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Growth Dynamics of Young Small Firms:

Evidence from Tunisia

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ABSTRACT

The aim of this paper is to investigate the growth dynamics of young small firms (in contrast with larger and older incumbents) in a developing country context, using a unique and comprehensive dataset of non-agricultural Tunisian companies. Our results suggest that significant differences between young and mature firms can be found as far as the drivers of their growth are concerned. The key finding being that - while consistently with the extant literature Gibrat's law is overall rejected - the negative impact of the initial size is significantly larger for young than mature firms. This result has interesting policy implications: since smaller young firms are particularly conducive to employment generation, they can be considered good candidate for targeted accompanying policies addressed to sustain their post-entry growth.

Key words: firm's growth, young firms, Gibrat's law, Tunisia.

JEL codes: O12, L26

1 Introduction

The determinants of the growth of new entrants, young and small firms' have received increasing attention in the last decades, due to their obvious economic and employment impact. Indeed, since Birch's seminal contribution, small firms have been considered as the main driver of net job creation (Birch, 1987). While Davis *et al.* (1996) contented that this result was based on major empirical drawbacks, Neumark *et al.* (2011) showed that actually small firms do create more jobs than the large ones, and that this result holds both for firms in manufacturing and service sectors.

More recently, both the academic community and the policy makers have shown increased awareness of the role of young companies in the renewal of the industrial structure and ultimately in fostering economic growth and job creation (see Schneider and Veugelers, 2010; Pellegrino *et al*., 2012; García-Quevedo *et al.*, 2014). From a theoretical point of view, the basis of this policy focus is the Schumpeterian 'creative destruction' hypothesis (Schumpeter, 1912 and 1934;) according to which newly established firms are more prone to innovation and job-creation rather than their mature counterparts (Schumpeter, 1912 and 1942). In this 'entrepreneurial regime' young firms are the main factors of change, and policy makers should focus on them rather than on larger and older incumbents (for the distinction between an entrepreneurial regime and a routinized one, see Winter, 1984; Malerba and Orsenigo, 1996; Breschi et al., 2000).

Given the key role of young firms in fostering economic growth and employment generation, the understanding of the mechanisms behind their growth patterns is crucial to provide support to policies aiming at promoting economic development in both developed and developing countries. In particular, the research questions investigated in this paper focus on the growth dynamics of young small firms (in contrast with larger and older incumbents) in a developing country context, using a unique and comprehensive dataset of non-agricultural Tunisian companies.

Most of the extant empirical investigations on the subject have been conducted within a Gibrat's law framework (Gibrat, 1931), testing the relationship between size and firms' growth, and controlling for a number of other explanatory variables at the firm and institutional level. The bulk of these studies have focused on developed countries, generally yielding econometric results supporting the rejection of Gibrat's law and showing than

smaller and young firms grow more than larger and older companies (see the literature discussed in the next section).

As far as Gibrat's law is concerned, the evidence about developing countries is much more scant, and mostly based on small samples of firms (Nichter and Goldmark, 2009; Vivarelli, 2013; Quatraro and Vivarelli, 2015). This paper aims to fill this gap in the literature and to directly test whether the inverse correlation between initial size and firm's growth is confirmed in the Tunisian context and - more importantly - whether the rejection of the law is more obvious for young firms (in taking young firms and not start-ups, we exclude "revolving door" companies entering the market and exiting it in a while, see Santarelli and Vivarelli, 2007; Vivarelli, 2013). If such would be the case, policy makers should be advised about the difference between young and mature firms and they should design targeted accompanying policies, addressed to the fast-growing small and young companies. In this respect, to be small and young might be considered a source of priority in terms of receiving public supports devoted to job-creation.

Together with this key issue, the empirical study here provided will also investigate other circumstances that may differently affect employment growth in young rather than older firms. For instance, the positive correlation between output and growth is equally important and significant in young companies and in the incumbents? Within the subsamples of the young and mature firms is the inverse relationship between age and employment growth (see above and next section) equally confirmed? Are other circumstances such as foreign ownership, geographical location and sectoral belonging equally affecting employment growth in young firms compared with mature companies? Obviously enough, if we will find some significant differences, policy makers should shape their interventions taking into account them.

Therefore, this paper adds to the extant literature in many respects. Firstly, we provide a systematic test of the possible differences between young and mature firms, whereas the previous empirical literature does not directly address this dimension, usually relying on firms' age just as a control variable. Secondly, we adopt a very large dataset (almost 340.000 companies) to implement our microeconometric model, while previous studies focusing on developing countries were based on far smaller and less representativefirm-level databases. Thirdly, by focusing on firms having survived to the turbulence period, we can provide robust policy implications in terms of the job-creation capacity of incumbents *vs* young (but solid)

companies. Finally, to the best of our knowledge, no previous studies can be found - in the literature relevant to the investigated subject - focusing on the Tunisian context.

The rest of the paper is organized as it follows. Section 2 discusses the pertinent literature, while in Section 3 we present the empirical context, also discussing the main features of the Tunisian economy in the observed period. In Section 4 we introduce the data, we provide some descriptive statistics and we put forward the econometric specification. Section 5 presents the empirical results, while Section 6 briefly provides concluding remarks and some policy implications.

2 The literature

Empirical analyses of the drivers of firms' growth are mostly grounded on the Gibrat's Law of Proportionate Effect (cf. Santarelli, Klomp and Thurik, 2006). This was put forward by Robert Gibrat (1931), and states that a firm's growth path is independent of its size at the beginning of the period examined. In other words, according to Gibrat's law, the initial size of the firm is not a predictor of its growth rate. The fortune of Gibrat's law was due to the fact that its prediction was consistent with the observed (lognormal) firms' size distribution across different sectors, while from a theoretical viewpoint, it was in line with classic economic models of firm size distribution, like the one by Viner (1932) and Lucas (1978) (see Lotti, Santarelli and Vivarelli, 2013, for a discussion).

In contrast, a vast number of studies have found (conditional on survival), a negative relationship between start-up size and post-entry growth, thus rejecting Gibrat's Law (see Hall, 1987; Hart and Oulton, 1996; Sutton, 1997; Lotti, Santarelli and Vivarelli, 2003 and 2009). This evidence means that smaller new entrants with a sub-optimal entry size and with a higher risk of early failure must grow in order to survive and reach the "minimum efficient scale" (MES) as soon as possible. However, once market selection is accounted for, long run analyses have instead shown that a convergence towards Gibrat-like behavior can be detected among the survived most efficient firms (see Lotti, Santarelli and Vivarelli, 2006 and 2009; Daunfeldt and Elert, 2013). In other words, once small entrants have succeeded in approaching an efficient scale of production, their growth dynamics resembles more and more a stochastic process in which size and growth are independent.

Consistently, firm's age turns out to be positively correlated with survival (that is the hazard rate is decreasing with age; see Fackler, Schnabel and Wagner, 2013) and negatively with growth (see Evans, 1987; Dunne and Hughes, 1994; Calvo 2006; Coad, Segarra and Teurel, 2013): experienced, mature firms are more able to deal with market dynamics and so more likely to stay in the market; however, once they have reached (or being very close to) the MES, they do not need to grow very fast.

While all the studies cited so far concern developed countries, the evidence from DCs is similar. For instance, Das (1995), dealing with the Indian computer industry, found a significant negative relationship between firm growth and initial firm size; McPherson (1996), in a study on five southern African countries, detected a significant negative link between firm growth and both firm's size and age; Goedhuys and Sleuwaegen (2000) and Sleuwaegen, and Goedhuys (2002), respectively analyzing 141 and 129 manufacturing firms in Côte d'Ivoire, also found negative correlations between firm growth and both firm size and age; finally, running GMM-SYS panel estimates covering census-based Ethiopian manufacturing firms over the period 1996-2003, Bigsten and Gebreeyesus (2007) showed how the negative relationship between size and age on the one hand and firms' employment growth on the other is significant and robust to sample selection and unobserved firm heterogeneity.

Nichter and Goldmark (2009) provides a meta-analysis of the determinants of small firms' growth, comparing developing and developed countries. Besides the important role of initial size and age, they also point to the relevance of the characteristics of the individual entrepreneur (see also Amoroso, Audretsch and Link 2018), as well as of firm level characteristics, and other contextual factors (see also Emami and Dimov, 2017, using Iranian microdata).

More recent literature has confirmed that firms' age may play a crucial role in shaping the relationship between size and firms' growth. In particular, Haltiwanger, Jarmin and Miranda (2013) - using data from the US Census Bureau's Business Dynamics Statistics and Longitudinal Business Database - show that, once one controlled for firm age, the negative relationship between size and growth either disappears or reverses the sign, due to the large share of exit among the smallest firms. However, as far as age is concerned, young firms are found to grow more rapidly than the mature ones (for a recent analysis of the link between age and firm's performance, see also Coad, Segarra and Teruel, 2013).

While previous literature has singled out the important role of age in affecting firm's growth and the departure from the Gibrat's law, a gap in the literature regards the in-depth understanding of the role of age in assessing the impact of the different drivers of firms' growth. The missing link being to what extent firm-level characteristics may have a differential impact on the employment growth rates of young *vis-à-vis* mature firms.

In more detail, in what follow we test the hypothesis that young firms (being in their early stage of company's life cycle and still rushing to the MES) should be more sensitive to initial size, age, output dynamics and other firm specific characteristics - such as foreign ownership, location and sectoral belonging - in comparison with their more experienced and larger counterparts.

3 The context

Since its independence in 1956, Tunisia has undergone diverse political, social and economic phases. The first stage of collectivism eventually failed to deliver its promises, paving the way to a new course in the 1970s, featured by import substitution and export promotion. However, in the 1980s Tunisia has been characterized by a slowdown of productivity growth, due to economic mismanagement and political instability (Ayadi and Mattoussi, 2016a).

Since the 1990s, the country has experienced liberalization policies that have encouraged foreign investments, accelerated privatization and deepened integration in the European market (UNIDO, 2001). In the 2000s a marked growth of GDP has been observed, driven on the one hand by the consolidation of FDIs and exports, and on the other hand by a change in the national economic structure featured by the emergence of service sectors and of new sectors of specialization like electronics and automotive components.

In particular, export of goods and services has grown at the average rate of 8.5% in the period 2002-2006. Currently, the European Union represents more than 70% of Tunisian exports and accounts for half of the imports. This has led to important productivity gains and emergence of innovative behaviors (Ayadi and Mattoussi, 2016b).

Despite the positive performances of the Tunisian economy in the 2000s, the uneven distribution of wealth exacerbated social conflicts due to income inequalities and youth unemployment growth. Unemployment hovered between 16 and 14% per annum between 1996 and 2010. This eventually led to the Arab Spring and the fall of the regime.

With a structurally high unemployment rate of around 15%, Tunisia currently faces the problem of 620 thousands unemployed including 260 thousands graduates. A continued supply of 60 thousand new graduates and 100 thousand school dropouts are registered every year. Due to the slow economic growth and the extremely limited mobility of job offers, some unemployed workers turn into discouraged workers.

Job creation remains therefore a crucial issue in the political agenda of the Tunisian government. In this context, understanding the drivers of growth of small and young firms is of paramount importance, in view of the role that these actors play in net job creation, as stressed in Sections 1 and 2. The evidence is consistent with this view: Table 1 shows the contribution to net job creation, by firms' size and age class (over the period considered in this study)

>>> INSERT TABLE 1 ABOUT HERE <<<

The evidence shows that micro, small and medium sized enterprises are especially responsible of net job creation in very young firms. The importance of this kind of firms decreases, as firms get older. When mature firms are considered , net job creation is definitely driven by large firms. In what follows we will therefore provide an assessment of the differential drivers of small firms' growth in young vis-à-vis mature firms. The next section provides details on the data we used and the implemented methodology.

4 Data, Variables and Methodology

4.1 Data

The main dataset used for this paper is the Tunisian registry of firms (the Répertoire National des Entreprises - RNE - for the period 1996–2010) collected by the Tunisian Institut National de la Statistique (INS). The RNE draws on information from a host of constituent

administrative databases including the social security fund (Caisse Nationale de la Sécurité Sociale — CNSS) which is the source for the employment data, as well as datasets from Tunisian Customs, the Tunisian Ministry of Finance, and the Tunisian Investment Promotion Agency (l'Agence de Promotion de l'Industrie et de l'Innovation — APII), containing data on all firms registered with the tax authorities (see INS, 2012, for detailed information on its construction). This database comprises information on *inter alia* the employment, age and main activity of all registered private non-agricultural firms, except cooperatives. A major and unique advantage of the Répertoire is that it has no lower bound in terms of size and records information on firms without paid employees, *i.e.* the registered self-employed, which account for a vast portion of Tunisian enterprises. This renders it feasible to examine the dynamics of these firms, which are often not covered by firm censuses, and to assess their contribution to aggregate net job creation, which we will see to be very important.

Some features and limitations of the data have to be borne in mind when interpreting the results. Firstly, the Répertoire only provides information on registered employment. Consequently, it does not document informal employment, which is substantial in Tunisia as in any developing country. Therefore, the employment numbers (and flows) in our data are likely to be biased downwards both due to under-reporting of labor by registered firms and because many firms may not register at all. Secondly, the superior coverage of self-employment in our data compared to wage employment suggests that our estimates of the skewness of the size distribution may likely result to be exaggerated. Thirdly, microenterprises that register may be more successful than the ones that choose to remain informal, which may bias our recorded employment growth of small firms upwards. Fourthly, our database is at the company level and not at the establishment level; we thus do not observe job-reallocation due to plant openings or closings.

4.2 Variables and descriptive statistics

In line with the key research question characterizing this study, the dependent variable used in the empirical estimations is the growth rates of employment for each firm. There are indeed different alternatives to the measurement of firms' growth rates, including the use of total assets, sales, value added or employment. This latter has many advantages, as employment statistics do not need to be deflated and do not suffer from measurement errors, thus allowing cross sector comparisons. Moreover, using sales one risks to overestimate

growth, as they reflect not only value added but also input prices. In addition, since we deal with small and young firms, the employment measurement of growth is robust to manipulation of reported sales, value added and profits (Coad and Hölzl, 2011). Last but not least, job creation is the research focus of this study and so to measure firm's growth in terms of employment is a natural choice.

As far as the used time span is concerned, we decided to focus on the more recent years within our dataset covering 1996-2010. In fact – given the features of the sourcing databases and the way how they have been built over time - this choice allowed us to have access to a larger and more reliable sample. However, we also decided to take 2007 as end-period in order to rule out any concurring effect and bias related to the global economic crisis occurred in 2008 and following domestic turmoil period

Therefore, we have focused on firms that were active in 2007, and that had successfully survived through the typical 5-year turbulence period of the entrepreneurial life cycle (see Sutton 1997; Audretsch, Santarelli and Vivarelli, 1999; Vivarelli, 2013). Therefore, we select a subsample of firms aged at least 5 years in 2007. In order to cope with the intrinsic volatility of growth statistics, we use as a dependent variable the average growth rates of employment over the period 2003-2007. Let X_{it} be the employment levels of firm i at time t, the dependent variable is calculated as it follows:

$$g_{i,0307} = \frac{1}{5}\ln\left(\frac{X_{i,2007}}{X_{i,2003}}\right) \quad (1)$$

As far the explanatory variables are concerned, we include in the analysis the logarithm of firms' employment level at 2003: $EMPL_{i,03} = ln(X_{i,2003})$; the growth of firm's sales over the period 2003-2007 ($SALES_{i,0307}$); firms' age in 2007 (AGE_i) and a dummy controlling for foreign ownership ($FOREIGN_i$). Indeed, FDI companies may exhibit better growth performances due to their advantages in both market and technology in comparison with domestic firms (see Feenstra and Hanson, 1997; Blomström and Kokko, 1998; Edwards, 2004; Meschi and Vivarelli, 2009).

Table 2 shows the descriptive statistics for the variables used in the econometric analysis.

>>> INSERT TABLE 2 ABOUT HERE <<<

Figure 1 shows instead the kernel density distribution for the dependent variable.

>>> INSERT FIGURE 1 ABOUT HERE <<<

Both Table 2 and Figure 1 show evidence for the whole sample of firms, and for the subsamples concerning mature and young firms. The latter are defined as young if they are aged at most ten years, while firms are regarded as mature if they are more than ten years old. As can be seen, young firms turn out to be smaller, but fast growing (mean of $g_{i,0307}$ equal to 0.071) in comparison with their larger counterparts (mean $g_{i,0307}$ equal to 0.022): this preliminary evidence is consistent with what discussed so far.

Finally, Table 3 reports the sectoral distribution of our sample: not surprisingly, traditional services, construction and textile emerge as dominant.

>>> INSERT TABLE 3 ABOUT HERE <<<

4.3 Methodology

As discussed above, the purpose of this paper is to investigate the drivers of firms' growth in Tunisia, and to test whether any relevant difference can be found between young and mature firms. In this direction, the proposed specification extends the traditional empirical framework to test Gibrat's law:

$$g_{i,0307} = \beta_0 + \beta_1 EMPL_{i,03} + \beta_2 SALES_{i,0307} + \beta_3 AGE_{i,07} + \beta_4 FOREIGN_i + \sum_{r=1}^{R} \gamma_r D_r + \sum_{s=1}^{S} \varphi_s D_s + \varepsilon_i \quad (2)$$

where D_r and D_s are regional and sectoral dummies respectively and the main regressors have been defined in the previous Section 4.2. Given the available data for the variables used, specification (2) has been tested using 147,342 firm level observations.

Specification (2) can be tested by implementing an OLS estimation, with heteroscedasticity-robust standard errors. However, a strand of literature has stressed that firms' growth rates are likely to feature a Laplace distribution (Bottazzi and Secchi, 2003; Bottazzi et al. 2007; Bottazzi and Secchi 2006; Castaldi and Dosi 2009), therefore suggesting to adopt quantile regression techniques (Coad, 2009). In the following Section 5, both the methodologies will be used.

Before proceeding to discuss the results of our econometric estimations, we present in Table 4 the matrix showing the correlation coefficients amongst the variables included in the analyses. In the first panel of the table we show the correlation coefficients obtained from the full sample, while in the mid and the bottom panels we show correlation coefficients obtained for the subsamples of young and mature firms respectively.

>>> INSERT TABLE 4 ABOUT HERE <<<

As can be seen, the correlation coefficients among all of the variables are in most cases statistically significant, and - when significant - showing the expected signs with regard to the dependent variable. Nevertheless, the magnitude of these coefficients is so low that does not generate any concern about possible multicollinearity issues. However - to be on the safer side - we calculated the variance inflation factor (VIF) for the focal variables of our analysis. All the computed values (available upon request) are below 1.04 and so clearly below the threshold value of 5, which is used as a rule-of-thumb to discriminate situations in which there might be a problem of multicollinearity among the explanatory variables.

5 Econometric results

The results of the OLS estimations of equation (2) are reported in Table 5. The first column of the table shows the coefficient obtained by running the regression over the full sample. Columns (2) and (3) show instead the coefficient obtained from the subsamples of young and mature firms respectively. Finally, the last column reports the test of the statistical significance of the difference between the coefficients for young and mature firms.

>>> INSERT TABLE 5 ABOUT HERE <<<

The first coefficient of interest is β_1, i.e. the coefficient of *EMPL*. The coefficient is negative and significant both for the full sample, and for young and mature firms. Therefore - in line with the previous literature (see Sections 1 and 2) - Gibrat's law is largely rejected. However, the magnitude of the negative impact of initial size differs between young and mature firms, the former being more affected than the latter. In other words, on the whole small firms are the most dynamics in terms of employment growth rates, but this small firms'

dynamism is more pronounced for young than for old firms. Small and young firms seem therefore to represent the engine of economic vitality in Tunisia.

For what concerns the other drivers of growth, not surprisingly the coefficient of *SALES* is positive and significant both for the full sample, and for the two subsamples of young and mature firms. The magnitude of the coefficient is almost the same in all of the three cases, so that no significant differences can be found between young and mature firms.

The evidence about the impact of AGE on firms' employment growth rates is quite interesting. In fact, the coefficient of this variable is negative and significant in line with the previous literature (see Section 2). This implies that younger firms feature on average higher growth rates. However, when we separate out young from mature firms, we find that the variable is only significant within the subset of young firms, with the expected negative sign, but it is not significant for mature firms. AGE matters, and in particular very young firms seem to be those characterized by the most promising economic performances.

Also the FOREIGN dummy shows the expected positive and significant coefficient in the first column of the table, indicating that foreign ownership is associated to higher growth rates. However, also in this case, we find that the evidence holds only for young firms, while the coefficient of this variable for mature firms is not statistically significant.

A look at regional and sectoral dummies reveal that firms with higher growth rates tend to concentrate in a few areas, like Tunis and Ariana, and in a good number of sectors. With regard to the latter, sectoral belonging seems to play a more crucial role in younger firms.

The results of the OLS estimations provide an overall picture of the drivers of firms' employment growth rates in Tunisia, and highlight interesting differences between young and mature firms. However, we have already stressed how the distribution of firms' growth rates is usually more similar to a Laplace than a Gaussian distribution (see Figure 1 and Section 4.3). In this case quantile regression techniques allow to get a richer description of the empirical evidence. As a robustness check, the results of quantile regressions are reported in the Table 6 below.

>>> INSERT TABLE 6 ABOUT HERE <<<

The table comprises three panels, showing the results obtained at three different quantiles of the distribution, i.e. 0.25 (top panel), 0.5 (mid panel) and 0.75 (bottom panel).

For what concerns the effect of our key variable EMPL, one can notice that the coefficient is negative and significant both for the full sample and for the subsets of young and mature firms, only when one looks at firms in the uppermost quantile of the distribution. Firms at the median of the distribution feature a negative and significant coefficient only as far as young firms are concerned, while for the full sample and for mature firms the variable is not significant. Conversely, for firms in the lowermost quantile, EMPL shows a significant coefficient only for the full sample and for mature firms, though the sign is positive, while it is not significant for young firms.

Gibrat's law is therefore always rejected for high-growth firms, while the picture is less regular for the other firms. For firms in the lowermost quantile the relationship between initial size and firms' growth rates is even reversed. The impact of EMPL is therefore clearly nonlinear. Moreover, our key result in Table 6 seems to be driven by firms experiencing average growth rates, while the difference between young and older firms fades away when fast growing companies are considered.

6 Conclusions and policy implications

As shown in Section 4.2, the contribution of small young firms in generating employment across the different Tunisian manufacturing and services industries has been substantial in the period investigated in this study.

However - and consistently with the hypothesis put forward at the end of Section 2 - the outcomes of our econometric estimations discussed in the previous section suggest that significant differences between young and mature firms can be found as far as the drivers of firm's growth are concerned.

Firstly, and consistently with the extant literature (see Section 2) Gibrat's law is overall rejected; however, the negative impact of the initial size is significantly larger for young than mature firms. This result may have interesting policy implications: since smaller young firms are particularly conducive to employment generation, they can be considered

good candidate for targeted accompanying policies addressed to sustain their post-entry growth, for instance in terms of relaxing financial constraints and/or providing advises for the improvement of their organizational and managerial practices.

Secondly, age has a negative and significant impact on employment growth. While this result is highly consistent with the previous studies (see Section 2), what we find is that this impact is much larger within young firms, revealing again a substantial heterogeneity in the employment growth patterns. This means that *very young* and small firms are more likely to generate employment and this should be taken into account by policy makers.

Thirdly and in contrast with our general hypothesis, our estimates show that sales dynamism affects employment growth in both young and mature firms. An implication of this outcome is that Keynesian demand-side policies do not require to be tailored for young small firms.

Fourthly, in our estimates foreign ownership turns out to be positive and significant only for young firms; this means that foreign participation is a key asset in fostering the growth of young small firms, while it becomes less crucial once the companies are getting older and better established in their markets. Obviously enough, this outcome calls for an economic policy oriented to facilitate green-field FDI in the Tunisian economy.

Finally, regional and sectoral dummies are sometimes significant, particularly when young firms are singled out; not surprisingly, young unexperienced small firms reveal to be more sensitive to their regional and sectoral belonging, in comparison with their larger and more established counterparts.

Overall, these results suggest that young and mature firms are very different animals; with the exception of demand policies that can be thought as *erga omnes*, policy makers should take into account this heterogeneity and bearing in mind that small young firms require customized measures.

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Figure 1: Kernel density of the dependent variable: $g_{i,0307}$

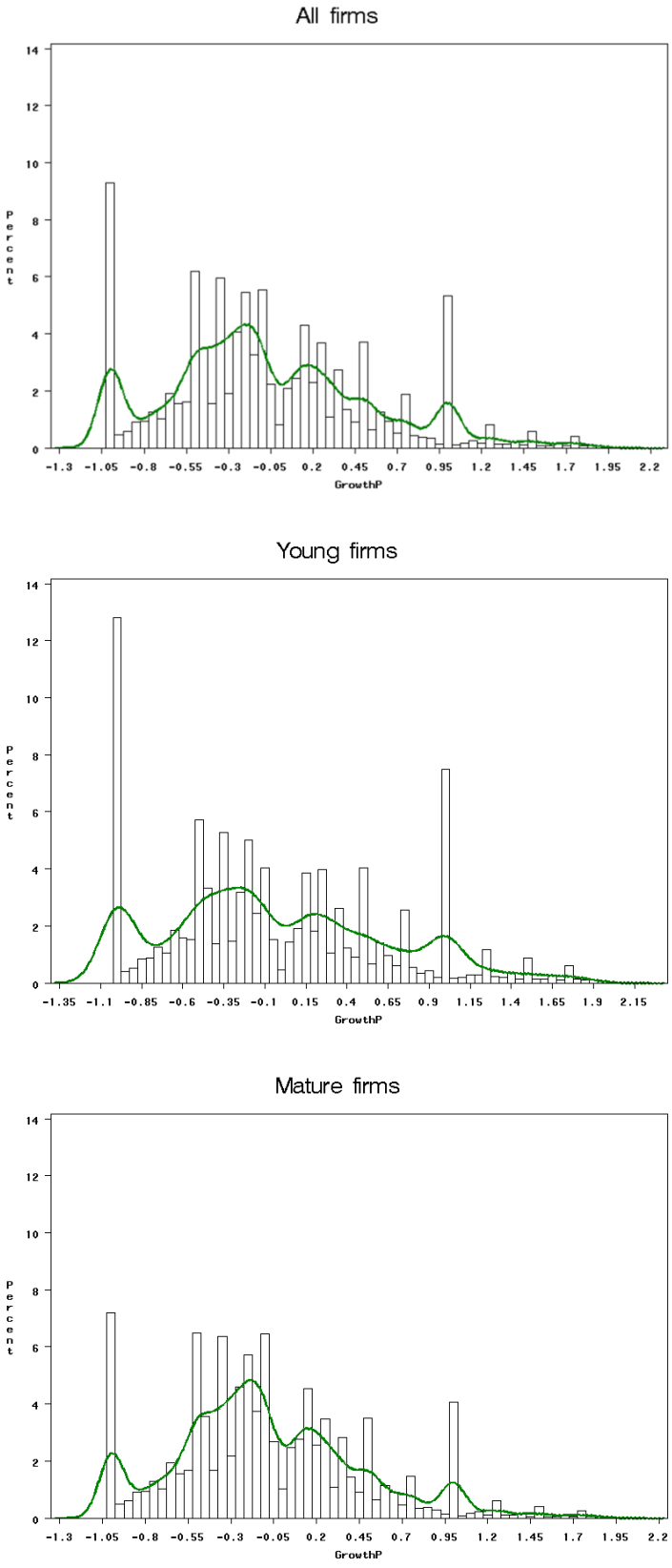

Table 1: Net Job Creation in Tunisia (2003-2007)

	Size				
Age	**Micro (< 6)**	**Small (6-49)**	**Medium (50-199)**	**Large (>200)**	**All**
[01-05]	**147 102**	**55 560**	**65 208**	**96 727**	**364 597**
[05-10]	-72 483	-9 825	**978**	**12 345**	-68 986
> 10	-89 395	-34 154	-25 412	**3 729**	-145 232
All	-14 776	11 580	40 774	**112 801**	150 379

Source: our elaborations on Tunisian Statistical Business Register data.

Table 2: Descriptive statistics; 147,342 firms (62,805 young + 84,537 mature)

(All firms aged at least 5 years)		
Variable	**Mean**	**Std Dev**
g_{0307}	0.0428473	1.3976594
$EMPL_{03}$	4.5982499	36.9514508
$SALES_{0307}$	0.4063708	1.1832574
AGE_{07}	14.0062576	7.7291062
$FOREIGN$	0.0070856	0.0838773

Young firms (5 years ≤ age ≤ 10 years)		
Variable	**Mean**	**Std Dev**
g_{0307}	0.0710368	1.2235980
$EMPL_{03}$	2.7643792	20.0458317
$SALES_{0307}$	0.4919327	1.3187287
AGE_{07}	7.8717140	1.3622877
$FOREIGN$	0.0085503	0.0920723

Mature firms (age>10 years)		
Variable	**Mean**	**Std Dev**
g_{0307}	0.0222939	1.5116669
$EMPL_{03}$	5.9606859	45.5734087
$SALES_{0307}$	0.3428044	1.0671562
AGE_{07}	18.5637886	7.3493354
$FOREIGN$	0.0059974	0.0772106

Table 3: Sample sectoral composition

	Young	Mature	All
Agriculture, forestry and fishing	166	266	432
Mining and quarrying	78	149	227
Manufacture of food products, beverages and tobacco products	803	1253	2056
Manufacture of textiles and wearing apparel	1606	2522	4128
Manufacture of leather and related products	214	569	783
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	882	1330	2212
Manufacture of paper , paper products, printing and reproduction of recorded media	104	229	333
Manufacture of chemicals , chemical products , basic pharmaceutical products and pharmaceutical preparations	104	229	333
Manufacture of rubber and plastics products	81	156	237
Manufacture of other non-metallic mineral products	282	467	749
Manufacture of basic metals and fabricated metal products, except machinery and equipment	962	1777	2739
Manufacture of computer, electronic and optical products, electrical equipment, machinery and equipment n.e.c.	134	213	347
Manufacture of transport equipment	46	72	118
Manufacture of furniture	845	2012	2857
Repair and installation of machinery and equipment	248	290	538
Other manufacturing	241	365	606
Construction	1713	2378	4091
Wholesale and retail trade and repair of motor vehicles and motorcycles	2438	5266	7704
Wholesale trade, except of motor vehicles and motorcycles	2021	2919	4940
Retail trade, except of motor vehicles and motorcycles	19927	28053	47980
Transportation and storage	14884	17162	32046
Accommodation and food service activities	2312	3674	5986
Information and communication	2611	1113	3724
Financial and insurance activities	182	343	525
Real estate activities	275	552	827
Professional, scientific and technical activities	2493	2636	5129
Administrative and support service activities	1075	807	1882
Education,human health and social work activities	1581	1624	3205
Repair of computers and personal and household goods	628	1158	1786
Other personal service activities	3511	4602	8113
other activities	358	351	709
All	62805	84537	147342

Table 4: Correlation matrix

All firms					
	g_{0307}	$EMPL_{03}$	$EMPL_{03}$	*ageE*	*Foreign*
g_{0307}	1.00000				
$EMPL_{03}$	-0.00486**	1.00000			
$SALES_{0307}$	0.08369***	-0.00624**	1.00000		
Age	-0.01851***	0.09309***	-0.07139***	1.00000	
Foreign	0.03133***	0.12669***	0.00106	-0.00832***	1.00000
Young firms					
	g_{0307}	$EMPL_{03}$	$EMPL_{03}$	*ageE*	*Foreign*
g_{0307}	1.00000				
$EMPL_{03}$	0.00652	1.00000			
$SALES_{0307}$	0.10802***	0.00296	1.00000		
Age	-0.02682***	0.02253***	-0.06479***	1.00000	
Foreign	0.07996***	0.15531***	0.01136***	-0.03695***	1.00000
Mature firms					
	g_{0307}	$EMPL_{03}$	$EMPL_{03}$	*ageE*	*Foreign*
g_{0307}	1.00000				
$EMPL_{03}$	-0.00708**	1.00000			
$SALES_{0307}$	0.06757***	-0.00680**	1.00000		
Age	-0.00842**	0.09350***	-0.04741***	1.00000	
Foreign	-0.00042	0.13496***	-0.01218***	0.01001***	1.00000

Note: * significant at 10%; ** significant at 5%; ***significant at 1%

Table 5: Regression results (dependent variable: g_{0307})

	ALL	Young	Mature	T-test coefficients differences (Young-Mature)
Constant	0.0545 (0.0628)	0.242*** (0.083)	-0.0272 (0.0953)	0.2691** (0.1297)
EMPL03	-0.0005*** (0.0001)	-0.0013*** (0.0003)	-0.0003** (0.0001)	-0.001*** (0.0003)
SALES0307	0.0998*** (0.0032)	0.0973*** (0.0038)	0.0979*** (0.005)	-0.0006 (0.0063)
Age	-0.0024*** (0.0005)	-0.0173*** (0.0036)	-0.0013* (0.0007)	-0.016*** (0.0042)
Foreign	0.5195*** (0.0478)	1.0328*** (0.0606)	0.0063 (0.0716)	1.0265*** (0.096)
Gouvernorat (province)				
Tunis	0.0668** (0.0324)	0.0684* (0.0415)	0.0707 (0.048)	-0.0023 (0.0651)
Ariana	0.1378*** (0.0357)	0.1977*** (0.0458)	0.0914* (0.0526)	0.1062 (0.0716)
Ben Arous	0.0486 (0.0348)	0.0382 (0.0443)	0.0611 (0.0517)	-0.0229 (0.0697)
Mannouba	0.0129 (0.0369)	-0.0029 (0.0473)	0.0264 (0.0545)	-0.0293 (0.074)
Nabeul	0.0247 (0.0338)	0.0256 (0.0434)	0.0235 (0.0499)	0.0022 (0.0679)
Zaghouan	-0.0088 (0.043)	-0.0306 (0.0532)	0.009 (0.0656)	-0.0396 (0.086)
Bizerte	0.0225 (0.0346)	0.0291 (0.0444)	0.0227 (0.0511)	0.0064 (0.0695)
Beja	0.0282 (0.0379)	0.0158 (0.0487)	0.0371 (0.0558)	-0.0213 (0.076)
Jendouba	0.0139 (0.0366)	-0.0041 (0.0471)	0.0255 (0.0539)	-0.0297 (0.0735)
Le Kef	-0.0028 (0.0389)	-0.0048 (0.0509)	0.0015 (0.0566)	-0.0064 (0.0784)
Siliana	0.0213 (0.0423)	0.0066 (0.0547)	0.0341 (0.0621)	-0.0275 (0.0851)

Sousse	0.0372 (0.0343)	0.0395 (0.0439)	0.0376 (0.0508)	0.0019 (0.0688)
Monastir	0.0317 (0.0346)	0.0464 (0.0446)	0.0257 (0.0509)	0.0207 (0.0696)
Mahdia	0.0299 (0.0364)	0.003 (0.0469)	0.0492 (0.0537)	-0.0462 (0.0732)
Sfax	0.0453 (0.0331)	0.0527 (0.0426)	0.0469 (0.0488)	0.0058 (0.0665)
Kairouan	0.0072 (0.0362)	-0.0081 (0.0475)	0.0134 (0.0527)	-0.0215 (0.0731)
Kasserine	0.0217 (0.0391)	0.0206 (0.048)	0.0264 (0.0605)	-0.0058 (0.0784)
Sidi Bouzid	0.037 (0.0391)	0.0138 (0.0496)	0.0587 (0.0581)	-0.0449 (0.0783)
Gabes	0.018 (0.0364)	0.0107 (0.0465)	0.0264 (0.0538)	-0.0156 (0.0729)
Medenine	0.0601* (0.0357)	0.0465 (0.0442)	0.0822 (0.0546)	-0.0357 (0.0715)
Tataouine	0.0241 (0.0493)	0.0166 (0.0606)	0.0408 (0.0758)	-0.0242 (0.0986)
Gafsa	0.0307 (0.0396)	0.0155 (0.0513)	0.04 (0.058)	-0.0245 (0.0796)
Tozeur	0.0034 (0.048)	-0.0145 (0.0618)	0.0148 (0.0706)	-0.0294 (0.0964)
Kebeli				
Sectors				
Agriculture, forestry and fishing	-0.008 (0.091)	0.0609 (0.1236)	-0.0348 (0.1297)	0.0957 (0.1858)
Mining and quarrying	0.2535** (0.1104)	1.0317*** (0.1585)	-0.1299 (0.1523)	1.1617*** (0.2301)
Manufacture of food products, beverages and tobacco products	-0.0337 (0.0627)	-0.0515 (0.0803)	-0.0071 (0.0933)	-0.0448 (0.1262)
Manufacture of textiles and wearing apparel	-0.0294 (0.0588)	-0.0066 (0.0744)	-0.0132 (0.0882)	0.0066 (0.118)
Manufacture of leather and related products	0.1997*** (0.0742)	0.1097 (0.1075)	0.2818*** (0.1046)	-0.1722 (0.1568)
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	-0.0675 (0.062)	-0.1438* (0.0788)	-0.0006 (0.0925)	-0.1432 (0.1244)
Manufacture of paper , paper products, printing and reproduction of recorded media	-0.0303 (0.0963)	0.083 (0.1454)	-0.0439 (0.1312)	0.1269 (0.2063)

Manufacture of chemicals , chemical products , basic pharmaceutical products and pharmaceutical preparations	0.0336 (0.098)	0.3242** (0.1495)	-0.054 (0.133)	0.3783* (0.2112)
Manufacture of rubber and plastics products	-0.006 (0.1085)	0.0156 (0.155)	0.0101 (0.1501)	0.0055 (0.2256)
Manufacture of other non-metallic mineral products	-0.0964 (0.0751)	-0.1179 (0.1)	-0.0717 (0.1088)	-0.0462 (0.1525)
Manufacture of basic metals and fabricated metal products, except machinery and equipment	-0.059 (0.0607)	-0.127 (0.0781)	-0.0015 (0.0902)	-0.1255 (0.1224)
Manufacture of computer, electronic and optical products, electrical equipment, machinery and equipment n.e.c.	0.2349** (0.0951)	0.5811*** (0.1313)	0.0377 (0.1344)	0.5434*** (0.1953)
Manufacture of transport equipment	0.2052 (0.1439)	0.5745*** (0.2058)	0.0018 (0.1986)	0.5728* (0.2992)
Manufacture of furniture	-0.0451 (0.0604)	-0.0813 (0.0794)	0.0019 (0.0894)	-0.0832 (0.123)
Repair and installation of machinery and equipment	0.007 (0.0827)	-0.0457 (0.1055)	0.0549 (0.1226)	-0.1006 (0.1658)
Other manufacturing	-0.0395 (0.0787)	-0.1013 (0.1036)	0.0199 (0.1145)	-0.1212 (0.1591)
Construction	-0.0105 (0.0588)	-0.0093 (0.0738)	0.0007 (0.0885)	-0.01 (0.1177)
Wholesale and retail trade and repair of motor vehicles and motorcycles	-0.0775 (0.0567)	-0.1436** (0.0719)	-0.0174 (0.0853)	-0.1262 (0.1141)
Wholesale trade, except of motor vehicles and motorcycles	0.0465 (0.0585)	0.1469** (0.0741)	0.0053 (0.0877)	0.1415 (0.1174)
Retail trade, except of motor vehicles and motorcycles	-0.0882 (0.0548)	-0.1686** (0.068)	-0.0172 (0.0832)	-0.1515 (0.1095)
Transportation and storage	-0.1005* (0.055)	-0.1768*** (0.0682)	-0.0334 (0.0834)	-0.1433 (0.1098)
Accommodation and food service activities	0.0409 (0.0573)	-0.1124 (0.072)	0.1548* (0.0864)	-0.2672** (0.1149)
Information and communication	-0.0621 (0.0591)	-0.136* (0.0716)	-0.0002 (0.0946)	-0.1358 (0.1199)
Financial and insurance activities	-0.0084 (0.0854)	0.0171 (0.1163)	-0.0096 (0.1218)	0.0267 (0.1745)
Real estate activities	0.265*** (0.0761)	-0.2669** (0.1044)	0.5573*** (0.1087)	-0.8242*** (0.1564)
Professional, scientific and technical activities	0.0057 (0.0581)	-0.0392 (0.0723)	0.0405 (0.088)	-0.0797 (0.1161)
Administrative and support service activities	0.1628** (0.0636)	0.267*** (0.0775)	0.0112 (0.0988)	0.2558** (0.1274)

Education,human health and social work activities	0.0296 (0.0598)	-0.0246 (0.0741)	0.0775 (0.0908)	-0.1021 (0.1194)
Repair of computers and personal and household goods	-0.0769 (0.0637)	-0.1593* (0.0833)	-0.0069 (0.0938)	-0.1525 (0.129)
Other personal service activities	-0.0861 (0.0566)	-0.1695** (0.0705)	-0.0111 (0.0856)	-0.1584 (0.1131)
other activities				
N	**147342**	**62805**	**84537**	**147342**

Table 6: Quantile regressions

Quantile =0.25						
	ALL		**Young**		**Mature**	
	COEF	Pr > |t|	COEF	Pr > |t|	COEF	Pr > |t|
Intercept	-0.3714	<.0001	-0.4192	0.0001	-0.4264	<.0001
EMPL$_{03}$	0.0001	0.0037	-0.0002	0.1584	0.0001	0.0037
SALES$_{0307}$	0.1829	<.0001	0.2175	<.0001	0.1617	<.0001
Age	0.0016	<.0001	0.0126	0.0157	0.0007	0.1707
Foreign	0.0243	0.5803	0.0066	0.9262	0.0441	0.3495

Quantile =0.5						
	ALL		**Young**		**Mature**	
	COEF	Pr > |t|	COEF	Pr > |t|	COEF	Pr > |t|
Intercept	-0.0549	0.3742	0.0840	0.5486	-0.1180	0.1477
EMPL$_{03}$	-0.0000	0.6217	-0.0005	0.0041	0.0000	0.8302
SALES$_{0307}$	0.2623	<.0001	0.2978	<.0001	0.2243	<.0001
Age	-0.0024	<.0001	-0.0145	0.0107	-0.0013	0.0007
Foreign	0.0591	0.0090	0.1172	0.0356	0.0353	0.0756

Quantile =0.75						
	ALL		**Young**		**Mature**	
	COEF	Pr > |t|	COEF	Pr > |t|	COEF	Pr > |t|
Intercept	0.8728	<.0001	0.2865	0.0209	0.4209	<.0001
EMPL$_{03}$	-0.0011	<.0001	-0.0001	0.0001	-0.0003	<.0001
SALES$_{0307}$	0.4096	<.0001	0.3010	<.0001	0.3630	<.0001
Age	-0.0626	<.0001	-0.0052	<.0001	-0.0091	<.0001
Foreign	0.2194	0.0089	-0.0016	0.9607	0.1413	0.0014