DO DIRECT OR INDIRECT RELATIONS BETWEEN INCUMBENT FIRMS AND CORPORATE SPIN-OFFS AFFECT THE PERFORMANCE OF SPIN-OFFS AND TO WHAT DEGREE?

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ABSTRACT
This article sets focus on the performance of corporate spin-offs. The existing literature agrees that corporate spin-offs perform better than independent start-ups. However, systematic evidence on the subject still seems elusive. We therefore set out to review articles that specifically address the performance of corporate spin-offs compared to independent spin-offs. Furthermore, we compare the performance between different types of spin-offs, because spin-offs are not a homogeneous group. We distinguish between spin-offs that receive resource support from their incumbent firms and spin-offs that do not receive support. A Danish sample of 325 companies (spin-offs and independent firms) is used to show that spin-offs in general perform better than independent spin-offs and further, that in between the group of spin-offs (spin-offs with direct or indirect relations with incumbent firms) there also exists performance differences. Spin-offs with indirect relations to an incumbent firm perform better than spin-offs with direct.

1. INTRODUCTION
In the literature of spin-offs, particularly corporate spin-offs, researchers tend to agree that corporate spin-offs perform better than other new start-ups that are not related to an incumbent firm (Mustar, 2006). Spin-offs perform better as they manage to connect old structures and routines with new structures and ways of thinking (Wallin & Dahlstrand, 2005). As such, spin-offs are carriers of parental heritage (Klepper & Sleeper, 2005), in the sense that spin-offs inherit knowledge through their founders (Agarwal et al., 2004) which generally gives them a competitive knowledge advantage compared to other new start-ups (Parhankangas & Arenius, 2003). Spin-offs are therefore commonly recognised as independent entities that outperform other types of new start-ups due to their relations to an existing firm (Audretsch et al., 1999; Eriksson & Kuhn, 2006). This observation is confirmed by the extensive literature review conducted by Tübbe et al. (2004). The authors find that corporate spin-offs combine a rapid growth with a considerably lower failure rate than other types of start-ups (Tübbe et al., 2004).

In this article, it is discussed whether or not this seemingly agreed-upon understanding of spin-offs’ performance actually can be documented, and if so what characterises those corporate spin-offs that appear to perform better. This is done as systematic evidence on the subject still seems elusive (Shane & Stuart, 2002). Reasons that systematic evidence might be week is that literature on corporate spin-offs is sparse, heterogeneous subjects are discussed and corporate spin-offs are defined very differently (Tübbe et al., 2004). Therefore, in the first part of the article it is investigated how different authors address the issue of corporate spin-offs’ performance. This is done though a literature review of articles that narrowly address the performance of corporate spin-offs. Earlier research has predominantly addressed the performances of parent firms spinning out new spin-offs (see for instance Woo et al., 1992; Allen, 2001; or Alli, Ramirez & Yung, 2001; Wallin & Dahlstrand, 2005). Due to the focus of this paper, the literature review will look at recent studies that primarily discuss the performance of spin-offs compared to different types of spin-offs or other new start-ups.
In the literature review, it is also considered what types of relations that characterise the affiliation between the corporate spin-offs and their incumbent firms. This distinction is not always something researchers in the field have focused on when reporting performance results. However, some of the most recent research in the field of corporate spin-offs suggests that this might be a central distinction as the performance of corporate spin-offs seems to depend upon this (Wallin & Dahlstrand, 2005, Parhankangas & Arenius, 2003). The distinction is important as spin-offs with a direct affiliation to their incumbent firms have easier access to resources than spin-offs with no access, which might influence how the different types of spin-offs perform (Parhankangas & Arenius, 2003). For instance, Dahlstrand (1997) and Wallin & Dahlstrand (2005) distinguish between sponsored and not sponsored spin-offs, making the argument that sponsored spin-offs may benefit more from the resource synergies that a mutual affiliation might bring than spin-offs with no relation to their incumbent firms. Chesbrough (2003) makes a similar distinction between the type of affiliation that exists among spin-offs and its parent firm. Chesbrough distinguishes between voluntarily and involuntarily established spin-offs making a similar point as Wallin & Dahlstrand that some spin-offs are established with parental support and others are not. Those spin-offs that are involuntarily established by the incumbent firm are not receiving any support. In addition, other distinctions flourish when looking at university spin-offs such as planned/organised versus unplanned/spontaneous spin-offs (Dyck, 1997; Steffensen et al., 2000), or formal versus informal links (Hindle & Yencken, 2004), or again between direct or indirect relationships (Shane & Stuart, 2002). All in some manner discuss the relation between the incumbent firm and the spin-off; however they use different terminology and have varying focus.

2. DEFINITIONS OF CORPORATE SPIN-OFFS AND DIRECT OR INDIRECT RELATIONS

Most earlier research on spin-offs has focused on spin-offs from universities (Wallin & Dahlstrand, 2005), defined as spin-off firms, formed by academic staff taking research out of the laboratory to start their own commercial firms (Löfsten & Lindehöf, 2005). Spin-offs from private corporations have been given much less attention (Dahlstrand, 1997; Wallin & Dahlstrand, 2005; Klepper, 2001). In the article, spin-offs from the private sector are generally defined as new firms founded by ex-employees that exploit skills they acquired in their prior workplace; skills based on related competences, and resources inherited from the former workplace (Klepper, 2001; Klepper & Sleeper, 2005). As such, we distinguish between university and corporate spin-offs as suggested by Löfsten & Lindehöf (2005). Naturally, there can also be spin-offs from organisations other than universities and corporations, which are called institutional spin-offs by Dahlstrand (1997). The definition of corporate spin-offs, which this article sets focus on, includes both divestments and entrepreneurial spin-offs which is in line with the typology recommended by Wallin & Dahlstrand (2005). In a divestment spin-off, the majority of the voting power is transferred from an existing legal entity to a new body or another firm whereas in an entrepreneurial spin-off there is usually no formal transfer of ownership rights (Parhankangas & Arenius, 2003). An entrepreneurial spin-off most often is established when an ex-employee starts a firm on his or her own.

A direct relationship between a corporate spin-off and an incumbent firm is defined as the existence of an official and supportive collaboration between one of the former employees and the management of the incumbent firm (Shane & Stuart, 2002). Perhaps the incumbent firm supports the spin-off financially, or with technological knowledge and expertise, or by being in the spin-off’s board of directors. The complete opposite of a direct (official and supportive) relationship is a situation where an incumbent firm and a spin-off in no aspects cooperate with each other. The incumbent firm might not be interested in supporting the spin-off and/or the spin-off might have no interest in receiving any form of support from the management of the incumbent firm. Thus, the point made is that the existence of a direct relationship, no matter what small amount of support the corporate spin-off receives from the incumbent firm, might influence the performance of the spin-off and is therefore a relevant categorisation to take into notice when reporting performance results.

Our survey of 325 corporate spin-offs in Denmark confirms that it is important to distinguish between if the spin-offs are supported or not by the incumbent firms. Thus, the research points to a new possible research subject that might bring more nuances into the discussion of spin-off performance. The results indicate that the distinction between spin-offs having direct relations to an incumbent firm or not seem to have consequences for the performance of corporate spin-offs.

The remaining of the paper is structured in the following manner. Section 3 consists of a literature review of articles that addresses the performance of corporate spin-offs. In section 4 we look further into the
theoretical literature presenting arguments for and against the notion that spin-offs should perform better by getting support from an incumbent firm or not after they have been established as independent entities. Further, in section 5 we present our quantitative results. Finally in section 6 we discuss limitations in our research and in section 7 we conclude based on our findings.

3. THE LITERATURE REVIEW OF CORPORATE SPIN-OFFS

When conducting a literature review of the corporate spin-off field, it becomes evident that researchers are not always concerned or exactly define what types of relations the corporate spin-offs have to their incumbent firms. As a result, it is not easy to get an overview of which corporate spin-offs that perform better than other types of corporate spin-offs and other types of new-start-ups. The picture is very mottled and it gets obvious that researchers in the field of corporate spin-off have to be more specific about what types of spin-off they are concerned with when reporting performance results. Otherwise, it is very difficult to gain an overview of the different performance results that researchers report. One way to distinguish between different types of spin-offs is to consider what types of affiliation exist between the spin-offs and their parent firms.

In the following, we list seven researchers that have researched the performance of corporate spin-offs. The criteria for selecting the articles are the following three:

- The articles have to research corporate spin-offs. Most researchers have been interested in university spin-offs (Wallin & Dahlstrand, 2005).
- They further have to focus primarily on the performance of the spin-off independently of the parent firm. Most researchers interested in corporate spin-offs’ performance have measured this in relation to parent firms (Wallin & Dahlstrand, 2005).
- Moreover, the articles have to be based on relative larger sample sizes because the studies of corporate spin-offs mostly have been based on rather small unrepresentative samples (Eriksson & Kuhn, 2006).

Table 1: The performance results of corporate spin-offs

<table>
<thead>
<tr>
<th>Researchers and year of publication</th>
<th>Type of spin-off</th>
<th>Applied performance measures</th>
<th>Performance results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woo, Willard &amp; Daellenback (1992)</td>
<td>Examine 51 voluntary (=divestiture) spin-offs (page 435). Distinguish between related and unrelated divestitures (page 438)</td>
<td>Four performance measures were examined: 1) return on assets, 2) Market-to-book ratio, 3) Alpha coefficient (indicates deviations from the risk-adjusted expected market values of the firm) and, 4) growth in sales (page 439). Time period 2 years prior divestiture and 3 years ex post divestiture.</td>
<td>No gains upon divestiture can be found from a pre-divestiture to a post-divestiture period for all spin-offs. No significant change in performance is found for related spin-offs in the same period. But significant deterioration for the ROA measure can be found for unrelated spin-offs, but non-significant changes in performance for the other measures in the same period.</td>
</tr>
<tr>
<td>Michaely &amp; Shaw (1995)</td>
<td>Examine 37 voluntary (=divestiture) spin-offs (page 9)</td>
<td>12 performance measures are used (e.g. assets, change in assets, return on assets) (page 11). Time period 10 days, 60 days, first year and first two years.</td>
<td>Carve-outs have more employees and are more profitable than spin-offs. Moreover, both carve-outs and spin-offs underperform the market.</td>
</tr>
</tbody>
</table>
When observing the above table, it becomes evident that it is difficult to confirm explicitly that spin-offs without any doubt generally perform better than other new start-ups. Some research confirms this and other research not explicitly. The research done by Woo et al. (1992) shows that spin-offs, defined as divestitures, get no gains from divesting out from parent firms into autonomous entities. Further, the research by Michaela & Shaw (1995) shows that spin-offs, also defined as divestitures, do not perform better than other firms in the market. However, these results might be related to the fact that divestitures are defined in both articles as existing business activities, which are divested from a parent firm. Contrary the research done by Chesbrough (2003) and Wallin & Dahlstrand (2005) who understand divestitures as more innovative in that they are defined either as spillovers from R&D research or as a result of internal venture activities. Thus, divestitures in the Chesbrough and Wallin & Dahlstrand sense are more novel activities. The performance results of Wallin & Dahlstrand (2005) state that spin-offs have a higher probability to increase employee size than other new start-ups. Finally both Eriksson & Kuhn (2006) and Argawal et al. (2004) found that the survival rate of the spin-offs is better than other new start-ups. The
results have to be interpreted with care because Eriksson & Kuhn and Argawal et al. define spin-offs somewhat differently, i.e. spin-offs are 1) defined as either push (parent firm stopped its activities in the first year of spin-offs existence) or pull spin-offs (the parent firm still exists after a year) or 2) defined as entrepreneurial spin-offs of ex-employees. The results from Chesbrough (2003) and Sapienza et al. cannot be used to confirm that spin-offs perform better than independent start-ups because they compare performance in-between different spin-off types. As such Chesbrough concludes that spin-offs with more VC representation in their Boards perform better than spin-offs with inside incumbents in the Board. Further Sapienza et al. concludes that spin-offs which partially overlaps their incumbent firm’s knowledge base perform better than spin-offs with too little or too great an overlap.

What we can conclude from the above articles are in general:

- No standard definition exists of what spin-offs stand for. Even though researchers use the same terms, they understand them differently.
- Only few researchers distinguish between different types of spin-offs. For instance it is important to distinguish between spin-offs that have a high or low degree of novelty.
- Further, there is no standard for performance measures or discussion of how to measure and which then is the best measurements. For instance growth in number of employees does not have to be equal to growth in sales or return on assets.
- Most researchers measure the performance of spin-offs ex ante and ex post the divestiture. Either the researchers are interested in if the divesting results in higher performance, or if spin-offs performance depends on different types of divested spin-offs.
- Only a few studies look at the performance of spin-offs over a longer duration. Depending on which type of spin-offs the research focuses on, the duration might matter.
- Moreover there is still a tendency for researchers mostly to consider spin-offs’ performance from the incumbent firm’s perspective. Thereby only a few studies specifically measure spin-offs performance independent of the parent firms.
- Also, very few researchers are interested in entrepreneurial spin-offs.
- Almost none of the above researchers look at how the incumbent firms support the spin-offs ex post with tangible or intangible resources and how it affects the performance of spin-offs that get support or do not. Only Chesbrough (2003) considers this aspect as he investigates what effect Board support or financial capital support has on spin-offs’ performance.

In the next section, we look at the theoretical arguments for how incumbent firms’ supports of spin-offs can have a positive or negative affect on spin-offs’ performance.

4. POSITIVE AND NEGATIVE THEORETICAL ARGUMENTS

The explanation put forward for the better performance of spin-offs mostly concerns that former employees are more knowledgeable and more experienced because of their former jobs in incumbent firms which is knowledge that is very useful to draw upon when setting up a new firm (Sapienza et al., 2004). The reason behind the explanation however reveals different perspectives on what actually makes this an advantage. Some researchers point out that spin-offs inherit general technical and market-related knowledge that makes former employees perform better than other entrepreneurs (Klepper & Sleeper, 2005). Other researchers also mention that contacts to various business relations, such as customers and suppliers, are of evident meaning for developing successful products or getting into new markets (Eriksson & Kuhn, 2006; Mustar, 2006). Furthermore, some researchers are convinced that routines, relations, tacit knowledge concerning how to organise and management a new organisation inherited from an incumbent firm are crucial to the success of a new spin-off firm (Sapienza et al., 2004). Regardless of the varying explanation, a consensus seems to exist between some researchers in the field of corporate spin-off concerned that former employees who start up a new spin-off firm seem to be more robust than other types of entrepreneurs, as they can draw on experience and knowledge from former jobs. A first proposition therefore can be that:

P1: Spin-offs in general perform better than independent firms do.

The explanation behind the proposition that spin-offs in general perform better than independent firms do mostly draws on the resource-based perspective or the resource-dependence view (Parhankangas & Arenius, 2003; Mustar et al. 2006). However there exists opposite ways to argue for performance when looking at different types of spin-offs.
When looking at how different types of spin-off are argued to perform, the argument both exists for and against spin-offs having an official and supportive relationship to an incumbent firm. Concerning spin-offs with direct relations to incumbent firms, the argument is as follows: When parent firms and their spin-offs preserve a relationship, the spin-off may combine at the same time the advantages of being a small flexible firm and utilising on existing resources from the parent firm (Parhankangas & Arenius, 2003). Resources that can be of importance are for instance tangible resources, such as financial capital and physical assets (plant, equipment, stocks of raw material, etc.). Intangible assets could consist of reputation, brand image and product quality or personnel-based competences such as technical and organizational know-how (Nonaka & Nagata, 2000; Argawal et al., 2004). The parent firm can thus function as a buffer to shield the spin-off venture from the initial risks and hazards that have been identified as “liabilities of newness”. A spin-off’s survival and success therefore depends on its ability to acquire and maintain resources from its parent firm. A proposition therefore could be:

**P2: Spin-offs with a direct relationship with its incumbent firm have a higher performance than indirect spin-offs.**

Nevertheless, the argument can also be addressed from another perspective based on the same theoretical understandings: Too close a relationship to an incumbent firm might destroy the potential for creating a new knowledge base because the knowledge base of the spin-off becomes redundant in relation to the incumbent firm (Sapienza et al., 2004). Put in another way, new combinations of knowledge do not come up as no learning takes place. Too great an overlap with the incumbent firm therefore, can be argued hampers the discovery of new technologies, new ways of production and new marketing ways. With other words, the spin-off is lost in a resource trap – hindered by the inability of people to change their current way of thinking or behaving. An opposite proposition that can be drawn is therefore the contrary:

**P3: Spin-offs with an indirect relationship with its incumbent have a higher performance than spin-offs with direct relations.**

In the next section, the quantitative results from the Danish survey are presented to clarify the potential in the two propositions.

## 5. QUANTITATIVE SAMPLE

The two propositions are tested empirically based on Danish companies from a region called Vejle region registered in the period 2003-2005. Thus, the companies are between 1 and 3 years of age. The data we use emanate from The Central Business Register (CVR), which is a central register containing primary data on all businesses in Denmark, regardless of economic and organizational structure. CVR also covers both public and private businesses. Statistics Denmark constructs the CVR. The research is based on a questionnaire completed via telephone interviews. Of the 562 contacted companies 325 responded, leaving a respond rate on 57.8%. As the spin-off activities and relation to parent company can vary, three main industrial areas were researched 1) industries, 2) transportation, post and telecommunication and 3) real state and business services. With an equal distribution of responses between the three main industrial areas, the survey can be seen as representative for the spin-off activities taking place in the Vejle region. Of the 325 contacted companies 75 were located in the industries, 49 were sited in the transportation, post and telecommunication industry and, 154 were placed in the real state and business services industry. Taken together, 278 out of the 325 responded companies are still active (see table 2).

<table>
<thead>
<tr>
<th>Industries</th>
<th>Number of contacted firms</th>
<th>Number of responding firms</th>
<th>Number of active firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industries</td>
<td>148</td>
<td>86</td>
<td>75</td>
</tr>
<tr>
<td>Transportation</td>
<td>91</td>
<td>52</td>
<td>49</td>
</tr>
<tr>
<td>Real state and business service</td>
<td>323</td>
<td>187</td>
<td>154</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td><strong>562</strong></td>
<td><strong>325</strong></td>
<td><strong>278</strong></td>
</tr>
</tbody>
</table>

Note: The industries are defined in accordance to NACE codes.
69.5% of the responding companies from the three main industry areas states, in the questionnaire that the idea for the new firm is developed as a result of their former work at an incumbent firm. The central question used to distinct between new firms as either spin-offs or independent firms is; “Is it true that the idea for the new business you and your partners have established is a result of your or your partners former employment in another firm?”. As such, seven out of ten of the new firms established in the period of 2003-2005 in the Danish survey sample can be characterised as spin-off firms. It should be noted that the relative high spin-off activity is not isolated to the three industry areas; in that our definition of spin-off does not include that the spin-off activities have to be in the same industry as the parent workplace. This is similar to the definition used by Eriksson & Kuhn (2006) and contrary to the definition of spin-offs used by Klepper & Sleeper (2005). The numbers therefore only illustrate how many spin-offs have been established in the three industry areas, nothing can be said about which industries the parent firms operate in side.

To compare the above results with other similar quantitative samples, research shows that 8% of new high-tech firms in France can be identified as spin-offs, whereas 25% exist in Finland and 50% can be identified in Sweden (Tübke et al., 2004). The spin-off activities in the Danish sample are thus relative high. An important explanation for this result can be that the sample was not restricting to high-tech firms, but looking generally at spin-off activities no matter their use of technology.

**Number of spin-offs with direct or indirect relations to their incumbent firms**

When looking at the distribution of new established spin-offs in general in table 3, limited variance can be found between the three main industry areas. However, when we distinguish between spin-offs with direct relations to an incumbent firm (e.g. official and supportive relationship) and spin-offs with indirect relations to an incumbent firm, the rate of spin-offs with direct relations is higher in the Industries (47.8%) and Transportation industry (50.0%) than in Real State and Business Service industry (35.1%). The variance can be a result of many further categorisations under each main industry area, which may contain many different business areas. For instance if we look closer at the Real State and Business Service industry, this main industry area contains further categorisations where the lowest rate of spin-off activities takes place in the categorization called “Firm counseling”. Here the rate of spin-offs with direct relations to incumbent firms is rather low, in that only 25% have direct relations compared to other categorisations.

**Table 3: The distribution of spin-off firms on three industry categorisations**

<table>
<thead>
<tr>
<th>Industries</th>
<th>The rate of spin-offs compared with all new firms</th>
<th>The rate of spin-offs with direct relations compared with all new firms</th>
<th>The rate of spin-offs with direct relations compared with spin-offs with indirect relations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industries</td>
<td>69.7%</td>
<td>33.3%</td>
<td>47.8%</td>
</tr>
<tr>
<td>Transportation</td>
<td>75.0%</td>
<td>37.5%</td>
<td>50.0%</td>
</tr>
<tr>
<td>Real state and business service</td>
<td>67.8%</td>
<td>23.8%</td>
<td>35.1%</td>
</tr>
<tr>
<td>Sum</td>
<td>69.5%</td>
<td>29.1%</td>
<td>40.8%</td>
</tr>
</tbody>
</table>

Note: The industries are defined in accordance to NACE codes.

To compare the above results with similar quantitative samples, research shows (Ito, 1995) that 17.5% of new established firms on the stock exchange in Tokyo have direct relations to incumbent firms (e.g. official and supportive relationship), whereas only 1.3% have direct relations in the case of the New York Stock Exchange. Moreover, research conducted by Wallin & Dahlstrand (2005) shows that in the period of 1992-1996 in Sweden 28% of the initial public offerings (IPO) could be identified as spin-offs and further that 40% of those where spin-offs with direct relations to their incumbent firms. However, it is worth noticing that the research by Ito (1995) mainly refers to subsidiaries, and that the research done by Wallin & Dahlstrand (2005) mainly is concerned with spin-offs that include the transfer of rights from the previous owner/employer to the new firm. Our sample includes a much larger group of spin-offs than the research done by Ito and does not exclude spin-offs which do not receive any transfer of rights as in the Wallin & Dahlstrand research. Our understanding of spin-off activities is thus much broader.
Performance results for spin-offs with direct or indirect relations to incumbent firms and independent firms.

The performance data we can get from the sample is unique as we focus on the expected rather than the actual performance of newly started firms. This is due to the type of sample we use as the focus has been on newly established firms in the period from 2003-2005 without following them over a longer period.

The performance measures we use are the following:

- Measured in number of full time employees: The number of employees at present compared to how many employees you expect to employ in about a year?
- Measured in annual turnover: How is the annual turnover expected to be in the current financial year, compared to how the annual turnover is expected to be in the forthcoming financial year?
- Profit measurement: Do you expect your firm to yield a profit in the current financial year?

The chosen performance measurements are traditionally used when analysing the performance of firms in that they are simple outcome based on financial indicators that are assumed to reflect the fulfilment of the economic goals of the firm (Venkataraman & Ramanujam, 1986). However, because we use expected performance measures, our data is likely to be biased because the respondents interpret their own expected performance. The respondents do not report actual financial records.

The results from the below table 4 shows the expected performance of spin-offs in general compared to independent firms performance results. We use a Levene’s test to see if the equality of variances exists (the variance is not assumed), and a 2-tailed t test to determine whether the means are distinct. When comparing, the statistically significant result that come up is expected profit. The result for expected annual turnovers and expected growth in employees are not statistically significant. The results show that:

- Spin-offs in general expect the time from entrance to gain profit from the firm’s activities to be shorter than what independent firms expect.

Thus, it can be concluded that in relation to profit spin-offs in general perform better than independent start-ups when measuring how fast they expect to gain profit. However, an important remaining question is how well spin-offs, which to some degree are supported by their incumbent firms, perform in relation to spin-offs that are not supported by their incumbent firms.

Table 4: Expected performance differences between spin-offs (s) in general and independent start-ups (I)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Standard error mean</th>
<th>Sig. (2-tailed)</th>
<th>Mean difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of entrance to expected profit</td>
<td>186 (S)</td>
<td>-.09</td>
<td>.96</td>
<td>.07</td>
<td>.009</td>
<td>-.35</td>
</tr>
<tr>
<td></td>
<td>101 (I)</td>
<td>.26</td>
<td>1.1</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected annual turnover</td>
<td>175 (S)</td>
<td>.05</td>
<td>1.0</td>
<td>.07</td>
<td>.992</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>96 (I)</td>
<td>.05</td>
<td>1.1</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected growth in number of employees</td>
<td>189 (S)</td>
<td>.07</td>
<td>1.0</td>
<td>.08</td>
<td>.836</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>103 (I)</td>
<td>.05</td>
<td>1.0</td>
<td>.10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The results are tested for industry-effects and the 2-tailed t test is below 0.01 level.

When comparing the expected performance of spin-offs with direct relations to an incumbent firm with those spin-offs having indirect relations we also get statistically significant results. Here, we also use a Levene’s test to see if the equality of variances exists (the variance is assumed), and a 1-tailed t test to determine whether the means are distinct. Significant statistically results can be found on one performance measure concerning the expected annual turnover, see table 5. The results are not significant concerning expected profit but are almost significant when it concerns the expected growth in employees. The results show that:

- Spin-offs with direct relations in general expect lower annual turnover and lower growth in annual turnover than spin-offs with indirect relations.

- Further, there is a strong tendency for spin-offs with direct relations in general to expect fewer employees and lower growth in number of employees than spin-offs with indirect relations to incumbent firms.

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The results show that different relation to an incumbent firm, direct or indirect, affects the performance of spin-offs. A spin-off with direct relations can expect a low growth and employment rate over time as they might be too focused on the incumbent firm and not manage to gain new customers. Whereas spin-offs with indirect relations develop, offerings that is interesting for a broader customer group and therefore gets higher annual turnover and growth in number of employees.

Table 5: Expected performance differences between spin-offs with direct relations to an incumbent firm (SD) and spin-offs with indirect relations to an incumbent firm (SI)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Standard error mean</th>
<th>Sig. (1-tailed)</th>
<th>Mean difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of entrance to expected profit</td>
<td>104 (SI)</td>
<td>2.9</td>
<td>1.2</td>
<td>.12</td>
<td>.15</td>
<td>.20</td>
</tr>
<tr>
<td></td>
<td>41 (SD)</td>
<td>2.8</td>
<td>1.2</td>
<td>.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected annual turnover</td>
<td>98 (SI)</td>
<td>1.1</td>
<td>2.0</td>
<td>.20</td>
<td>.05</td>
<td>.25</td>
</tr>
<tr>
<td></td>
<td>38 (SD)</td>
<td>.66</td>
<td>1.4</td>
<td>.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected growth in number of employees</td>
<td>105 (SI)</td>
<td>1.1</td>
<td>2.3</td>
<td>.23</td>
<td>.06</td>
<td>.23</td>
</tr>
<tr>
<td></td>
<td>41 (SD)</td>
<td>.66</td>
<td>1.2</td>
<td>.18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The results are tested for industry effects and the 1-tailed t test is below 0.05 level.

The overall consequence of the result presented shows that it not just important to distinguish between spin-offs in general and other start-ups, but also important to distinguish between different types of spin-offs. An important distinction between spin-offs might be their relation to incumbent firms because this has strong implications for spin-offs performance as our sample shows.

### 6. LIMITATIONS AND FURTHER RESEARCH

This article should be seen as an attempt to bring more nuances into the research conducted in the field of corporate spin-offs and to address that it is necessary to become more specific about how different types of corporate spin-offs perform. The clarity is required if researchers in the field of corporate spin-offs want to develop theory and make managerial implications that can actually be used in practice.

The limitations in our sample concerns primary three aspects. First, we measure spin-offs’ performance over a short period. It may not be possible for some types of spin-offs, especially those high-tech spin-offs which are involved in research-intensive projects targeting broader markets, to perform well in a short period of time (Mustar et al., 2006). This might not either be the purpose of establishing these types of high-tech spin-offs in that they might develop a technology that needs time and patient cash flow because the technology is radical in nature and might transform industries.

Second, we only categorise spin-offs due to the type of relation they have to the incumbent firms. Nevertheless, it might also be important to distinguish further. Even spin-offs with direct relations to incumbent firms can differ in how related they are to the business areas of the incumbent firm. Is there a considerable overlap in knowledge or is this overlap small (Sapienza et al., 2004). Further, how can the knowledge overlap be characterised: Is the knowledge overlap technological or market-oriented (Agarwal et al., 2004). Furthermore, newer studies show that it might be important to study the health of the incumbent firm in that the inheritance of the incumbent firms to the spin-offs might be affect the performance of the spin-offs (Eriksson & Kuhn, 2006).

Third, in this article we addressed the importance of whether the spin-offs are supported by their incumbent firms or not. However, the sample we presented does not show explicitly which resources are important for the development of spin-offs and which might hinder the development of spin-offs. Only few researchers have considered this aspect, such as Chesbrough (2003) who indirectly measures how the experience and competences from a VC or incumbent-insider on the Board of the spin-off affect the performance of the spin-off. However, Chesbrough only partially looks at how different resources might affect the performance of spin-offs. Further research should be conducted to illustrate how tangible as well as intangible resources influence the performance of spin-offs.

### 7. CONCLUSION
Our research addresses that it is important not just to distinguish between spin-offs in general and other start-ups, but also important to distinguish between different types of spin-offs. The group of spin-offs is not homogeneous. Further, it is also important to distinct between the spin-offs relation to incumbent firms as it can have a strong implication for the spin-offs performance as our research showed. Our research showed that spin-offs performed better than independent start-ups concerning profit and annual turnover. Our research also showed that between spin-offs, spin-offs with indirect relations perform better when it comes to annual turnover than spin-offs with direct relations to incumbent firms. There also exists strong evidence that spin-offs with indirect relations perform better when it comes to growth in number of employees compared to spin-offs with direct relations to incumbent firms.

8. REFERENCES


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