERS</b>								
Average wage	10,502	9,078	12,757	13,173	-	10,400	11,097	0
Average weekly production workers working hours	51	46	45	44	-	52	45	***
Mode of payment: % of firms paying					***			***
Time rate	60	79	95	100		55	88	
Piece rate	24	15	5	0		30	8	
As % of firm sales	16	6	0	0		15	4	
Frequency of payment					***			***
Daily	21	7	5	4		27	5	
Weekly	0	5	0	0		0	3	
Fortnightly	0	7	5	0		0	5	
Monthly	61	76	88	96		58	82	
Other	18	5	2	0		15	5	
% of firms paying allowances								
Food	18	48	60	88	***	18	58	***
Housing	18	49	70	96	***	6	65	***
Clothing	16	44	67	92	***	12	59	***
Transportation	16	44	67	96	***	3	62	***
Bonuses	5	30	49	32	***	0	36	***
<b>FOR ALL WORKERS</b>								
% of firms paying								
Overtime pay	13	45	72	96	***	2	66	***
Paid leave	22	57	82	100	***	6	76	***
Paid public holiday	33	59	80	96	***	21	75	***
% of firms where unionization	12	35	64	96	***	0	57	***
% of unionized employees	78	91	93	97	-	n.a.	92	-
Wage growth	2.7	1.9	1.7	2.2	-	3.3	1.8	0
Loan	14	38	50	59	***	18	47	***

Note: Significance of either a T-test for differences in mean values or a Chi-square test for associations between variables. \*\*\* significant at the 1 per cent level; 0 not significant; - no test done; n.a. not applicable.

### *Job stability*

Table 13 contains a number of statistics that shed light on the degree of job stability. From the workers interviews, the average job tenure could be calculated. Average tenure, in table 13 expressed in months, increases with firm size, and is larger in formal than in informal firms (99 against 51 months).

In each interview round, the managers were also asked to describe employment changes over the last year. The absolute number of newly hired employees, laid-off employees, the number of employees that retired, absconded/quit, left because of illness or died, was recorded. This allows investigating employment flows that cannot be traced by a mere count of the number of persons employed. The latter can be constant, yet turnover within the firm may have been considerable. High labour force turnover is generally negative, not only for the firm but also for the workers. For firms, high labour force turnover implies high training costs to invest in newly hired employees in order for them to acquire firm specific skills needed to be productive. For employees on the other hand, high labour force turnover may imply relatively low job stability or job security.

Table 13 presents the findings for the years 1993, 1994 and 1995. This table suggests, in a rather speculative way, that labour force turnover and associated job stability is not very different in large versus small firms. The large share of laid-off workers in medium sized and large firms, especially in 1994 and 1995 may be due to the general trend of contraction which was also observed in the previous section. The share of workers that quit or abscond is not higher in small or micro firms. However, a lack of better opportunities in moments of economic downturn may be at the origin of this flat picture. Indeed, other studies mention that working in small enterprises is a kind of survival strategy adopted despite low returns, until something better comes along (Reinecke, 2001, p. 10).

It can also be seen that in larger firms the share of retired persons is higher, probably due to a higher average age of the workers in larger firms (see next section).

**Table 13: Tenure and labour force turnover, by firm size in 1993**

	1-4	5-25	26-99	100+
Av. tenure	72.1	96.2	87.1	113.1
1993	1-4	5-25	26-99	100+
% hired	12.6	8.4	5.6	7.1
% fired	4.0	2.4	23.0	6.3
% quit/absconded, retired, died	4.5	7.4	3.4	5.2
Net job creation	4.1	-1.4	-20.8	-4.4
1994	1-4	5-25	26-99	100+
% hired	4.6	4.4	3.2	6.0
% fired	0.6	5.4	125.8	19.2
% quit/absconded, retired, died	4.2	3.6	5.0	8.2
Net job creation	-0.2	-4.6	-127.6	-21.4
1995	1-4	5-25	26-99	100+
% hired	3.7	4.7	3.7	2.7
% fired	0.6	9.0	16.5	6.1
% quit/absconded, retired, died	5.5	4.4	4.6	8.3
Net job creation	-2.4	-8.7	-17.4	-11.7

### *Human resource development*

Table 14 presents some indicators of the level of general human capital employed by the firms. Human capital developed by formal education, ageing, and training are not only valuable to the firm that employs the workers. They also increase substantially the persons value in the labour market. In a way, job and firm specific skills acquired through job tenure (table 13) can also be considered as increasing human capital, but this firm specific human capital is mainly valuable to the firm that employs the worker.

It can be seen that the level of human capital increases with firm size and is higher in formal firms. Larger firms employ older workers and their work force has received more years of formal education. The fraction of workers trained inside or outside the firm is also larger.

**Table 14: HRD indicators and firm size and formality, 1993**

	1-4	5-25	26-99	100+	Sign	Informal	Formal	Sign
Average age	33.5	34.9	37.0	37.5	-	31.3	36.6	***
Average age when left school	17.1	17.5	18.6	21.2	-	16.8	18.9	***
% of workers that received training								
inside the firm	1.54	5.09	2.64	7.33	**	0.85	4.79	**
outside training	3.08	5.39	5.57	6.90	0	0.85	6.09	**

Note: \*\*\* significant at the 1% level; \*\* significant at the 5% level; 0 not significant.  
 - no test done.

### *Social protection*

Table 15 finally presents the fraction of firms that reported financing a number of social protection measures, with the significance of a chi-square test. It clearly comes out that workers in larger and in formal firms are socially more protected, as larger firms also provide, to a large extent, health care for family members. Income remains guaranteed when the worker is ill, and provisions for a pension fund protect his/her family from the consequences of old age. Moreover, about half of the larger firms finance education for the worker or his family, including the payment of school fees.

**Table 15: Social protection and firm size and formality, 1993**

	1-4	5-25	26-99	100+	Sign	Informal	Formal	Sign
% of firms paying								
Health care	25	54	82	100	***	15	73	***
Health care for family	12	37	48	78	***	4	49	***
Education for worker or family	4	12	20	54	***	2	22	***
Sick leave	24	52	68	100	***	8	69	***
Pension fund	15	54	78	93	***	2	71	***

Note: \*\*\* significant at the 1% level.

In sum, the analysis of the qualitative aspect of employment reveals that jobs offered by larger firms are not necessarily better remunerated when base wages are compared. However, many indications show that working in larger formal firms is far more beneficial to the worker and his family. The number of working hours are less, while chances to earn benefits and allowances are greater. The earned wage and the job itself is more secure, the perspectives for human capital development are better, and social protection of the worker and his family are clearly superior in larger firms, compared to what small firms can offer. This may be due to the fact that unionization in larger and formal firms is clearly stronger.

## 6. Conclusion

When analysing employment growth, one determinant that comes out strongly and in a robust way is the initial size of the firm. Micro and small firms are found to grow faster, yet variability is also high. This means that the failure rate of small firms is quite high, but in those firms who survive, perspectives for employment generation are positive. Among the surviving firms, micro firms are growing faster, not only in Tanzania but elsewhere in Africa.

While this is a hopeful sign, the under-representation of medium-sized firms remains puzzling. Indeed, while transition from micro firms to a slightly larger size is quite common, firms seem to stagnate somewhere in the 5-25 employed persons size-range, a typical feature in African manufacturing. The missing middle range in the size distribution of firms observed in many African countries is the result of a business environment that imposes certain obstacles to the growth of small firms (Sleuwaegen, Goedhuys, 2002). When the entrepreneurs speak about their own firms, in addition to a weak demand for their product — which is inherent to the low purchasing power of their clients and common to all firms — a lack of credit, infrastructure, and business support services seems to be at the origin of the stagnation. Strikingly, most studies tend to uncover a lack of inputs as constraining enterprise development. However, it seems to affect firms of different size and formal status in a different way.

In their competition for resources, informal and small firms find themselves in a disadvantaged position compared to formal or larger competitors. Formality facilitates access to inputs, improves a firm's legitimacy in the industry, creates a reputation of trustworthiness in the eyes of clients and suppliers, and makes the firm less prone to corruption and harassment by police. However, evidence from Tanzania shows that barriers to entry into the formal sector are very high. An experiment in which 12 businesses were registered, revealed that registering is a highly costly and frustrating process, with no guarantee of success. This barrier is probably at the origin of the duality in African economies observed, as small firms do not have the scale to overcome the cost of entry into the formal sector and are forced to remain small with little visibility.

The consequences of this duality are fargoing. Economies of scale that exist in most industries remain largely unexploited, with resultingly low levels of profitability and investment, in turn leading to low labour productivity and low wages. The quality of employment is also related to size and formality. In large and formal firms, job and social security, remuneration and human resource development are clearly superior.

From a policy perspective, the findings suggest that firms located in the small size class, challenged to becoming a formal enterprise seem to have superior employment creation potential. Entrepreneurs with some higher level of formal education appear to be able to create additional employment, and to manage operations on a larger scale. At the same time, efforts should be oriented toward

decreasing the barrier posed by the formal registration procedure. The cost of gaining information about registration and the process of registering are unnecessarily high.<sup>20</sup>

Ideally, an analysis should be done with a data set that includes information on entry and exit of firms, besides surviving firms, in order to correct any bias originating from the sample selection. Another interesting extension of the research would be to compare the findings with growth of firm in developing countries in other continents. An analysis of different countries also allows relating firm performance to macro-economic conditions and policy variables.

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<sup>20</sup> This is not to say that in the given circumstances all firms should be forced to register, rather the opposite, that registration should be made transparent and simple so that a cost/benefits analysis done by entrepreneurs would stimulate them to register.

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## Annex

In line with previous work on firm growth (Evans, 1987a and 1987b; Variyam and Kraybill, 1992, Audretsch et al., 1999, Sleuwaegen and Goedhuys, 2002 among others) the basic empirical model follows a general growth function  $G$ , in firm size and firm age. Hence, the firm growth rate can be expressed by the following equation :

$$S_{t'}/S_t = (G(S_t, A_{t'}))^d \quad (1)$$

where  $S_{t'}$  and  $S_t$  are the size of a firm in period  $t'$  and in period  $t$  respectively,  $G$  is a general growth function,  $A_{t'}$  is the age of the firm in period  $t'$ ,  $d$  refers to the period over which growth is measured, or  $d = t' - t$ . Taking the logarithm of both sides yields:

$$X = \frac{\log(S_{t'}) - \log(S_t)}{d} = \log G(A_{t'}, S_t) \quad (2)$$

Approximating the growth function  $G$  by taking a second-order expansion (Taylor approximation) and allowing for a vector of firm specific variables  $X$  that are hypothesised to affect growth, the average annual growth rates are explained by the following equation:

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

where  $a$  and  $b$  are coefficient vectors.

If  $d$  refers to the number of years over which growth is measured, the dependent variable in this last equation corresponds to an average annual growth rate. The impact of initial firm size and firm age on subsequent growth can be analysed by calculating the respective partial derivatives (as explained by Evans, 1987a and 1987b; Variyam and Kraybill, 1992). The partial derivatives  $g_s = (d \ln G / d \ln S)$  and  $g_a = (d \ln G / d \ln A)$  allow to test for alternative theories of firm growth. Gibrat's law implies that the partial derivative  $g_s$  equals zero, or, there is no significant relationship between firm size and subsequent growth. Alternatively, a negative relationship between firm size and growth, which is found in many empirical studies, implies that  $g_s < 0$ . Models of learning suggest that growth slows down as the firm ages, or  $g_a < 0$ .

In line with this model, the dependent variable is the average annual employment growth rate calculated by the logarithm of employment in 1995 (end size) minus the logarithm of employment in 1990 (beginning-of-period size), divided by 5. For firms that started during that period the start size is taken and the period of measurement is adjusted accordingly. In a similar way, explanatory variables include

beginning-of-period size and firm age, in logarithmic terms, their quadratic terms and the interaction term of both variables.

As explained in section 2, a number of firm and/or entrepreneur characteristics is hypothesized to affect firm growth. Access to financial and human capital, the formal status of the firm, its location and sector of activity may have a significant impact on the performance of firms. Hence, these variables were selected and included in the estimation as binary variables.

The impact of multicollinearity on the results was tested. The estimated coefficients appeared to be robust, in magnitude and sign, when estimating different models including different subsets of explanatory variables.<sup>21</sup> Tolerance values were calculated and they indicate that the findings are robust and not the result of multicollinearity of the explanatory variables.

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<sup>21</sup> These estimated models can be obtained from the author upon request.

## SEED Working Papers

1. “Home Work in Selected Latin American Countries: A Comparative Overview” (*Series on Homeworkers in the Global Economy*), Manuela Tomei, 2000
2. “Homeworkers in Paraguay” (*Series on Homeworkers in the Global Economy*), María Victoria Heikel, 2000
3. “Homeworkers in Peru” (*Series on Homeworkers in the Global Economy*), Francisco Verdera, 2000
4. “Job Quality and Small Enterprise Development” (*Series on Job Quality in Micro and Small Enterprise Development*), 1999
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