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Size and Age as Determinants of Employment Growth among Manufacturing Firms in Pakistan

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ABSTRACT

Size-based industrial policy is usually justified in developing countries on the basis of positive externalities arising from an assumed inverse relationship between size and firm dynamism, whereby smaller firms generate jobs faster than larger firms and thus absorb more labour. Theoretically, such a profile could arise from the stylized lifecycle of the typical firm which starts small and grows on the basis of economies of scale until a point where such economies are fully exploited. A similar profile could also be generated by the rising age of the firm. In this case, the firm grows faster when young, driven by the effort, ideas and risk-taking of young owners and managers, but grows slower as they mature and become more risk averse and more cognizant of their firm's capabilities. In recent decades, empirical support has been found for both size and age effects on employment growth in some developed and developing countries. For Pakistan, the joint effects of size and age on employment growth have not been studied at the national level, even though size-based industrial policies have long been applied and age-based policies are growing in popularity. We address this gap in this paper and report three key findings: (i) size is inversely related to employment growth among manufacturing firms in Pakistan; (ii) the effects appear to be concentrated among firms having 50 workers or less; and (iii) age is not a statistically significant determinant of employment growth when all manufacturing sub-sectors are considered in the aggregate.

JEL Classifications: L25, O14

Keywords: Firm Size; Firm Age; Employment Growth; Manufacturing; Pakistan; Industrial Policy

A. INTRODUCTION

In many countries, one important objective of industrial policy is to promote smaller firms. Fiscal, financial and infrastructure subsidies are offered to smaller firms and this is usually justified by one or both of two arguments: that smaller firms deserve help on a fairness basis (equity motivation) or because helping them has positive externalities for national employment, productivity or output growth (efficiency motivation). Such policies often carry a direct financial (or fiscal) cost and may also carry an indirect and longer-term economic cost associated with the distortions introduced by discriminatory incentives. It is important, therefore, to have a good empirical sense of the link between firm size and the relevant policy objective in order to justify size-based industrial policies in a specific country context.

In the case of low income countries, a policy of positive discrimination in favour of small firms is sometimes justified by reference to their superior allocative efficiency with respect to labour. Smaller firms employ more labour per unit capital and this is considered to be more efficient because low income countries tend to be relatively labour-abundant and capital-scarce. Strictly speaking, better alignment with national factor endowments is not sufficient to show superior efficiency. For this, smaller firms have to be more efficient with respect to the use of all factors, in other words, to have higher total factor productivity. This assumption is not uniformly supported by empirical evidence. Indeed, there is much evidence that suggests the opposite, that larger firms have higher levels and growth of total factor productivity as, for example, in the cases of Japan (Urata and Kawai, 2002) and Taiwan (Aw, 2002).

Another rationale rests on the ability of smaller firms to exploit dynamic economies. They are agile and adapt faster to changing market demands. Since they typically operate in competitive sectors with low barriers to entry, they have to innovate more in order to survive. Some evidence for this view is provided by Acs and Audretsch (1990) and Audretsch (2002) who show that the patenting rate for small firms in the US is typically higher than that for larger firms measured on a per employee basis.

However, the above justifications focus on the relationship between size and productivity and this need not translate into an equivalent link between size and employment growth. For the latter, a better rationale may be found in the stylized lifecycle of the typical firm. Most firms start out small, often based on the initiative of a motivated entrepreneur with limited funds. Over time, such firms become larger as owners get more experience, as they reinvest net earnings and as they benefit from economies of scale. This process continues until a stage where diseconomies of scale

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set in. Expanding the firm further risks dilution of management attention and control. Most owner-managed firms plateau at this level. In this conceptual model, size drives employment growth dynamics. However, a plausible story could also be told with age as the driver of employment growth. In this alternative model, a firm grows fast when it is young, based on the effort, ideas and risk-taking typical of young owners and managers. At some point, growth begins to slow as the owners/managers become more risk-averse with age and avoid increasing value at risk.[1] This too would create an employment growth profile featuring rapid growth at younger ages and flatter growth over time.[2]

Which version is correct? The one in which job growth is driven by size or that in which it is driven by age? The answer is important for designing and implementing industrial policy. At present, policymaking in most countries is dominated by popular acceptance of the version in which size drives job growth, although some age-based policies have also been introduced in some countries.[3] Ultimately, disentangling size and age effects on employment growth requires careful empirical analysis. Such analyses have been conducted for developed countries (see Evans, 1987 and Haltiwanger et al., 2013 for the US) as well as for developing countries (see Bigsten et al., 2007 and Ayyagiri et al., 2014). For Pakistan, only one study has tackled this issue (Wadho et al., 2019) but it applies to the textiles and apparel sector only. The main contribution of the present paper is an empirical analysis of size and age effects across all manufacturing sectors for Pakistan using a national random sample of establishments.

Pakistan offers several incentives based on firm size. The State Bank of Pakistan has programmes that affect the supply of credit to small firms through commercial banks or development finance organisations. These generally take the form of lending quotas, credit guarantee and refinance schemes and interest rate subsidies, but often go beyond.[4] The Small and Medium Enterprise Development Authority (SMEDA) provides free or subsidised business development and other services to small firms.[5]

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[1]On the tendency for people to become more risk averse with age, (see Dohmen et al., 2017).

[2]A similar profile can be derived from models (e.g., Jovanovic, 1982) which defines output as a function of management efficiency and links the latter to age. The basic idea is that owner/managers learn about their relative efficiency after they have started a business; those that prove to be less efficient exit while those that prove to be more efficient remain in business and grow larger. Most of this discovery of efficiency takes place when the firm is young and is reflected in higher firm size volatility. As firms age, there is less discovery and less size volatility. One implication of this sort of passive learning process is that younger firms show more dynamism (growth in size) than older firms.

[3]It appears that the attention of Pakistani policy-makers is also shifting in this direction. Recent editions of the Pakistan Economic Survey (for 2018 and 2019) devote more paragraphs to youth-based policies and development schemes than to size-based ones. These policies and schemes typically relate to employment and skills.

[4]The relevant page on the State Bank's website (http://www.sbp.org.pk/70/sup-14.asp) notes that its Policy for Promotion of SME Financing (2017) covers areas like "regulatory relaxations, financing targets, provision of refinance and risk coverage facilities, promotion of value chain financing and programme based lending, adoption of technology, awareness creation and capacity building of bankers as well as SMEs, handholding of SMEs and facilitative taxation regime for SMEs."

[5]The SMEDA website (https://smeda.org/) notes the following among its objectives for small and medium enterprises: facilitation of business development services, helping small firms get financing, providing training, assisting in attainment of international certification, coordinating external donor assistance and conducting sector studies.

An inverse relationship between firm size and employment growth has long been noted for both developed and developing countries. For the US this relationship was highlighted in a paper by Birch (1981) and has since been periodically reconfirmed, including most recently in Neumark et al. (2011). A similar inverse link is reported for low income countries (for recent references, see Aterido et. al. 2011 and Ayyagiri et al. 2014). Pakistani studies in this domain tend to be mostly concerned with the contributions of the entire category of small and medium firms to total employment. This approach, however, confuses mass with dynamism. In most developing countries, as well as in many developed countries, smaller firms form the bulk of all establishments by number as well as by employment contribution. To show that smaller firms are more dynamic requires firm-level data and analysis.[6]

The joint assessment of size and age also goes back decades, with early theoretical contributions by Boyanovic (1982) and empirical tests for US data by Evans (1987) showing firm employment growth to be inversely linked to both size and age. More recently, Haltiwanger et al. (2013) reported that the inverse link with size disappears in the US data once firm age is controlled for. Young firms were found to have the fastest rates of job creation, thus highlighting the role of startups in the employment picture. Among studies for developing countries, Ayyagiri et al. (2014) find that both size and age matter: smaller and younger firms have higher rates of job creation than larger and more mature firms. In the case of Pakistan, Wadho et al. (2019) also find both size and age to be inversely related to employment growth but, as noted earlier, their study is confined to only one manufacturing sub-sector (textiles and apparel).[7]

In attempting to clarify the roles of size and age in firm dynamics in Pakistan, we are specifically interested in the following questions: Is there a robust relationship between size and employment growth in the presence of firm age? Is there a robust relationship between firm age and employment growth in the presence of size? How do these relationships unfold across different size and age groups?

To generate results that can provide guidance for national level policies, we need a database that has at least the following four characteristics: it is national in scope, collected as a random sample, focused on the establishment as the unit of reporting, and contains data on employment growth at the establishment level.[8] For Pakistan, the latest available database with these four characteristics is the World Bank Enterprise Survey conducted during 2013-15 (WBESP, 2013). This survey was administered to owners or top managers of a representative sample of formal (registered) private non-agricultural firms from all over Pakistan.[9] This is the database we use, focusing only on manufacturing sector firms.

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[6]Sur et al. (2014) report results from a national sample of rural non-farm enterprises in Pakistan in which they examine the role of investment climate variables and include size. They report a negative coefficient for size but their dependent variable is output (or value-added) rather than employment growth.

[7]Waheed (2017) includes age (but not size) as a control variable in an empirical study of the effect of innovation on employment growth in Pakistan.

[8]While we use the terms interchangeably in the paper, our analysis is conducted at the establishment and not at the firm level. More than one (locationally-defined) establishment may be part of the same (legally-defined) firm.

[9]The survey covered 1247 firms stratified by industry, establishment size and geographic region. After removing unreliable and inaccurate responses (as determined by the enumerator) and selecting only manufacturing firms, the dataset was left with 971 usable observations. A description and discussion of the survey methodology is accessible at: https://www.enterprisesurveys.org/en/methodology

The remainder of this paper is organised as follows. Section B lays out the empirical strategy we follow. Section C discusses the results of the empirical analysis. Section D contains some concluding remarks on the implications of our results for the design of industrial policy in Pakistan.

B. EMPIRICAL STRATEGY

Defining the Dependent Variable. The WBESP provides information on current employment (L1, at the time of the survey) and employment two years ago (L2). Accordingly, we can calculate the percentage change in employment between L1 and L2 (divided by 2 to get an annual rate) and use this as our dependent variable. We calculate the percentage change as the difference between the logarithms of the relevant employment size numbers. This is shown below:

$$L_{ijr} = (log(L1) - \log(L2))*100/2$$

Adjusting for Fixed Effects. Regression results based on cross-section data are subject to the influence of many unobserved variables. One way to offset the effect of some unobserved variables is to use the "fixed effects" of some known exogenous proxies. In our present paper, we use industry/sector and region as these proxies. Since industrial policies (tax breaks, financial subsidies, infrastructure access etc.,) often vary by sectors and province, including these proxies can help account for such variation.

Estimating Strategy. The OLS form of our basic model is as follows:

$$L_{ijr} = \beta_1 \quad (size_{ijr}) + \beta_2 \quad (age_{ijr}) + \delta_j + \theta_r + \varepsilon_{ijr}$$

where L_{ijr} if the employment growth rate for the *i*th firm, in industry j belonging to region *r*. The number of employees in the base year (L2) is denoted by $size_{ijr}$ and the age of the firm at the time of the survey is denoted by age_{ijr}. ε_{ijr} is the error term, δ_j denotes industry fixed effects and θ_r region fixed effects.

We estimate this model for three size groups and three age groups. Recall that the stylised model provides a basis for dividing the growth of a firm over time into at least two and possibly three phases: an early phase, where due to small size or young age, it grows rapidly; a middle phase where the growth rate moderates and a latter phase where employment may even decline. One testable implication of this model is that the employment growth rate among larger firms will be lower than that among smaller firms and the employment growth rate among older firms will be lower than that among younger firms. In other words, there is an inverse relationship between size (or age) and employment growth.

Theory provides no guidance as to what the appropriate size and age groups should be. The convention in many developing countries is to group firms by size as follows: Small, for firms having less than 20 workers; Medium, for firms having between 20 and 99 workers; and Large, for firms having 100 or more workers. This convention is used by the WBESP in reporting its results and we adopt it for this paper as well. As far as age is concerned, we define the following three groups: Youngest, for firms 10 years or less in age; Young, for firms between 11 and 20 years in age; and Mature, for firms more than 20 years in age.[10]

[10]Ayyagiri et al. (2014) identify their youngest group, Startups, as being between 0 and 5 years of age. Such firms form only 3 percent (28 observations) of our sample. Results based on such a small fraction of the sample would not have been credible; hence we use a larger age group (up to 10 years) to generate a comparison of age/employment growth slopes over time.

Robustness Checks through Control Variables. We then subject the basic model to robustness checks through the inclusion of multiple control variables. The literature suggests that, beyond size and age, employment growth is typically linked to two sets of factors, one external to the firm and the other internal to it. The external set refers to the environment in which firms operate and the internal to owner/manager characteristics and preferences. The following aspects of the investment climate of a country are usually found to be important among external factors: infrastructure (especially transportation and power); regulatory burden (especially as expressed through tax administration); and access to finance. While the relevant literature for Pakistan is sparse, the importance of most of the above factors is confirmed by information in the WBESP survey that identifies what firms self-report as the most important constraints they face.[11]

Accordingly, we select the following variables to control for the investment climate in Pakistan: availability of electricity; quality of tax administration; and access to finance. The availability of electricity is measured by whether or not the firm had a generator or shared one. The burden of tax administration is measured by whether or not the establishment received a visit from a tax official during the survey year. The assumption is that such a visit would have involved the payment/collection of a bribe. Access to finance is measured by whether or not the firm had an active loan or a line of credit.

We also select control variables that relate to choices made by owners/managers regarding participating in exporting, training for employees, obtaining international certification, and generating innovative products. All of these are reported as binary variables. Participating in exporting measures whether or not the firm exports any amount of its output. Training indicates whether or not the firm offers in-service training to its staff. International certification measures whether or not the firm had obtained ISO 9000 and/or related certifications. Innovation measures whether or not the firm self-reports producing and marketing a new product.

The OLS form of the fuller model including multiple control variables is as follows:

$$L_{ijr} = \beta_1 \quad (size_{ijr}) + \beta_2 \quad (age_{ijr}) + \beta_3 Controlvariables_{ijr} + \delta_j + \theta_r + \varepsilon_{ijr}$$

Summary Statistics. Summary statistics (see Table 1) reveal quite a lot of variation in the size of firms, ranging from a minimum of 1 and a maximum of 15000, though the median firm is small at 20 employees. There is also a lot of variation in firm age which ranges from a minimum of 2 to a maximum of 77. The median firm is a relatively mature 20 years.[12] Among firm characteristics of interest, we note that as many as 35 percent report having international certification which is more than twice the percentage that report engaging in exporting. This suggests that many firms obtain international certification for advantages or benefits that apply in the domestic market. Twenty-two

[11]For example, 75 percent of the respondents in the sample identified the availability of electricity as a leading constraint and 34 percent reported tax administration processes as an impediment.

[12]Almost three-quarters of the sample consists of sole proprietors with the owner very likely being the top or key manager as well. The median experience of top managers is 15 years which is three quarters of the median age of firms and suggests low turnover in this category. These characteristics suggest that owner/manager age should play an important role in firm dynamism as noted in the introductory section.

percent also report providing training opportunities to their workers. Among business climate variables of interest, we note that 57 percent report having been visited by a tax official in the survey year and 53 percent report owning or sharing a generator. This is consistent with the general sense among respondents that these factors are important constraints to doing business in Pakistan. We also note that only 9 percent report having a new loan or a line of credit which suggests limited access to finance. Finally, we note that as many as 29 percent report having introduced a new product, reflecting attempts at innovation in a competitive environment.

Table 1

Summary Statistics

	Mean	Median	Std. Dev.	Min	Max
Employment Growth (Log. Diff.)	5.47	0.00	18.62	–101	129.51
Number of Employees in Base Year	166.86	20.00	770.94	2	15000
Age of Firm	23.03	20.00	13.77	2	77.00
International Certification	0.35	0.00	0.48	0	1.00
Formal Training	0.22	0.00	0.41	0	1.00
Exporter	0.16	0.00	0.37	0	1.00
New Loan or Line of Credit	0.09	0.00	0.29	0	1.00
Owned or Shared a Generator	0.53	1.00	0.50	0	1.00
Visit by Tax Officials	0.57	1.00	0.49	0	1.00
Introduced a New Product	0.29	0.00	0.46	0	1.00

C. EMPIRICAL RESULTS AND RELATED DISCUSSION

The Basic Model

We estimate the model as follows. First, we run a model in which only size and age feature, along with industry and region fixed effects. In this version, both size and age are entered as continuous variables but in their logarithmic form in order to minimise the effect of outliers. The results are shown in column 1 of Table 2 and allow us to assess the effect of size and age for the full sample. Second, we disaggregate the sample by size and age. The smallest size category and the youngest age category are excluded in the regression. The results are shown in column 2 of Table 2.

The results show that firm size is inversely related to employment growth but firm age is not. As firms grow larger, employment growth gets smaller but the same does not appear to happen with age. This result holds even when the sample is disaggregated. Employment growth for medium and large firms is smaller than it is for small firms (the excluded group). A similar pattern does not apply across the age groups. This result is different from that of Ayyagiri et al. (2014) where both size and age are shown to matter for firms in developing countries. It is also different from Wadho et al. (2019) where both size and age are reported to be inversely related to employment growth among textile and apparel firms in Pakistan. It is, however, consistent with Waheed (2017) in which an insignificant result is reported for age using a national multi-sector sample.[13]

[13]We have also estimated a version of the basic model in which the non-linearity of size and age effects is tested through the use of the squares of the size and age variables (in their logarithmic forms). The results are similar to those reported in Table 2: size has a significant quadratic relationship with employment growth but age does not have a significant relationship.

Table 2

Impact of Size and Age on Employment Growth

Dep. Var. is log(l1)- log(l2))*100/2	(1)	(2)
Number of Employees in Base Year(ln)	–2.15***	
	(0.44)	
Age of firm (ln)	–0.52	
	(1.15)	
Medium-sized Firms		–9.54***
		(1.86)
Large Firms		–8.08***
		(1.68)
Younger Firms		–3.32
		(2.42)
Mature Firms		–1.95
		(2.40)
Constant	12.86***	11.47***
	(3.72)	(2.26)
Observations	804	804
R-squared	0.10	0.13

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.
Includes industry and region fixed effects.

Robustness Checks

We check for robustness by adding a set of control variables to the basic model. The relevant results are reported in Table 3. The results suggest that our basic model is robust. The sign and significance of the size and age variables do not change with the addition of a large set of control variables. Employment growth remains inversely linked with size but not with age. This is true whether size and age are taken in the aggregate or separated into groups.

Brief Comments on Control Variable Results

While the control variables are not of principal interest to this paper, a few remarks are in order to show how they compare with results found in other studies. With regard to the variables that reflect firm characteristics, we note that getting certification and providing training to workers are positively and significantly related to employment growth. This is consistent with our priors. We are unaware of any studies for Pakistan that show such results. We also note that innovation is negatively associated with firm dynamism. This is contrary to the results reported by Waheed (2017) who finds a positive link between product innovation and employment growth among Pakistani manufacturing firms, though only for those in low-tech sectors. The difference in our results may be due to differences in our estimating strategies. Waheed (2017) models the innovation-dynamism link as an endogenous one and estimates it via a two stage procedure. It also differs from Wadho et al. (2019) in which various measures of

Table 3

Effect of Size and Age in Presence of Multiple Control Variables

Dep. Var. is log(l1)- log(l2))*100/2	(1)	(2)
Number of Employees in Base Year(ln)	–3.40***	
	(0.70)	
Age of Firm (ln)	–2.28	
	(1.43)	
Medium-sized Firms		–10.17***
		(2.07)
Large Firms		–12.12***
		(2.77)
Younger Firms		–4.01
		(2.82)
Mature Firms		–4.15
		(2.95)
International Certification	11.33***	9.96***
	(2.18)	(2.08)
Formal Training	7.20***	6.40***
	(2.24)	(2.17)
Exporter	1.24	1.38
	(2.39)	(2.43)
New Loan or Line of Credit	–0.12	–0.06
	(2.77)	(2.72)
Owned or Shared a Generator	–0.95	–1.11
	(1.68)	(1.68)
Visit by Tax Officials	–8.22***	–8.21***
	(1.74)	(1.74)
Introduced a New Product	–4.29**	–3.38*
	(1.81)	(1.81)
Constant	26.49***	18.33***
	(5.04)	(3.02)
Observations	675	675
R-squared	0.20	0.21

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.
Includes industry and region fixed effects.

innovation are found to be positively linked to employment growth among Pakistani textile and apparel firms.[14]

As far as the business environment variables are concerned, we note that the quality of tax administration turns out to have a significant adverse effect: visits by tax officials are associated with lower rates of employment growth. This is also reported for Pakistan by Abbas et al. (2020). Similar, though more nuanced, results

[14]Note that there is no *a priori* basis to necessarily expect a positive link between product innovations and employment growth at the firm level. It is possible, for example, that such innovations allow the firm to enjoy a quasi-monopoly position in a local market which it then exploits through a lower output and higher price equilibrium outcome than in the case without the innovation. One would, however, expect a positive link between product innovations and firm-level productivity.

have been reported for corruption variables by Aterido et al. (2011) for developing countries as a whole. Infrastructure, as measured by the availability of a generator, and access to finance, as measured by having a loan or a line of credit, do not show up as significant. On infrastructure, we note that Aterido et al. (2011) find a negative link between the incidence of power outages and employment growth for small, medium and large firms but a positive link for micro firms. They interpret this as indicating that micro firms use less energy in their activities and are not sensitive to the availability of power. We also note that Ahmed and Hamid (2011) report a positive link between access to finance and employment growth in Pakistan. However, they assess this link as an endogenous one and estimate it using a two stage procedure, which we have not done. For further guidance on this particular issue, we would urge the reader to consult that study.

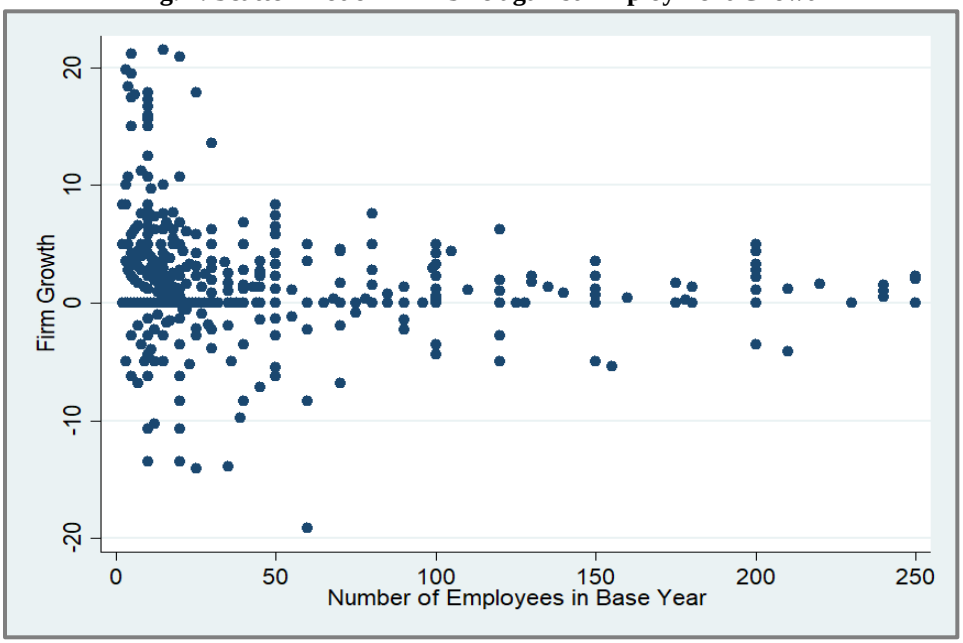
D. FINDINGS AND POLICY IMPLICATIONS

We find three main results. First, firm size is a statistically robust determinant of employment growth in Pakistan. As firm size increases, the rate of employment growth declines. Second, employment dynamism appears to be concentrated at the small end of the distribution of firms by size. Third, firm age does not have a statistically significant impact on employment growth. In this section, we explore some additional aspects of these findings.

Exploring the Link between Firm Size and Employment Growth

We first look at the scatter plot displayed by the data when we put firm size on the horizontal axis and employment growth on the vertical axis (see Figure 1 below.)

Fig. 1. Scatter Plot of Firm Size against Employment Growth



The scatter plot recreates in graphical form the two main results for size that we have established through statistical analysis in the main body of the paper. It shows a negative relationship between firm size and employment growth and it shows that the action is concentrated at the smaller end of the size distribution where firms have less than 50 employees or so. After that, the slope is mostly flat.[15]

The scatter plot also shows considerable churning among smaller firms who not only generate more jobs but also destroy more jobs. Small new firms face difficult odds and many of them suffer steep job losses as well as rapid job gains. Some, indeed, may not survive the challenges of establishing a new business. This pattern is widely observed among firms in both developed and developing countries. It sets up a challenge for policy-makers who, when faced with an application for benefits under some government programme, must assess whether the applicant firm will create more jobs than it destroys over some period of time. This requires additional data and research on the link between firm characteristics, contextual considerations and job creation outcomes. In other words, though it is reasonable to start with it, the criterion of size alone may not be a sufficient basis for a confident decision.

Why does Firm Age not have an Impact on Employment Growth in Pakistan?

Firm age does not turn out to be significant in any of the variations of our model. This is surprising in view of the significance revealed in other studies noted for the US as well as for developing countries as a whole. We examine this matter further by looking at the distribution of firms by age in our sample.

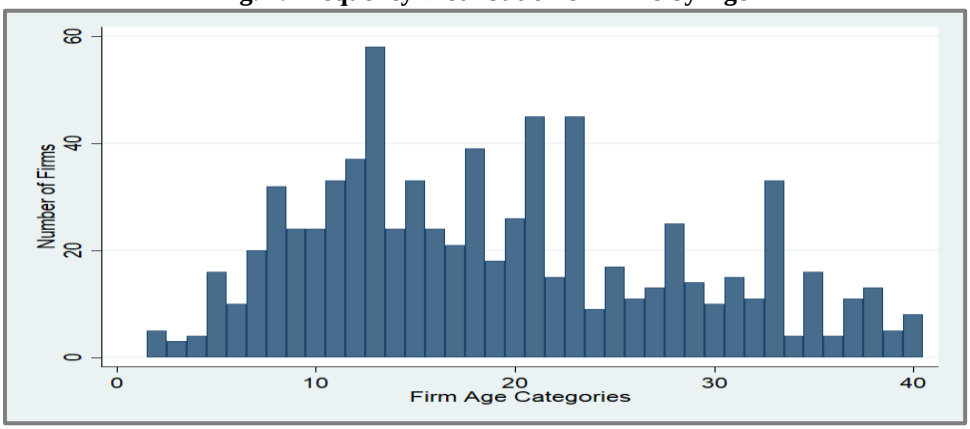
Figure 2 shows that the distribution of firms by age is not left-skewed. There are relatively few very young firms. Only around 3 percent or so of our sample consists of firms at or under 5 years of age, a limit often used to define start-ups. In many countries, net job creation is highest among such start-ups. With relatively few start-ups in our sample, we should expect less employment dynamism on average. The relevant question then is why are there so few start-ups among manufacturing firms in Pakistan? The answer may lie in the costs associated with registering formally. Many firms may avoid registering formally because they may be afraid of attracting attention from the tax authorities and other government agencies. It may be only after they are older and well-established that they perceive the benefits of registration to outweigh the costs.[16] This aspect of start-up dynamics in Pakistan needs to be further investigated through better data.

Pakistan also appears to have a low entrepreneurship rate. Information on this is available through the Global Economic Monitor database for Pakistan (2012). According to this, our Total early stage Entrepreneurship Activity (TEA) rate for opportunity-based (rather than need-based) entrepreneurship was just over 3 percent. This is only one third as much as the 9 percent average found in other low income countries in the GEM sample. Furthermore, only 3.4 percent of respondents reported being established as new

[15]Figure 1 is based on 766 observations because we have excluded firms having more than 250 workers in order to be able to focus on the detail at the smaller-size end of the scatter plot.

[16]Almost one quarter of the firms in our sample report not having been registered formally when first established. This is consistent with our finding of a negative impact on firm growth arising from the burden of dealing with the tax authorities.

Fig. 2. Frequency Distribution of Firms by Age



business owners for up to three and half years. This compares unfavourably with an average survival rate of 13 percent in other low income countries in the GEM sample. These characteristics show entrepreneurship to be relatively weak in Pakistan. This is consistent with our finding of an insignificant contribution from young firms to overall employment dynamism: not enough such firms are being created by Pakistani entrepreneurs and/or not enough are surviving past their early years.[17]

One further observation is relevant. While we have not found age to be a significant determinant in the full sample, it may be significant for sub-samples focusing on specific sectors and types of firms. For example, Wadho et al. (2019) report that smaller, younger and innovative firms exhibit much higher employment growth than the sample average in Pakistan's textiles and apparel sector.[18] This is a useful finding that offers a path out of the policy dilemma faced when size alone is relied upon as a benefits-granting criterion. If policy makers had access to additional information beyond size, such as the age, innovation status and sub-sector of applicant firms, they should be able to make better decisions.

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[17]A more recent survey on Pakistani entrepreneurship was conducted in 2019. This shows a TEA rate of 3.7 percent which places Pakistan 49th among the 50 countries that participated in 2019. The relevant country report for Pakistan has not been published but summary results are available in the global report (see Global Entrepreneurship Monitor, 2020).

[18]The mean net employment creation in the combined category of small, young and innovative firms is reported as being more than 6 times higher than the sample average (Wadho et al. 2019, Table 7).

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