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What explains the survival gap of pushed and pulled corporate spin-offs?

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HIGHLIGHTS

- This paper explores the sources of pushed and pulled spin-offs' survival gap.
- We use novel multivariate decomposition techniques for hazard models.
- Unconditionally, pushed spin-offs survive longer than their pulled counterparts.
- The survival gap is largely explained by different human capital endowments at entry.

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ABSTRACT

Unconditionally, pushed spin-offs are found to survive longer than their pulled counterparts. Using matched employer–employee data and novel multivariate decomposition techniques, we show that pushed spin-offs' relative survival advantage is mostly explained by their larger human capital endowments at entry.

1. Introduction

Not all spin-offs arise from the identification of a business opportunity.[2] Many employees of incumbent firms also decide to launch their own business to escape from deteriorating job conditions or as a response to a recent job loss, though only more recent studies have recognized the importance of so-called "pushed spin-offs". The few analyses of spin-offs' survival conducted so far – including those restricted to very particular industries (e.g., Buenstorf, 2009; Cabral and Wang, 2013) – generally suggest that pulled spin-offs outperform their pushed counterparts (e.g., Eriksson and Kuhn, 2006; Dahl and Sorenson, 2014) based on several arguments.[3]

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[2] Spin-offs have been broadly defined as start-ups founded by a former employee (or a group of them) of an existing firm, typically in the same industry of the parent firm (Dahl and Sorenson, 2014).

[3] Pulled spin-offs' outperformance is also documented for other performance measures, such as employment and revenues growth (Bruneel et al., 2013), and returns on assets (Dick et al., 2013).

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First, pulled spin-offs may have the comparative advantage of being based on a unique business opportunity and possibly keep strong relationships with their parent firm (PF) after entry, which potentially provides them with an easy link to information, networks, markets, and resources (e.g., Buenstorf, 2009). Second, there might be a positive correlation between PF and spin-off performances, making the success of these new ventures somewhat hereditary (e.g., Dick et al., 2013). Finally, it is also argued that spin-offs generated from surviving PFs are typically founded by individuals with higher entrepreneurial talent on average (e.g., Cabral and Wang, 2013).

Nevertheless, despite this greater attention and support toward opportunity-driven spin-offs, pushed spin-offs may perform equally well or even better if they enter with some favorable initial conditions. Pushed and pulled spin-offs may differ in several aspects that potentially moderate or amplify their survival gap (e.g., Dahl and Sorenson, 2014; Rocha et al., 2015), such as the geographic proximity to the PF, the presence and the quality of co-workers (employees moving from the PF to the new spin-off) in the initial workforce, and founders' human capital. In that case, the pushed–pulled survival gap may be mainly caused by differences in their initial conditions, more than by the event triggering the decision in favor of entrepreneurial entry.

Reported research largely neglects these potential differences in spin-offs' start-up conditions. Accordingly, besides evaluating whether any notable survival differences remain between pushed and pulled spin-offs after controlling for a number of initial characteristics in which these firm might differ, this paper explores how much the aforementioned start-up conditions may account for the difference in hazard rates observed between the two types of firms using novel decomposition methods.

2. Data and methodology

Our data come from *Quadros de Pessoal*, a large longitudinal matched employer–employee dataset from the Portuguese Ministry of Employment, covering all firms in the private sector that employ at least one wage earner. We follow the main literature and identify new spin-offs as start-up firms founded by individuals who have recently left paid employment (in $t-1$ or $t-2$) and who have established a new business in the same 2-digit industry of the previous employer.

Spin-offs were then classified into "pushed" or "pulled" according to the situation of the PF. Spin-offs established by individuals coming from a PF that either closed or suffered a substantial downsizing (equal to or greater than 30% of the workforce, with a minimum of five separations) were classified as "pushed spin-offs". The remaining cases were classified as "pulled spin-offs", which may include corporate spin-offs resulting from opportunities exploited by an incumbent firm, or spin-offs initiated by one or more employees identifying an opportunity and deciding to explore it independently of their employer. A total of 24,860 spin-offs (10,128 pushed and 14,732 pulled) entering during the period 1992–2007 were identified.

To study which factors may affect spin-off survival and to test whether significant survival differences exist between pushed and pulled spin-offs, we estimate a piecewise constant hazard model, incorporating a gamma mixture distribution to control for firm-level unobserved heterogeneity. The probability of exit for each spin-off i at discrete time t_j, $j = 1, 2, \ldots$, given survival until then is formally defined as

$$h_{ij} = 1 - \exp\left\{-\exp\left[\gamma(t) + X_i(t)'\beta + \log\left(\varepsilon_{ij}\right)\right]\right\}, \quad (1)$$

where h_{ij} is the hazard rate of spin-off i after surviving for exactly j years; $\gamma(t)$ is a set of yearly duration dummies; $X_i(t)$ is a vector of time varying and invariant variables expected to impact spin-off survival; β is a vector of unknown parameters to be estimated, and ε_{ij} is an error term that includes a Gamma distributed random variable with unit mean and variance v.

Vector $X_i(t)$ includes an indicator variable for the type of spin-off (pushed versus pulled) and the main start-up conditions of interest: (i) the geographic proximity to the PF; (ii) the share of co-workers hired at entry and their human capital (education, age, and tenure in the PF); and (iii) founders' general and specific human capital (education, age, years of business ownership experience, and industry-specific experience). We also control for several firm-level and industry-level characteristics, in addition to macroeconomic conditions.

We then apply the novel multivariate decomposition technique for hazard models developed by Powers and Yun (2009) and Powers et al. (2011), to better understand the link between pushed and pulled spin-offs' hazard gap and their different start-up conditions. Formally, the method allows the decomposition of the overall observed difference between pushed and pulled spin-offs' hazard rates ($\overline{h_{PS}} - \overline{h_{PL}}$) into a component E reflecting differences in their endowments, and a component C representing differences in the effects of these endowments (i.e., differences in the returns, coefficients, or behavioral responses), as follows:

$$\overline{h_{PS}} - \overline{h_{PL}} = \left\{\overline{F\left(X'_{PS}\beta_{PS}\right)} - \overline{F\left(X'_{PL}\beta_{PS}\right)}\right\} + \left\{\overline{F\left(X'_{PL}\beta_{PS}\right)} - \overline{F\left(X'_{PL}\beta_{PL}\right)}\right\} = E + C \quad (2)$$

where the subscripts *PS* and *PL* denote, respectively, pushed and pulled spin-offs.

Table 1
Comparative survival rates of pushed and pulled spin-offs.

Years since entry	Pushed spin-offs	Pulled spin-offs
1	0.9806	0.9738
5	0.8670	0.8310
10	0.7220	0.6820
15	0.6162	0.5753

Table 2
Descriptive statistics (mean values, $N = 127,496$).

	Pushed spin-offs	Pulled spin-offs
Proximity to the PF		
Same location (municipality) (%)	0.752	0.692
Co-workers at entry		
Share of co-workers (%)	0.256	0.095
Tenure in the PF (months)[a]	54.86	48.08
Schooling years[a]	6.112	6.650
Average age (years)[a]	35.51	33.69
Human capital of the BO(s)		
BOs' age	37.46	35.65
Schooling years	7.338	8.040
2d-industry experience (years)	3.762	3.771
Entrepreneurial experience (years)	1.630	1.210
Firm-level control variables		
Start-up size (log no. employees)	1.492	1.180
College workers (%)	0.051	0.083
Urban location (%)	0.380	0.392
Number of BOs	1.645	1.391
Industry-level control variables		
Minimum efficient scale (no. employees)	3.851	3.602
Industry growth (%)	0.030	0.037
Churn rate (%)	0.220	0.224
Primary sector (%)	0.018	0.011
Manufacturing (%)	0.251	0.184
Energy and construction (%)	0.179	0.145
Services (%)	0.553	0.661

[a] Mean values for the sub-sample of spin-offs hiring at least one co-worker. Minimum efficient scale: median number of employees in the 2-digit industry in each year. Industry growth: annual percentage change in 2d-industry employment. Churn rate: (Entries + Exits)/Total number of firms in the 2d-industry, by year.