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Spin-out activities in the wake of mergers and acquisitions: Are employees pushed or pulled into entrepreneurship?

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Abstract

This study investigates the relationship between mergers and acquisitions (M&A) and spin-out activities in human capital-intensive service sectors. Results from the application of a negative binomial estimator to data on 7 684 firms during the time period 2000-2009 confirm that the number of spin-outs spawned by a specific incumbent increases following an M&A ? albeit with a lag of two years and only for within-country M&As. We demonstrate that this effect is partly caused by M&As lowering the average barriers of leaving the current employment (i.e. being associated with general deterioration of working conditions). Our results furthermore provide support for the notion of M&As as a source of new entrepreneurial opportunities, which are first and foremost accessible by employees directly affected by M&As.

New firm formation in the wake of mergers and acquisitions: Are employees pushed or pulled into entrepreneurship?

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ABSTRACT

This study investigates the relationship between mergers and acquisitions (M&A) and spin-out activities in human capital-intensive service sectors. Results from the application of a negative binomial estimator to data on 7 684 firms during the time period 2000-2009 confirm that the number of spin-outs spawned by a specific incumbent increases following an M&A – albeit with a lag of two years and only for within-country M&As. We demonstrate that this effect is partly caused by M&As lowering the average barriers of leaving the current employment (i.e. being associated with general deterioration of working conditions). Our results furthermore provide support for the notion of M&As as a source of new entrepreneurial opportunities, which are first and foremost accessible by employees directly affected by M&As.

1. INTRODUCTION

Mergers and acquisitions (M&As) are identified as a central mechanism of market based economies. As demonstrated by Williamson (1968), a horizontal merger or acquisition may increase economic efficiency if it allows for the exploitation of previously unutilized economies and scale and scope which may well be greater than the efficiency losses incurred by the merged firm's increased market power. Furthermore, M&As potentially affect long-term economic development through transforming the conditions for industry-wide level innovation activities, but the accumulated evidence suggests that the net impact is subject to a number of contingencies (Cassiman & Colombo, 2006; Cloudt et al., 2006). In this paper, we explore an additional route through which M&A activity may affect the evolution of an industry: through affecting the conditions for entrepreneurial activity among employees of the involved firms.

Two main arguments are considered. First, we suggest that mergers and acquisitions may increase employees' transition to entrepreneurship by lowering the general barrier to job mobility. Problems of acculturation after a merger (Larsson & Lubatkin, 2001) and reduced fit between individual and organizational characteristics may lead to a perceived deterioration of career opportunities (Haveman & Cohen, 1994), and thereby influence employees' perceived value of staying employed. In other words, we note that the average opportunity costs for entrepreneurship for employees can be expected to be reduced by M&A activity.

Second, we draw on recent research inspired by evolutionary theory which suggests that M&As pave the way for the creation of new entrepreneurial opportunities. In post-merger processes, consolidation of activities often lead firms to abandon smaller segments which are seen as strategically unaligned in order to focus on markets and products where significant economies of scale and scope can be realised (Gugler et al., 2003; Luksha, 2008). M&As can thus be conceived as creating room for niche markets and as creating novel opportunities which may be identified by Kirznerian entrepreneurs. Such opportunities are first and foremost identified by individuals with first-hand information about pre-merger activities, i.e. by employees of the merged firms. Parallel arguments suggests that M&As can be expected to also drive entrepreneurship of a Schumpeterian nature. In particular, disagreement within a firm on the nature and potential of opportunities, or miss-match between an opportunity for new business and the incumbent's general strategy and existing line of products have been identified as important drivers of spin-out activity (Klepper & Sleeper, 2005; Klepper & Thompson, 2010). As M&As typically involve and bring about shifts in strategy, such tendencies can be expected to be reinforced in their wake.

In line with both sets of arguments above, empirical results have verified that the rate of spin-out¹ formation increases following M&As (see review in Klepper, 2007). This evidence is, however, primarily made up of studies of typical "high-tech" sectors in the emergent phase. In this paper, we investigate whether M&As are associated with increased spin-out activity also in a wider set of service sectors, including "low-tech" human-capital intensive services. We also qualify the analysis by developing and empirically exploring the parallel arguments of a "pull"-effect according to which M&As create entrepreneurial opportunities and a "push" effect according to which M&As reduce workers' reluctance to leave their existing job.

These two arguments offer alternative explanations for why spin-out activity increases after an M&A and considerably different implications. If the average impact of M&As on opportunity costs is negative, this may render the opportunity creation hypothesis unnecessary

¹ In what follows, we use the term spin-out in reference to a new firm founded by one or several employees of an incumbent firm, irrespectively of whether the incumbent is actively contributing to, actively opposing or passively neutral to the formation of a new firm.

to explain the relationship between M&As and the spawning of spin-outs. If, on the other hand, the average impact is positive, M&As may be more important for opportunity creation than suggest by previous studies.

Empirically, we investigate the spawn-rate of spin-off firms from Swedish firms during the time period 2000-2009 applying negative binomial regression. The data consists of 12 587 observations including 7 684 unique firms and 1 315 M&A operations. Acknowledging that an observed relationship between M&As and spin-out activity may be partly biased by unobserved industry-level developments, we control for changes in industry concentration and (revealed) entry conditions which are associated with both the occurrence of M&As and the frequency of spin-out activity. Our results confirm that the number of spin-outs spawned by a specific incumbent increases following an M&A, albeit with a delay of two years.

2. THEORETICAL CONTEXT

We consider the decision of individual utility-maximising employees' to leave their current job to engage in entrepreneurial venturing. The utility associated with the current job for individual i at time t is increasing in reservation wage w_{it}^r . The benchmark used for assessing an individual's reservation wage is all other labour market opportunities available to the individual, where engaging in new firm formation is but one of many options. The utility associated with leaving the current job to engage in such a process is increasing in the level of entrepreneurial opportunity θ_{it} of the most attractive business idea known to the individual at time t . In a discrete time setting, an individual's probability η to enter entrepreneurship in period t is given by

$$\eta_{it}^1 = f(\theta_{it} / w_{it}^1) + \varepsilon_{it} \quad (1)$$

if the individual is laid off in period t and

$$\eta_{it} = f(\theta_{it} / w_{it}^r) + \varepsilon_{it} \quad \text{otherwise.} \quad (2)$$

where f is a function increasing in all arguments and ε_{it} represents individual idiosyncrasy related to the preference for self-employment. The level of w_{it}^r in equation 2 depends on current job satisfaction, which is affected by the individual's current wage, but also by non-pecuniary aspects such as the match between individual abilities and preferences on the one hand and job content on the other. The reservation wage is furthermore affected both by the current situation and by the individual's expectations on future career opportunities from the present position. The corresponding variable w_{it}^1 in equation 1 represents the reservation wage of the most attractive offer of a new position in paid employment. The size of θ_{it} is evaluated by the individual given his or her abilities, prevailing (and expected) industrial conditions and the nature of the idea.

For a firm with N_{jt} employees laying off l_{jt} employees during the period, the expected number of spin-outs S_{tj} for firm j is given by

$$S_{tj} = \sum_{i=1}^{N_{jt}-l_{jt}} \eta_{it} + \sum_{N_{jt}-l_{jt}}^{N_{jt}} \eta_{it}^l \rightarrow \quad (3)$$

$$S_{tj} = \sum_{i=1}^{N_{jt}-l_{jt}} \left(f\left(\frac{\theta_{it}}{w_{it}^r}\right) + \varepsilon_{it} \right) + \sum_{N_{jt}-l_{jt}}^{N_{jt}} \left(f\left(\frac{\theta_{it}}{w_{it}^1}\right) + \varepsilon_{it} \right) \rightarrow \quad (4)$$

$$S_{tj} = (N_{jt} - l_{jt}) \times f\left(\frac{\theta_{jt}}{w_{jt}^r}\right) + l_{jt} \times f\left(\frac{\theta_{jt}}{w_{jt}^1}\right) + \mu_{jt} \quad (5)$$

where w_{jt}^r and θ_{jt} can be thought of as firm-averaged reservation wages and entrepreneurial opportunities and μ_{jt} represents the average preference for entrepreneurship among the

employees of firm j . The expected number of spin-outs increases in w_{it}^1 which for simplicity is assumed to be unaffected by specific M&A activities and which we will therefore not consider further in this paper. In the remainder of this section, we discuss how M&A activity affects the other three variables which affect the level of spin-out activity: l_{jt} , w_{jt}^r and θ_{jt} .

2.1 Working conditions in post-merger and acquisition firms

Achieving operational synergies between the merging entities is a common objective for post-M&A integration processes (O'Shaughnessy & Flanagan, 1998). For example, Conyon et al. (2002) reported an average employment reduction of 8% for unrelated mergers and 19% for related mergers from a study of 442 UK mergers over the period 1967-1996. It is plausible to expect that the variable l_{jt} increases in periods following M&As, and that this reduction in the opportunity costs of entrepreneurship causes an increase in spin-out activity.

Through perturbing the working environment of the employees, an M&A can be considered as a potential opportunity cost lowering factor also for many employees who are not directly laid off. The job characteristics theory (Seo & Hill, 2005) associates an M&A with a deterioration of the working environment and a retrograding in employees' perception of work satisfaction. In addition to frustration and disappointment caused by firm policy shifts following an M&As, employees sometimes experience a change in the fundamental relationships between the workers and the firm such as the disruption of psychological contracts as well as an interruption of the relationships and ties established among the colleagues (Newman & Krzystofiak, 1993). What follows these changes is a disruption of the loyalty and the spreading of the feeling of insecurity and unsafety among the employees of the firms.

The reasoning above suggests that independently of the motive for an M&A, hostile or friendly, the employees find themselves in a situation where the psychological and work environment impact of the organizational changes put parts of the work force ill at ease. Hence, the changes introduced by an M&A imply an increase in the reservation wage of the current job, in other words a reduction of the opportunity costs of entrepreneurship. We should, as a consequence, observe increased employment turn-over – also in the form of increased firm formation activity among employees (Amit et al., 1995).

Hypothesis 1a: Merger and acquisitions increases the firm level reservation wage level

Hypothesis 1b: An increase in firm level reservation wage leads to increased spin-out activity

2.2 Mergers and acquisitions as a source of entrepreneurial opportunities

The concept of entrepreneurial opportunities can be traced back to Austrian economics, where it is associated with entrepreneurial acts in terms of the formation of new ventures. Hayek (1945) recognize the importance of timing and location for exclusive information and knowledge of the conditions of a market allowing the agents to detect, exploit and thereby eliminate market inefficiencies. While, similar to Hayek, opportunities are treated as exogenous by Kirzner (1973, 1997), kirznerian theory assigns a greater weight to the capacity of the agents in detecting and evaluating opportunities. Since Schumpeter (1911) connects his analysis of entrepreneurship strongly to the concept of innovation, the view of the entrepreneur as directly involved in the creation of opportunities is often referred to as "Schumpeterian". However, this interpretation of Schumpeter's entrepreneur has been criticized, e.g. by Witt (2002) who claims that the opportunities are still pre-supposed just that in this specific case, entrepreneurs detect opportunities that are outside the market and the price system.

In recent research, M&A activities have been suggested as a particularly interesting source of entrepreneurial opportunities (Buensdorf, 2007). Despite typically perceived as making entry into the industry or industries affected by merger less attractive, due to the merged firm's new potential ability to exploit economies of scale and scope, M&As should also be thought of as affecting the potential for both Kirznerian and Schumpeterian entrepreneurship. Corporate restructuring and re-orientation in post-M&A processes may create room for new forms of specialization along the value chain. For example, a newly merged firm may choose to abandon or divest selected business segments in order to achieve focus (Capron et al., 2001; Friberg & Romahn, 2012; Kaplan & Weisbach, 1992), to avoid overlaps in assets (Chastain, 1987) and to comply with antitrust policies. The creation of entrepreneurial opportunities may consequently be analyzed as an externality of M&As.

M&As can be expected to generate new entrepreneurial opportunities on an industry-wide level, in particular by creating room for niche markets. There are, however, reasons to believe that opportunities will be strongly concentrated to employees of the merging firms. As insiders, employees are likely to have acquired knowledge and experience which make them better positioned to identify and act on entrepreneurial opportunities generated in post-merger processes (Chastain, 1987). Employees may be given formal offers to spin out as a merged firm undertakes divestitures of an asset or an activity (Curran et al., 2012). Such divestitures can take the form of regular sell-offs, but also be pursued through liquidation, management buy-out or through the creation of corporately controlled spin-offs (Hamilton & Chow, 1993). However, it may be even more common that employees themselves are motivated by changed priorities in the merged firm to engage in entrepreneurship in order to exploit business opportunities which they find no longer fits with their employer's agenda.

2.3 The disagreement factor

The fusion of ventures brings together organizational units with different activities, objectives, culture, and talent sets. Re-orientation of strategic objectives, possibly including changes in management may create a mismatch between individual aspirations of the employees and firm management. As a consequence some employees may choose to depart from the firm to form their own firms, seeking to exploit what they perceive as an entrepreneurial opportunity (Henderson & Clark, 1990; Klepper & Sleeper, 2005; Tushman & Anderson, 1986). For example, innovators in the employ by incumbents may furthermore be spurred to commercialise their ideas in the form of new ventures, if these ideas are not in line with the strategic orientation of the merged firm (Pakes & Nitzan, 1983; Christensen, 1993; Cassiman & Ueda, 2006).

Klepper & Thompson (2006) show how disagreement will lead to spin-off activity even in situations where the employees have no intention to dupe the employer by concealing discoveries that they were paid to do and the firm provides adequate compensation for discoveries made by the employees. In Klepper and Thompsons' disagreement model, the choices of a firm are described as the sum of weighted opinions relative to the position and the ownership share of the individuals. Employees with diverging perspectives that do not conform to their employer's ambitions choose to spin out as a means to fulfill their visions and business ideas. An important feature in the disagreement theory is overconfidence on behalf of the individuals.

In summary, we suggest that through changing industry structure and causing disagreement, M&As increase employee's average evaluation of the best available opportunity for entrepreneurship, resulting in an increased frequency of spin-out activity.

Hypothesis 2: In periods following mergers and acquisitions, the inflow of entrepreneurial opportunities available to employees increases.

3. METHODOLOGY

In order to test the hypotheses on the connection between M&As and spin-out formation outlined in the previous section, we investigate spawn rates of spin-out firms among service sector firms.

3.1 Analytical model

Our dependent variable Y_{it} is the number of new firms spawned from each firm i in each observed year t . Spin-outs are identified through observing shifts from paid-employment to self-employment of the firm's employees. The dependent variable is a count variable following a Poisson distribution with overdispersed variance suggesting the application of a negative binominal regression to our panel data. The following general model is applied:

$$Y_{it} = \alpha + \mu_i + \beta MA_{it} + \nu C_{it} + \lambda E_{it} \quad (6)$$

where MA_{it} is a dummy variable denoting occurrence of M&A activity of firm i in year t .

The vector C_{it} contains variables characterizing the focal firm. Firm size, measured as the number of employees of the focal firm in hundreds of individuals, is included here as the number of Spinouts should be expected to be strongly related to the number of individuals "at risk" of participating in new firm formation (see equation 5). Acknowledging that better performing firms and firms with larger stocks of knowledge have been identified as more frequently spawning spin-outs (Gompers, Lerner, & Scharfstein, 2005), turnover per employee is included along with two variables measuring the education level of the workforce. Here, the share of employees with longer and shorter tertiary education are included, with the share of employees with secondary education or lower as their highest degree forming the base case. Finally, a set of dummy variables are used to denote the Sector of activity, represented by a two-digit industry classification (NACE) code.

E_{it} contains two variables capturing time-varying industry- and year-specific conditions reflecting entry-conditions: an industry-level herfindahl index and the rate of new firm formation (number of entrants divided by number of incumbents) by industry and region.

3.2 Data

In our empirical analyses we use register-based employer-employee data from Statistics Sweden. This data has been used for a stream of previous studies on new firm formation and labour mobility (c.f. Anderson and Klepper, 2013; Delmar et al., 2011; Baltzopoulos and Broström, 2013). From firm-level data covering all Swedish firms over a nine year period (2000-2009), firms classified as belonging to the service sector are selected. A number of sectors where spin-out activities are either formally restricted by regulation (central banks, police activities, etc) or where entry barriers in terms of capital intensity are high (banking, ferry traffic) are excluded. A list of included sectors is found in the Appendix. We restrict our analyses to firms with more than 50 employees, yielding a total number of 12 587 observations on 7 684 unique firms.

Our firm data is merged with information on all working individuals in Sweden. We use these measures to identify spin-outs, which we define as newly established firms employing at least one individual who was in the previous year employed at the incumbent firm. A domestic M&A is registered as having taken place when more than 50% of the individuals working in a

firm in year t are identified as working for a different firm in year $t+1$. We also document the occurrence of cross-border M&As through ownership data; firms listed as foreign owned in year t and as domestically held in year $t-1$ are classified as having been acquired. Throughout the analysis, the variable MA is assigned the value 1 in all periods when either a domestic or a cross-border M&A has occurred and 0 otherwise. In this way, 1 315 mergers and acquisitions and 27 410 spin-outs are identified throughout the period.

In addition, industry specific indicators for each year are added to the final database, using two digit NACE-codes to identify industries. The industry indicators are the Herfindahl index and the rate of new firm entry. The latter variable is measured by industry and by region, utilizing the standard division of Sweden into 82 labour market regions based on observed commuting patterns.

Lastly, we use individual-level data to construct proxies for the firm level reservation wage w_{jt}^r , which together with a proxy for lay-offs l_{jt} capture the opportunity cost of entrepreneurship. For all individuals who between year $t-1$ and t leave firm j for a different paid employment, we calculate the difference in salary between years t and $t-1$. The arithmetic mean of these differences across all individuals who leave employment at firm j to take employment in another firm (excluding, people who transition to self-employment) is calculated. This variable, named returns to job mobility, is used as our main proxy for firm-level reservation wage w_{jt}^r . For robustness check purposes, we also establish a related proxy, named wage cut job mobility, in the form of the percentage of all employees at firm j in year $t-1$ who are identified as having changed employer between year $t-1$ and t while accepting a reduction in yearly salary. The two measures are complementary, in that they correspond to two different types of changes to the attractiveness of employment. The first measure has the advantage that it provides a measure of how dramatic changes are across the firm, supposedly capturing the effects of extensive lay-offs and/or general deterioration of job satisfaction. The second measure, on the other hand, is intended to capture heterogeneous impact, where one group of employees is positively affected and another negatively affected by the firm-level development. Since positive and negative impact of M&As may well cancel each other out in terms of the firm-level arithmetic mean, the second measure Individuals older than 60 are excluded from all calculations above, to avoid confusing retirement with other reasons for accepting a lower wage when switching jobs.

The tables below provide descriptive statistics of our dependent and independent variables.

Table 1: Variables summary

Variable	Mean	Std. Dev.	Min	Max
Spin-out number	.9610	3.375	0	119
Employees of reference firm	2.30	7.622	0.50	329
M&A	.0551	.2097	0	1
Cross-border M&A	.01217	.1096	0	1
Size difference	32.89	367.1	0	13444
Turnover of reference firm	2784	6731	-951.9	688795
Distance	1.359	20.27	0	903.1
Activity match	.0347	.1820	0	1
less than 2 years post-secondary per employee	.2017	1.740	0	267
More than 2 years post-secondary per employee	.2342	1.440	0	188
Herfindahl index	.008343	.0218	.0001885	.2125
Industry rate of new firms	.1933	.0752	0	.8413
Returns to job mobility	-.8790	.2415	-11.911	8.269
Foreign owned firms	.2840	.4510	0	1

4. RESULTS

In order to test hypothesis 1a, we first estimate a model with our measure of returns to job mobility as the dependent variable, using fixed effects OLS model estimation. Table 2 reports the results.

Table 2: Firm-level model of the returns to job mobility

	Model 1
Variable	Coefficient estimate (standard error)
M&A	-0,0858 (0,1261)
L1.M&A	-0,117* (0,048)
L2 M&A	-0,1079* (0,0499)
Cross-border M&A	0,0337 (0,1075)
L1. Cross-border M&A	0,0025 (0,0920)
L2. Cross-border M&A	0,0295 (0,1044)
Employees of reference firm	-0,038** (0,0146)
F1. Employees of reference firm	0,041** (0,015)
Turnover per employee of reference firm	-2,012 (9,533)
share of staff with shorter post-secondary education	-0,028 (0,025)
share of staff with longer post-secondary education	0,0805* (0,034)
Year dummies	Included
Sector dummies	Included
_cons	-1,739 (0,067)

** : Coefficient significant at a 1% level

* : Coefficient significant at a 5% level

The significantly negative estimate on the M&A-dummy lagged two periods provide support for hypothesis 1a, with the important qualification that negative effects on employees'

satisfaction with their current employment are materialised first two years after the occurrence of a merger or an acquisition.

We next turn to our main analysis, concerning hypotheses 1b and 2. Using firm-level panel data on the number of spin-outs spawned yearly, we deploy a negative binomial estimator on a model outlined in the previous section. A Hausman test suggests that firm-level fixed effect must be controlled for. Estimates are reported in Table 3.

Table 3: Firm-level model of spin-out spawn rates

Variable	Model 2	Model 3	Model 4
	Coefficient estimate (standard error)		
M&A	-0,4008 (0,2692)	-0,0884 (0,0705)	-0,1051 (0,0603)
L1.M&A	-0,1114 (0,0729)	-0,0719 (0,0517)	-0,0813 (0,072922)
L2M&A	0,1403* (0,0653)	0,1231* (0,0468)	0,1117* (0,0558)
Cross-border M&A	-0,0413 (0,1075)	0,1375 (0,1018)	0,1263 (0,1075)
L1. Cross-border M&A	-0,1832 (0,1044)	-0,0254 (0,0925)	-0,1325 (0,1044)
L2. Cross-border M&A	-0,2568 (0,1114)	-0,1928 (0,1124)	-0,0644 (0,1146)
Employees of reference firm	0,0162** (0,0029)	0,0170** (0,0027)	0,0169** (0,0029)
Turnover per employee of reference firm	-0,0015 (0,00341)	-0,0018 (0,00352)	-0,0015 (0,00341)
share of staff with shorter post-secondary education	-0,0023 (0,03180)	-0,0116 (0,0316)	-0,0023 (0,03181)
share of staff with longer post-secondary education	0,0009 (0,02649)	0,0070 (0,02642)	0,0009 (0,02647)
Herfindahl index		1,679 (1,499)	1,754 (1,425)
Industry rate of new firm entry		0,2752 (0,5116)	0,3127 (0,5109)
Returns to job mobility			-0,0430* (0,0185)
L>Returns to job mobility			-0,0449* (0,0187)
L2>Returns to job mobility			-0,0171 (0,0178)
Year dummies	Included	Included	Included
Sector dummies	Included	Included	Included
_cons	1,319 (0,361)	1,271 (0,351)	1,421 (0,362)

** : Coefficient significant at a 1% level

* : Coefficient significant at a 5% level

The significantly negative estimates on the returns to job mobility in Model 4 imply that in periods where job switchers are best compensated for leaving the focal firm, spin-out activity

decreases. Estimates using our alternative variable wage cut job mobility provide similar results. We interpret this as follows: spin-out activity is positively related to the reservation job of the current employment. In estimations not reported above, we similarly find support for that M&As are on average associated with lay-offs, and that lay-offs on average increase spin-out activity. In these estimates, lay-offs are proxied by a reduction of net employment of the focal firm. Estimates on the “raw” effect of M&As remain largely unaffected by the inclusion of this extra variable to model 4.² We interpret these results as supporting the hypothesis 1b; a reduction in opportunity costs to leave to current employer leads to increase spin-out activity.

Model 2 demonstrates a positive association between M&As and spin-out frequency, albeit first after two years. Klepper & Sleeper's (2005) and Klepper & Thompsons' (2007) findings from the laser, automobile and semiconductor industries implying a correlation between M&As and spin-outs are thus confirmed in our study. This result is in line with Hypothesis 2, which suggest that M&As generate entrepreneurial opportunities. However, we suggest that in order to evaluate how well our results fit Hypothesis 1, further analysis is needed. Are there alternative mechanisms which link the occurrence of M&As and spin-out activity, which do not fit within the entrepreneurial opportunities framework? In the remainder of this section, we discuss two such mechanisms.

First, we note that M&As are more likely to occur in phases of industry consolidation (Schoenberg & Reeves, 1999), in the wake of technological change and during periods of economic expansion (Lambrecht, 2004). These conditions are clearly also conducive for spin-out activities. While general entry levels can be expected to go down as industries are consolidated and competitions hardens, niche creation will increase, off-setting some if not all of this disadvantage to spin-out entrants. Intensified technological change and an increased rate of economic expansion is generally conducive for entry. We could therefore expect to observe parallel increases in M&A and spin-out activity. Industry dynamics thus provide a set of alternative, non-causal arguments for a temporal linkage between the occurrence of M&As and the spawning of spin-out firms. In order to investigate these relationships, we introduce industry-level controls in Model 2. We have also investigated the relationship between spin-out activity and M&A activity both on the firm level (by extending Model 2) and on the industry-level (by aggregating all data to the industry level) within a lag structure of +/- two years. These results, which are available upon request, give no indications that M&As are associated with spin-out activity. Together with the insignificant estimates on industry level variables in Model 2 (and Model 3), this implies that simultaneity issues are limited and that entrepreneurial opportunities generated through M&As do not manifest industry-wide, but are chiefly available to the concerned employees.

Second, the relationships described by Hypotheses 1a and 1b constitute an alternative linkage between M&As and spin-out activity. However, the inclusion of measures for changes in opportunity costs and changes in industry structure in Model 4 does not remove the “raw” effect of the occurrence of an M&A.

We are interpreting the outcome of this exploratory analysis as seemingly confirming the interpretation stated in Hypotheses 2 of M&As as generating externalities in the form of entrepreneurial opportunities. In other words: while we have shown that M&As to some

² The fact that M&As as expected is found to affect both our proxies for the opportunity costs of entrepreneurship (lay-offs, as measured by the net employment change, and the reservation wage, as measured through the returns to job mobility) means that the corresponding estimates of model 4 may be affected by multicollinearity. We note however, that coefficient estimates are relatively similar when including only one of the estimates. In particular, the estimate for M&A in model 4 is not markedly different from estimates in models 2 and 3).

extent “pushes” people into entrepreneurship by deteriorating working conditions for involved employees, it seems that the dominating mechanism through which M&As are associated with spin-out activities is that entrepreneurial opportunities are created, “pulling” employees into entrepreneurship.

Disclaimer

This discussion will be developed during the spring of 2015, among other things describing endogeneity-related issues.

5. CONCLUSION

Mergers and acquisitions are key activities in theories of industrial evolution, through which consolidation and restructuring take place. In this paper, we discuss how M&As affect the frequency of spin-out activity by changing the conditions for entrepreneurship among employees. Our analysis offers three contributions.

First, we show that the empirical regularity that spin-outs flourish in the wake of M&As extends from the context of emerging high-tech industries such as lasers, semiconductors and disk-drives (Klepper and Thompson, 2007) to a wider setting of labour intensive services. In this setting, we identify a two-year delay between a fusion of two or more existing firms and an increase in spin-out activity. This observed result suggests that the response to M&A in form of shift in employment requires an adaption period indicating that the decision to leave the firm, in form of an exit through a spin-out, is not taken immediately at the announcement of an M&A as might have been expected considering the negative impact of such an announcement on employees documented by Souder & Chakrabarti (1984), Lindholm (1994) and Hussinger (2007). We also establish that this effect is only in place for domestic M&As.

Second, we demonstrate that M&As on average reduces the opportunity costs of entrepreneurship for employees, and that this accounts for part of the observed linkage between M&As and spin-out activity. This argument offers an alternative explanation for why spin-out activity increases after an M&A – through deterioration of local labour conditions rather than through the creation of novel opportunities – than the one offered by i.e. Klepper and colleagues, and one with considerably different implications.

Thirdly, we show that also when controlling for the opportunity cost effect and for industry factors which may introduce simultaneity between M&As and increased spin-out activity, a strong temporal linkage between the two remains. We are thus able to substantiate the claim that M&As generate new entrepreneurial opportunities, by creating room for niche markets (Luksha, 2008) and/or by inducing disagreement inside the firm (Klepper & Sleeper, 2005; Klepper & Thompson, 2010).

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Appendix: List of sectors included

Hotels and restaurants

Retail

Transportation by bus, taxi, truck

Logistics services

Travel arrangements

Financial services

Real estate services

Consulting

R&D

Architecture

Advertising and PR

Human resource services

Design

Education

Health care

Social services

Waste treatment

Media

Artistic activities

Sports activities

Hair dressing and beauty salons

Funeral services

Other service activities

Appendix: Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Spin-out number	1.0000														
(2) Employees of reference firm	0.5106	1.0000													
(3) M&A	0.1498	0.1569	1.0000												
(4) Size difference	0.4099	0.4861	0.4049	1.0000											
(5) Turnover difference	0.2655	0.3456	0.3322	0.7088	1.0000										
(6) Turnover of reference firm	-0.0138	-0.0095	0.0004	-0.0070	0.0581	1.0000									
(7) Distance	0.0234	0.0395	0.2974	0.1076	0.0775	0.0418	1.0000								
(8) Activity match	0.1310	0.1353	0.8627	0.3506	0.2713	0.0074	0.2681	1.0000							
(9) less 2 yr post-secondary per employee	0.0057	-0.0083	-0.0001	-0.0032	-0.0023	0.0763	0.0295	0.0012	1.0000						
(10) more 2 yr post-secondary per employee	0.0080	-0.0116	0.0072	-0.0051	-0.0051	0.0589	0.0076	0.0002	0.9277	1.0000					
(11) Herfindahl index	0.0385	0.1169	-0.0051	-0.0034	-0.0006	-0.0213	-0.0086	-0.0088	0.0026	0.0097	1.0000				
(12) Industry rate of new firms	0.0258	0.0015	-0.0290	-0.0132	-0.0211	-0.0790	-0.0309	-0.0256	0.0142	0.0235	0.1598	1.0000			
(13) Cross border M&A	0.235	0.014	0.0196	0.0152	0.0145	0.0016	-0.0019	0.019	0.0504	0.0437	0.0057	-0.0196	1.0000		
(14) Gains from employment shift	0.0190	0.0183	-0.0041	0.0073	0.0103	0.0214	-0.0048	0.0022	-0.0017	0.0044	-0.0102	0.0539	-0.012	1.0000	
(15) Foreign owned firms	0.0256	0.0379	0.0375	0.0251	0.0224	0.0865	0.0197	0.0287	0.0155	0.0092	0.0148	-0.0270	0.1826	-0.0194	1.0000