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Good turnover and bad turnover: Barriers to business and productivity

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ABSTRACT

Entrepreneurship, as reflected in industry turnover rates, is a central force behind output and productivity growth. However, cross country comparisons suggest that turnover rates are remarkably independent of barriers to business: Singapore, one of the most entry-friendly countries in the world, has the same industry turnover rate as Uzbekistan, a country where entry is considerably more difficult. In this paper, I suggest the solution to this apparent puzzle lies in the effect of survival barriers, which, like entry barriers, are higher in Uzbekistan than in Singapore. In other words, with similar turnover rates, Singapore is characterized by "good" turnover, whereas Uzbekistan is characterized by "bad" turnover.

1. Introduction

Entrepreneurship plays a central role in the process of economic growth. In particular, Schumpeter's (1942) model of creative destruction posits a "link between market turbulence and economic growth" (Audretsch and Fritsch, 1996).[2] According to Santarelli and Vivarelli (2007), "entrepreneurship (is) the process by which new enterprises are founded and become viable, and the most common way of measuring it is to look at entry rates".[3] Aghion and Howitt's (1992) model of innovation and growth formalizes this idea: the comparative statics with respect to a variety of parameters imply a positive correlation between the arrival of new firms and economic growth (cf. their Proposition 1).

Following this theoretical reasoning, the rate of industry turnover – the number of entries and exits in a given industry divided by the total number of firms – is considered a healthy sign in terms of economic growth. For example, Bartelsman et al. (2009) find that firm turnover accounts for a large fraction of total productivity growth in a sample of 15 countries.[4]

Consistently with this view, one would predict a negative relation between barriers to business and firm turnover (and thus a negative relation between barriers to business and economic growth and productivity). In fact, such a negative relationship would follow from a model such as Hopenhayn (1992) or Asplund and Nocke (2006). However, aggregate cross-country evidence seems to be largely inconsistent with this theoretical prediction. Fig. 1 plots the average firm entry rate in each country against that country's position in the World Bank's doing business ranking, where the top rank corresponds to the economy with most favorable conditions to doing business. As can be seen, there is essentially no relation between the entry rate and how good the conditions for doing business are: Singapore, the country ranked first in terms of ease of business, has an entry rate of 19.4%, approximately the same as Uzbekistan (18.2%), which is ranked 166th (and last in my sample) in terms of business friendliness.

In this paper, I propose a solution to this "turnover puzzle". The idea is that some barriers to business (e.g., the cost of starting a

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[2] In this paper, I will use the terms "turnover" and "turbulence" interchangeably, both meaning the sum of the entry and exit rates. In a steady state with a constant number of firms, turnover is also measured by 2 times the entry rate.

[3] Leora Klapper, Raphael Amit, Mauro F. Guillén define entrepreneurship as "any economic unit of the formal sector incorporated as a legal entity and registered in a public registry, which is capable, in its own right, of incurring liabilities and of engaging in economic activities and transactions with other entities".

[4] Allocating productivity growth to the firm turnover is somewhat arbitrary as it depends on the period of consideration. In other words, the answer to the question of "how much of productivity growth during period t can be accounted by firms that entered and exited during period t" depends crucially on period length. Ultimately, for a long enough period the answer is 100%.

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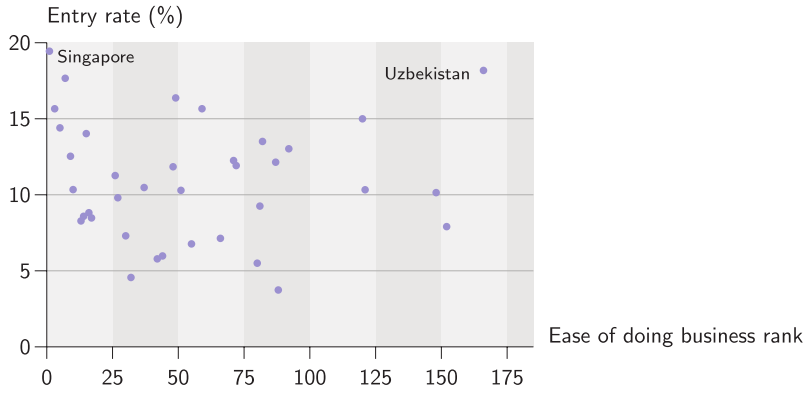

Fig. 1. Ease of doing business and industry turnover in various countries.
Source: World Bank.

business) lead to lower industry turnover, whereas other barriers to business (e.g., the difficulty in obtaining operating credit) lead to higher industry turnover. To the extent that the level of these barriers is correlated across countries, we are likely to observe a weak relation between business friendliness and industry turnover. Put differently, an economy like Singapore, with very low barriers to business, may have the same rate of industry turnover as an economy like Uzbekistan, with very high barriers to business. However, the *nature* of industry turnover is likely to be very different in these two economies. Turnover in Singapore corresponds primarily to higher productivity firms replacing lower productivity firms ("good turnover"). By contrast, turnover in Uzbekistan corresponds primarily to involuntary exit ("bad turnover").

2. Model

In this section, I propose a simple theoretical model of firm entry and exit in the tradition of Jovanovic (1982) and Hopenhayn (1992). One important difference is that I explicitly consider a barrier to survival that leads to involuntary exit.

- **Timing.** Consider an industry in steady state equilibrium. There is an infinite supply of atomless ex-ante undifferentiated entrants. Each potential entrant knows it will be of some type θ, where θ measures total factor productivity, but prior to entry each entrant only knows the distribution $F(\theta)$, not the actual value of θ. Upon entry, that is, having paid the entry sunk cost and the first period fixed cost, a new entrant learns its type θ. At the end of each period, each firm must decide whether to remain active or exit (voluntary exit). Moreover, with probability λ each firm is subject to a shock that leads to exit (involuntary exit). We thus have both voluntary and involuntary exit. I will assume λ is independent of firm size or age.[5]

  Notice that, since a firm's type is revealed during the first period, in a steady-state equilibrium all voluntary exit takes place during the first period. In other words, if a firm decides to remain active in the first period, it also decides to remain active in all subsequent periods.
- **Voluntary and involuntary exit.** My involuntary exit modeling assumption is central to the paper's results; it thus warrants closer scrutiny. I do not expect it to be taken literally. While there may be some cases when local mafias force entrepreneurs and firms out of business, most exit decisions are, strictly speaking, voluntary decisions. What I mean by involuntary exit is exit decisions that are not motivated by "natural" causes such as low productivity but rather by firm idiosyncratic shocks resulting from barriers to business. For example, a firm that is unable to secure a critical license from the government, or make the appropriate contact with financial institutions, may find itself in such an unfavorable situation that exit is its best decision; a voluntary decision, strictly speaking, but one that the firm would not have taken in a world without artificial barriers to business.

  The sources of barriers to survival that lead to such involuntary exit can be varied. One common complaint is the difficulty in obtaining credit (cf. Paravisini et al., forthcoming); another is the difficulty in obtaining necessary licenses (to operate, to export, etc.), which frequently is associated to corruption (cf. Shleifer and Vishny, 1993); still another one is given by discretionary government crackdowns (cf. Aidis and Adachi, 2007).

  If these barriers to business and survival apply equally to all firms, then the right way to model them is to assume a higher fixed or variable cost. However, anecdotal evidence suggests that barriers to survival do not affect all firms equally. Specifically, I assume that some firms are particularly hit by these barriers to survival to the extent that exit is their best choice.
- **Firm profits and voluntary exit.** Suppose that each firm's profit function is given by $\pi(q; p, \theta) = p\,q - C(q; \theta) - \phi$. Let q^* be the profit maximizing output level, that is, the value that solves $p = C'(q; \theta)$, and let optimum profit level be given by $\pi^*(p, \theta)$. Next let θ' be the indifferent firm's type, that is, the value of θ that solves $\pi^*(p, \theta) = 0$. It follows that the probability of voluntary exit is given by $x = F(\theta')$.
- **Value function and free-entry condition.** The free-entry condition is that the expected value upon entry is equal to entry cost:

$$\int_{-\infty}^{\theta'} \pi^*(\theta, p)\, dF(\theta) + \frac{1}{1 - \delta\,(1 - \lambda)} \times \int_{\theta'}^{+\infty} \pi^*(\theta, p)\, dF(\theta) = \psi, \tag{1}$$

  where ψ is the entry cost. In other words, there are two possibilities to consider (regarding the left-hand side of (1)). If an entrant's type is lower than θ', then the entrant remains active for one period, receives profit $\pi^*(\theta, p)$, and exits. This corresponds to the first term. If the entrant's type is greater than θ', then there is no voluntary exit: the entrant remains active and receives payoff $\pi^*(\theta, p)$ until it is forced out, which happens with probability λ in each period.

[5] A simple extension of the model could include the possibility of a type contingent λ. If the slope of such a relation is small, then the results I present next follow by continuity. I will later return to this assumption.

- **Entry, exit, and industry turnover.** Let m be the measure of active firms and n the measure of entrants (and exiters) in each period. The measure of voluntary exits is given by $n\,F(\theta')$. The measure of involuntary exits is given by $\lambda\,(m - n\,F(\theta'))$. In a steady state, the total measure of exiters must equal the measure of entrants:

  $$n = n\,F(\theta') + \lambda\,(m - n\,F(\theta')).$$

  This implies a turnover rate

  $$r = 2\,\frac{n}{m} = 2\,\frac{\lambda}{1 - (1-\lambda)\,F(\theta')}. \tag{2}$$

3. Analytical results

I first present two theoretical results regarding the relation between barriers to business, industry turnover, and industry productivity.

Proposition 1. *Equilibrium industry turnover is* (a) *decreasing in entry barriers, and* (b) *increasing in survival barriers (the latter provided* λ *is sufficiently low).*

The proof of this and the next proposition may be found in the Supplementary materials file (see Appendix A). Part (a) of Proposition 1 confirms the conventional wisdom that barriers to entry lead to lower turnover rates. It is also consistent with the theoretical results in Asplund and Nocke (2006). To the extent that barriers to entry lower social welfare (which they do in a competitive model) and to the extent that barriers to entry are the main source of variation, we may also conclude that higher levels of industry turnover are associated to higher levels of social welfare.

The novel part of Proposition 1 is that survival barriers may *increase* the level of industry turnover. Since survival barriers decrease social welfare, this result breaks the link between industry turnover and social welfare which would result from entry barriers alone. Moreover, to the extent that entry barriers and survival barriers are correlated across countries, the simple regression of industry turnover on entry barriers is likely to suffer from an omitted variable bias.

Although the impact of barriers to business on industry turnover varies according to the type of barrier, when it comes to productivity all barriers to business have an negative impact:

Proposition 2. *If* λ *is sufficiently low, then average industry productivity is decreasing in entry barriers and in survival barriers.*

4. Conclusion

I propose a simple model of firm entry (with voluntary and involuntary exit) that solves the "turnover puzzle". From a policy point of view, my analysis suggests that industry turnover is neither a good policy goal nor a good indicator of policy success. By contrast, barriers to business are unequivocally bad for industry productivity: they either decrease the level of "good turnover" or increase the level of "bad turnover".

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Appendix A. Supplementary material

Supplementary material related to this article can be found online at http://dx.doi.org/10.1016/j.econlet.2014.08.022.

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