Network and firm antecedents of spin-offs: Motherhooding spin-offs

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ABSTRACT

We advance firm and network conditions that are favorable for the gestation of new spin-offs by entrepreneurial employees that exit the mother firm to constitute their own companies. This type of entrepreneurial activity has some unique characteristics. We suggest that spin-offs from certain parent firms have fundamental network benefits that increase their likelihood of survival and success. These benefits accrue on the form of social resources and a unique embeddedness in networks of other offspring and mother firms, and do not require the spin-offs to engage in any direct exchanges with the parent firm. The process which we call 'motherhood' highlights the potential for a mother-progeny and child-child model that promotes entrepreneurial action through spin-offs, and allow us to understand the conditions under which interorganizational networks of firms emerge and thrive as an entrepreneurial process. We conclude that considering a motherhood process, with the characteristics defined in this paper, contributes to the study of entrepreneurship and network evolution.

Keywords: Entrepreneurship, spin-offs, motherhood, network benefits

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1. Introduction

The last decades have seen a flurry of entrepreneurship research, particularly focused on high technology industries, high-tech startups, and on the characteristics of the entrepreneurs. Few studies, however, have focused more narrowly on spin-offs, and to our knowledge no study has yet examined the firm and network determinants of spin-offs. Notwithstanding, it is evident that employees sometimes exit their parent organizations to establish their own firm - which we call spin-offs (Garvin, 1983; Klepper, 2001; Phillips, 2002). While new spin-offs may have disadvantages compared to established firms, the ties of the spin-off to the parent firm minimize those disadvantages. Networks literature suggests that inter-firm ties increase firms' likelihood of success by reducing the uncertainties of resource dependence from the environment (e.g., Higgins and Gulati, 2003), exposing firms to a larger pool of opportunities, and providing legitimacy. The relationships with other firms are particularly important for new and small firms, as they help secure initial physical and social resources (Singh, Tucker and House, 1986; Oviatt and McDougall, 1995).

Extant research on spin-offs has been recently classified by Klepper (2001) into four categories (see also Helfat and Lieberman, 2002; Phillips, 2002). The first category includes the research examining spin-offs as resulting from (path-breaking) innovations that lead to the emergence of new markets. In this case, employees create their own firm because the parent firm does not want, or is unable, to exploit the innovation (Wiggins, 1995). Second, research focusing on employees learning from the parent firm and independently exploiting the knowledge absorbed throughout their working experience. These studies debate the transfer of knowledge, routines, skills, procedures from the parent to the new spin-off (Brittain and Freeman, 1980; Carroll, 1984; Hannan and Freeman, 1984). Some scholars have questioned the extent to which these spin-offs parasite and deplete the knowledge of the parent firm, and whether spin-offs are a dreadful outcome, as they may enter in competition with the parent firm. The third category of research emphasizes the inability of incumbent firms to exploit opportunities. Klepper (2001) refers to these as "organizational difficulties", which may entail organizational rigidities, crisis (see also Cooper, 1985), or takeovers (Brittain and Freeman, 1986). Entrepreneurial employees may set up their own venture to exploit these opportunities.
The last category identified by Klepper (2001) compares spin-offs to children, and is closer to the arguments developed in this paper. This stream of research, often designated by parenting models or parent-progeny relations, is fundamentally different from the previous three and warrants additional examination. According to this perspective, parental support is helpful to the spin-off firm's performance, but existing studies tend to focus specifically on spin-offs inheriting and reproducing blueprints and organizational routines from the parent firm (see also Brittain and Freeman, 1986; Phillips, 2002). The network benefits that spin-offs may also inherit have not yet been addressed. Hence, in this paper we share some commonalities with this forth group of research but advance a motherhooding process that is different from traditional parent-progeny studies. In this paper we contribute to the area of research on spin-off firms suggesting that there are important network benefits for spin-offs that are gestated in specific mother companies. These benefits explain why some firms gestate a higher number of spin-offs and also why these spin-offs may be more successful.

In this paper we investigate network and firm characteristics that are favorable for the gestation of new spin-offs by entrepreneurial employees. We seek to extend our thinking on the antecedents of spin-offs to better understand under which conditions interorganizational networks of firms emerge and thrive, and, more importantly, which parent firms are better wombs for gestating more and more successful spin-offs. The parent firms that generate a larger number of spin-offs are those that offer a greater extent of network benefits to their offspring. Furthermore, we will suggest that these parent firms are easily identifiable because they are large, older, high performing, and extensively connected high status firms. The parent firm intentionally or unintentionally provides the spin-off with ties to its offspring and to other firms in its business network that are willing to transact, but also provides the spin-off with social intangible resources, such as reputation, credibility and legitimacy that make it a more attractive partner to a wider pool of agents. Furthermore, because the mother firm provides reputation and legitimacy to the spin-off that enhance the spin-off's likelihood to survive and expand, some firms will be more fertile wombs for the gestation of new spin-offs. Therefore it is important to understand the social network in which new firms originate (i.e., the genesis of the ties) in order to generate a more complete understanding of the origin and development of inter-firm organizational forms, firm behavior, and performance.
The remainder of the paper is organized as follows. The first section introduces the motherhood framework. In the second section we develop propositions that delve into the conditions that lead to a greater gestation of new spin-offs, with particular emphasis on the effects of mother firms' connectedness, cohesiveness, centrality, size, and age. We conclude this paper with a broader discussion, implications, and directions for future research.

2. The Motherhood Framework

Organizations are reliant on the inflow and outflow of resources from and to the environment for survival and growth (Pfeffer and Salancik, 1978). To secure those resources firms need to transact with other agents (Gulati, 1998), and firms that are better connected have a competitive advantage over poorly connected firms (Rowley, Behrens and Krackhardt, 2000). However, the firms' pool of relationships is influenced by the initial configuration, at founding, of the surrounding network, as well as their position in this network that provides access to other firms (Freeman, 1978; Borgatti and Everett, 1992; Holm, Eriksson and Johanson, 1996; Gulati, 1998; Hite and Hesterly, 2001).

The pool of relationships is even more crucial for new firms (Larson, 1992; Hite and Hesterly, 2001; Hitt et al., 2001) because these ties provide the new firms with the start-up resources, the legitimacy, and reputation needed for transacting with other firms (Stinchcombe, 1965; Stuart et al., 1999; Higgins and Gulati, 2003). However, other firms are likely to be reluctant to engage in exchanges with new spin-offs (Gulati, 1998; Hite and Hesterly, 2001; Podolny, 2001). Thus, at the moment of founding the most important asset of the entrepreneur seems to be the number and quality of his or her ties to adjoining agents, and as we suggest, to the parent firms and their networks. For example, Higgins and Gulati (2003) argued that the social network ties of the management team to the previous employers are significant determinants of success, because these ties function as reputation referrals that help evaluate the emerging firm. Staber and Aldrich (1995) argued that entrepreneurs maintain their pool of ties prior to the starting of their own firm. Sedaitis (1998) argued that the entrepreneurs' base of prior social links, or prior acquaintanceships, to incumbent firms is crucial to the entrepreneurs' success. Moreover, we suggest that the ties to the parent firm are important in the context of new firms' founding because they can provide the spin-off with access to information, resources, markets and technologies (Gulati, Nohria, and Zaheer, 2000), and are sources of credibility, legitimacy, social
endorsement and identification of opportunities (Hitt et al., 2001). Although the importance of firms' ties is well acknowledged, scant attention has been devoted to the network benefits accruing from the "qualities" of those ties. We can examine the social benefits of those ties as predictive of the rate of spin-offs and the spin-offs success.

2.1. Entrepreneurial Activity and Parenting Models

In a literature review of the existing studies on spin-offs and new firm formation we found three main motives for why some employees exit their parent firm and incur the risk of setting up their own business. First, employees have the expectation of a greater financial reward. Second, employees are disgruntled have some degree of dissatisfaction in the work place. And, third, the inability, or inertia, of incumbent firms to exploit emerging opportunities (see Cooper, 1985; Klepper, 2001; Phillips, 2002), and unwillingness to pursue ideas proposed by the employee. In this case, it is the frustration of the employees with the slow pace of change that pushes them to set up their own firms (Brockhaus and Horwitz, 1986). In all these cases it is frequently assumed that spin-offs are unfriendly and often competitive with the mother firm. The crucial component in the establishment of these new enterprises is the knowledge they incorporate which is easily transportable. In this paper we do not address the causes for entrepreneurial activity or why some employees decide to exit the parent firm (Cooper, 1985; Brittain and Freeman, 1986; Wiggins, 1995; Klepper, 2001 for a review of these motives), but rather assume that to each exit corresponds an opportunity that was detected for an entrepreneurial endeavor.

We define entrepreneurship, following Gartner (1988) and Hitt, Ireland, Camp and Sexton (2001), as the identification and exploitation of previously undetected or unexplored opportunities that lead to the creation of new organizations. Entrepreneurial spin-offs are those new firms, typically small, that are created by employees that identify an opportunity for brokerage between two separate firms or a new technological or market opportunity and thus exit the parent firm to create their own business (Garvin, 1983; Klepper, 2001; Phillips, 2002). These entrepreneurial spin-offs are substantially different from corporate spin-offs where one division is made formally independent from the corporate firm that continues to hold equity control over the subunit's operations. The corporation generally decides to constitute a separate firm to pursue an idea it thinks is worthwhile but better pursued in a separate entity. In these cases we usually refer
to corporate spin-offs, corporate entrepreneurship, or corporate divestments. We do not focus on such type of spin-offs.

Attending to entrepreneurial activity some scholars have been developing studies emphasizing parent-progeny relationships, notably studies that move beyond a focus on disgruntled employees, and beyond the perspective that to each spin-off there is an underlying innovation. Saxenian's (1994) work on Silicon Valley presents the image of a “family tree” of Fairchild Semiconductors - whereby a large part of the dynamism of Silicon Valley was induced in the region by the ‘Fairchildren’. These employees seem to have exited because Fairchild was unable to pursue many technological developments, and although some Fairchildren grew to become fierce competitors of Fairchild, they cooperate among themselves to their mutual benefit.

Parent-progeny relations have been more extensively examined in terms of the spin-offs adopting practices learned at the parent firm. Brittain and Freeman (1980), and Carroll (1984), Hannan and Freeman (1989), Phillips (2002), among others, have mainly focused on the transfer of parental practices and organizational forms, skills, routines, and blueprints to the new firm. Using a sample of Silicon Valley law firms Phillips (2002) examined how firms' genealogy influenced the likelihood of organizational failure. These studies tend to conclude that the prior history and work experience of the new firms have a deep impact on the firms' survival (Helfat and Lieberman, 2002). Essentially, these studies suggest that the new firms' capabilities are determined by the founders' prior experience in the parent firm that they are able to leverage in identifying new business opportunities and in managing the operations (Shane, 2000; Burton et al., 2002). Interestingly, although some of these studies assessed how the characteristics of the parents influence the likelihood of success of the offspring they focus on the parents' routines and have completely disregarded the network benefits that could accrue to the offspring as an alternative explanation of their success.

While there are other models of spin-offs and of entrepreneurship, the motherhood model, or process, we develop in the next sections is a specific subset. The motherhood model is not necessarily purposeful\(^1\) as is the mentor-capitalist model found by Leonard and Swap (2000) in

\(^1\) Although it may be interesting for future research to consider how some firms may develop motherhooding as a planned strategy. This is possibly the case underway at Procter & Gamble (P&G).
Silicon Valley; is not based on equity relationships between the mother firm and the spin-offs as are the angel investors; and it is not based on supporting the spin-offs with access to infrastructures and venture capital as are the incubators. More importantly, the motherhood model does not apply to disgruntled employees that visibly cut their ties to the mother firm.

2.2. Motherhooding Spin-offs

Parenting models of entrepreneurship have been identified before. We use the term "motherhood" to distinguish our model from prior work on parenting processes. The motherhood process suggests that the technical expertise generated and the social connections established by the employees (or entrepreneurs) with the mother firm ensure a position for the spin-offs in the mother firm's network, and simultaneously reduce potential liabilities of the spin-offs. This perspective is consistent with Abrahamson and Rosenkopf's (1997) suggestion that we need to understand the social network in which new firms originate in order to have a more complete understanding of firms founding, behavior, and performance.

Our motherhood process highlights six main elements, which were at least partially addressed in extant research. First, a large number of new (and typically small) firms are founded by employees that exit an incumbent firm to create their own firm (Garvin, 1983; Freeman, 1986; Saxenian, 1994; Pinch and Henry, 1999; Hendry, Brown and DeFillipi, 2000; Phillips, 2002). Second, entrepreneurial spin-offs are a subset of small and new firms that typically have liabilities (e.g., newness, smallness) that need to be overcome, and the protection conferred by the mother firm is likely to improve the spin-offs' likelihood of success (Podolny, 2001; Higgins and Gulati, 2003). Third, the mother's support, intended or unintended, provides social resources to the spin-off and facilitates access to other firms, both in the immediate vicinity of the mother as well as more distant. Fourth, offspring from the same parent share some sense of identification and cohesiveness among them (Hite and Hesterly, 2001). Fifth, some mother firms gestate more spin-offs because they reduce more the uncertainties associated to transacting with one of its offspring by endowing it with a heritage consisting of firms willing to exchange with it. Lastly, the spin-off may, or may not, actually engage in physical exchanges with the mother firm. The network-based benefits that accrue to spin-offs occur independently of actual exchanges with the mother. The motherhood process is based on the network advantages that insider spin-offs have in adhering to an existing network from inception.
The motherhood model is in essence a model of entrepreneurship associated with highly interlinked and cohesive networks where identity and personal ties prevail and has some idiosyncratic features that set it apart from existing research. The basic premise of this model is that spin-offs inherit the social connections of the mother firm allowing them to collaborate with other offspring but also with a wider diaspora of firms in the mother's network. Hence, in addition to benefiting from possibly holding a tie to the mother, even if it is not materialized in physical exchanges, new spin-offs also benefit from obtaining access to the mother's own ties, and particularly to the other mother's progenies. According to Hite and Hesterly (2001) firms gestated in the same womb share some sense of identification and cohesiveness among the offspring. A former Procter & Gamble executive illustrated this sense of identification and heritage as "I still write a memo today in the way I learned to write it at P&G. And I can always tell when I get a memo whether they are following the P&G style" (Financial Times, 2004). Eisenhardt and Forbes (1984) also noted how cohorts of firms support future firms. Hendry et al. (2000: 140) in the study of Pilkington, in North Wales, noted that the Pilkington spin-offs keep their ties to the mother firm and to the other offspring - "we are interested in what each is doing and are likely to pass on possible contacts and ideas for business". Hence, these mothered spin-offs are uniquely embedded in networks mother-child, child-child, and mother's ties-child.

Contrary to more conventional thought, the motherhooding of spin-offs does not require any internationality by the mother firm. The mother firm supports the spin-off in which it has no ownership because, first, this support is often unintended -- the access to the parental networks does not require the formal support of the mother. Motherhooding relationships are public and known. Other firms know the birthplace of the entrepreneur, they associate the entrepreneur to the parent firm, they extrapolate qualities and capabilities from the parent to the spin-off. The spin-offs benefit from the status spillovers (Stuart, 2000), the legitimacy and inherited reputation (Higgins and Gulati, 2003). Hence, former links to certain mother firms are like ‘reputation referrals’ that mitigate uncertainties of the spin-off and provide legitimacy.

It also does not necessarily require that spin-offs exchange physical resources with the mother firm. They may or may not do so, but the network benefits are largely independent of actual exchanges. That is, the ties to the mother firm are not based on resource dependencies. Notwithstanding, the spin-off may exchange with the mother firm if its outputs are needed, but also with any other firm. That is the relationships of the spin-off are probably *polygamous* (Jones,
Hesterly and Borgatti, 1997) as the spin-off exchanges with the mother firm and its offspring, but also with their competitors.

Furthermore, while extant research tends to see entrepreneurial spin-offs as innovative, this is not a necessary condition in our motherhood model. Employees may create their own spin-off for a variety of other reasons. Employees leave to pursue their dreams, to seek change, or business opportunities, among which may be the exploration of a technological innovation.

An interesting example that highlights many features of this motherhood process, specifically noting the networking among offspring but also how some mother firms are changing the way they look at spin-offs, appeared recently in several media outlets: the case of the P&G alumni. After many years of resentment towards executives that exited, P&G is changing from the company that treated former employees like traitors to now welcome them and “trying to nurture links with its corporate diaspora” (Financial Times, 2004). According to A.G. Lafley, P&G’s CEO, from the point of view of P&G “the alumni network is a solar system of connections” and “our alumni are potential partners, customers, suppliers and connectors to other potential partners, customers and suppliers. It’s all about connections” (Financial Times, 2004). For the executives that exited, having been a P&Ger signifies that they share the same “fraternity handshake”, and the common training and ethical heritage acquired at P&G (source: P&G gives networking new meaning. The Cincinnati Enquirer, 2002). Mary Beth Price (former employee and president of the P&G alumni network) further stated that "Procter people hire Procter people" and "former employees want to connect with other Procter people, outside the mother ship". This example denotes that not only P&G is changing the way it sees spin-offs, but more notably the networking and reputation benefits that accrue to former employees in terms of collaborating with other former-P&Gers. Hence, the support of the mother firm does not even need to be intended, it is often on the form of a sense of identification, beliefs, and values that offspring share. It is also about knowing one's origins, or genealogy. It is worth noting, however, that the dynamics just described are not exclusive to P&G and rather are emerging between one-time co-workers from Netscape, Oracle, Microsoft, and other companies that have created their alumni networks to help former colleagues stay connected and share ideas. The mother firms themselves are increasingly supportive of these activities.
In sum, spin-offs further benefit from the social and physical resources that are intended or
unintendedly transferred from the mother firm to the spin-off. Some mother firms will generate a
higher rate of spin-offs because the spin-offs have a higher likelihood of success that accrues
from the networks benefits defined. For example, spin-offs from successful mother firms have a
reputation benefit ease obtaining financing, customers, attracting employees, interacting with
local institutions, and so forth. These spin-offs will also benefit from exchanging and identifying
with prior offspring of the mother. Conversely, the motherhood process is likely to be averse to
start-ups created by outsiders to the network (or cluster), which will have a lower likelihood to
survive and succeed (Klepper, 2001). This is because this model is akin to insiders and the
communities of ties that are required to gain access to physical and social or transactional
resources.

2.3. Benefits to the Mother Firm

The mother firms may actually draw benefits from their offspring. The spin-offs may reduce the
mother's resource needs and uncertainties. Coviello and Munro (1995) noted that spin-offs are
often founded from the identification of a resource gap in the parent firms' value chain. The
clustering of spin-offs around the mother in related and complementary activities reinforces the
parents' competitiveness, in the network and mitigates their resource uncertainties. Spin-offs may
also supply the mother firm when she withdraws from non-core businesses. In these instances,
mother firms may devote their resources to their core activities/competencies and outsource to the
spin-offs less important activities. The contemporary perspective that firms should concentrate on
their core competencies (Hamel and Prahalad, 1990) justifies that mother firms do not expand to
exploit all emerging business opportunities, even when the managers identify these opportunities.
As Hendry et al. (2000) noted, when incumbent firms withdraw from non-core activities they
create space for spin-offs.

The benefits for the mother firm do not need to emerge directly in the form of resource exchanges
with the progeny, accrued revenues, or procurement relations. In fact, the most important benefit
may be that spin-offs contribute to build the mother's position in the network, increasing its
centrality, reputation, visibility and status. Other benefit may be the enhancement of the mother's
innovative ability and the extension of its network. For example, new spin-offs may convey
future technological and market opportunities to the mother firm, and give it wider network contacts that may span beyond the mother's current geographical and technological boundaries.

Another benefit for the mother firms accrues in the form of reduced transaction costs. Proximate firms are more likely to develop mutual trust and easier interaction because they exchange larger amounts of information, while the benefits of inter-temporal cooperation constrain opportunistic behaviors (Williamson, 1985). This type of ties are ‘regulated’ by social norms. When the market is imperfect, individuals trust their personal cohesive contacts (Shah, 1998) because cohesive ties reduce uncertainty and promote trust (Granovetter, 1973; Benjamin and Poldony, 1999) constituting sources of relational stability (Kale et al., 2000).

3. Gestating Spin-offs: The Characteristics of Mother Firms

In this section we explore which and how are some network and firm characteristics important determinants of spin-offs. Some firms will be more likely than others to generate more new spin-offs, as a function of their own network and position in the network (e.g., extent of connectedness, centrality) and firm characteristics (e.g., size, age). We suggest that both the rate at which new spin-offs are gestated in a mother firm, as well as the spin-offs’ likelihood of success are actually intertwined. In other words, the same characteristics that make some mother firms more fertile also increase the odds of success of its offspring. The new spin-offs from more fertile mother firms benefit from the ties to the parent, and to the parents' other offspring, enhancing their likelihood of success. Success breeds additional spin-offs.

3.1. Mother Firms' Connectedness

The extent to which the mother firms are connected through business relationships to other firms is an important driver of spin-offs. In some cases the mother's ties to other firms are sporadic, intermittent, and determined by each project, as the firms reconvene in disparate forms for each project (e.g., Robins, 1993). In other cases, they engage in more stable and repeated interactions whereby it is the resource uncertainties that shape the design of the network (Dyer and Chu, 2000; Dyer and Nobeoka, 2000). According to Dyer and Nobeoka (2000) the ties among firms are more often of the recurrent type rather than based on on-the-spot transactions. Firms with recurrent transactions will probably develop greater trust and get jointly involved in a multitude of projects and collaborations. Through repeated inter-firm interaction novel needs (i.e., supply
holes) for recombinations of existing skills or resources (Schumpeter, 1976) are unveiled, and these are potential opportunities for new spin-offs to, for example, assume a broker role between firms or markets that otherwise would not be connected (Burt, 1992; Walker et al., 1997). Notwithstanding, even intermittent relationships may result in the generation of novel opportunities, but less likely so, because firms in intermittent exchanges will possibly restrict the extent of information sharing to the minimum to prevent opportunistic behaviors (Williamson, 1985). Restricted information flows generate fewer opportunities for entrepreneurial actions.

Firms with a more extensive pool of business contacts - hence, more connected firms - with whom they exchange and collaborate in business or research projects, sharing of clients' orders, or pull of complementary assets to fulfill a client's order are likely to be more fertile grounds for spin-offs. Cooperative ties often require the exchange of employees and the inter-firm transfer of knowledge that may present evidence of resource holes prone to be occupied by entrepreneurial action. The more so when the ties of the mother transverse industries, technological or geographical boundaries presenting the employees with opportunities for, for example, recombinative innovations. Thus, the more connected the parents, the more opportunities for entrepreneurial employees to spin-off; which is parallel with Sedaitis (1998) suggestion that the network of relationships of new firms depends on the social density of the founding network. Hence, mother firms that are more connected are also more likely to be the grounds for the gestation of more spin-offs.

**Proposition 1.** *The more extensively connected are mother firms, the more likely will they be to gestate new spin-offs by entrepreneurial employees.*

3.2. Mother Firms' Centrality

The study of the network's determinants of spin-offs requires that we analyze how the mother firm's centrality, or position, within the boundaries of the network affect the founding of new spin-offs. We refer to centrality as the strategic location the mother firm occupies in the network. Centrality gives the firm the ability to influence the network through its resource links to other firms in and/or outside of the network by exercising the power to control resources, transmit information, bridge clients-suppliers (Freeman, 1978). Typically, extant research tend to posit that less central firms, for example firms at the boundaries of the network, are more likely to be surrounded by a larger number of structural holes than firms at the core (e.g., Burt, 1992), and,
thus, provide a richer environment for entrepreneurial spin-offs. In other cases, the focus is on the industry. For example, Klepper (2001) noted that sprouting fast change high technology industries with frequent innovations are rich in structural holes to tap into the insufficient supply of incumbent firms and could lead to a higher number of high technology startups. In both cases, firms at the periphery are probably more responsive to technological changes, and to adapt their product portfolio as the technologies and markets shift. However, structural holes are not exclusive of the periphery, because they are rather a function of the firm's ability to bridge geographic and product markets, which is not solely dependent on the position in the network.

Central firms tend to have higher reputation (Podolny, 2001) and may occupy structural holes (Burt, 1992). The structural position moves beyond the immediate direct ties of the firm to the advantages accruing from the position occupied in the network (Burt, 1992, 1997). Firms in structural holes connect firms that would not be tied otherwise (Burt, 1992; Hite and Hesterly, 2001), and are critical to the workflow insofar as the relationships maintained by the firm cannot be easily restored without the firm's presence. Brass (1984: 521) designates it as “being irreplaceable”. Centrality may accrue from occupying structural holes because bridging markets permits controlling the flow of resources, information and contracts (Freeman, 1978; Granovetter, 1983; Bonacich, 1987). Central firms have a higher density of links to other firms, are more aware of shifts in the industry, and are more knowledgeable of other firms' competitive moves (Gulati, 1998) than less central firms. Thus, it is likely that central firms generate a higher volume of activity.

Central firms are generally known in the industry, and are more likely to be searched by potential partners for technological and market undertakings, which results in a larger volume of activity. These connections may be to firms in- and outside the network (Granovetter, 1983), to firms and networks in other domestic and foreign networks and markets (Burt, 1992). These relations generate new clients' orders that possibly impose the demand for higher production volume, and possibly also technical innovations. The increased volume of activity and diversity of products/projects may generate either the need for internal expansion or for outsourcing. When a central firm cannot fulfill the clients' requirements a new opportunity emerges for an entrepreneurial employee to spin-off (Hite and Hesterly, 2001) from the mother. These firms are more likely to attract the most skilled and motivated employees, and these employees are more apt to possess the entrepreneurial orientation (Oviatt and McDougall, 1994) that drives them to
search for spin-off opportunities. That is because ties to central firms ensure the new spin-offs' access to start-up resources, reputation spillovers (Stuart, 2000), and clients. Stuart et al. (1999), for example, suggested that the quality and reputation of the spin-off network is more important that its sheer size for the spin-off success. Central firms are thus likely to present the employees with more opportunities for entrepreneurial spin-offs because of their position in the network and the access to a larger number of projects in which they are involved.

**Proposition 2.** The more central the mother firms are, the more likely they will be to gestate more new spin-offs by entrepreneurial employees.

The centrality and status of the parent firms may be intertwined in their ability to generate a larger number, and more successful, spin-offs. New spin-offs seem to benefit from being generated by central or high status parent firms (Higgins and Gulati, 2003). Status refers to the social capital of the firm in the network, its visibility and recognized importance (Podolny, 1993). Centrality refers to the strategic location the firm occupies in the network. It is likely that central firms have higher reputation or status (Podolny, 2001), but status may also emerge independent of centrality through, for example, innovation, participation in highly visible projects, leadership of trade and commercial associations, and so forth. However, innovator firms are more likely to occupy structural positions that render centrality, and reputation benefits (Bonacich, 1987). These firms are also among those that gestate a higher number of spin-offs, as denoted by Saxenian's (1994) study of Silicon Valley where the most central firms seem to be the innovators. In addition, it is reasonable that clients search the high status firms, not necessarily central firms, for innovative projects because of their reputation. Moreover, the 'best' employees seek the highly reputed firms and not necessarily the most central, nor the most innovative. Notwithstanding, both these characteristics are good predictors of a mother firm's ability to gestate spin-offs.

### 3.3. Mother Firms' Cohesive Connections

Cohesive ties provide a source of trust and familiarity (Kale et al., 2000), which are essential for the successful gestation of spin-offs. The fabric of the cohesive ties, which are embedded in the social relationships, is stronger than economic motivations (Granovetter, 1992) and is based on personal relationships, social capital or past interactions (Hite and Hesterly, 2001). Therefore, personal cohesive ties of the new spin-off to its mother firm provide legitimacy to the new spin-off, and, most importantly, convey opportunities and clients more effectively than other types of
ties (e.g., formal, contractual relationships). Mother firms embedded in a network of cohesive ties with other firms and their progenies favor the creation of opportunities for new spin-offs by entrepreneurial employees. These mother's inter-firm cohesive ties are more favorable for more extensive collaboration, and larger exchange of information from which employees may identify opportunities for spin-offs. Cohesive ties also promote trust (Shah, 1998) because individuals trust their personal contacts. These ties also carry more and better information between individuals, reducing uncertainty (Granovetter, 1973; Gulati, 1998; Benjamin and Poldony, 1999). The close, cohesive, social ties seem more important than formal institutional contacts (Lazarsfeld and Merton, 1954; Hite and Hesterly, 2001). Trust is more likely to exist between mothers and children, and among progenies of the same mother firm (Hite and Hesterly, 2001) because they also share larger social capital (Walker et al., 1997; Coleman, 1988).

Cohesive ties reduce uncertainty (Benjamin and Poldony, 1999; Granovetter, 1973) and facilitate the exchange of larger amounts of information, while the benefits of inter-temporal cooperation constrain opportunistic behaviors (Williamson, 1985). When the market is imperfect, individuals trust their personal cohesive contacts (Shah, 1998). Emerging firms with personal trust relations with incumbent firms are more likely to succeed (Kale et al., 2000), as is reflected by the motherhood model.

Firms in cohesive networks are likely to cooperate more often and more extensively. Cooperation may assume diverse forms: employee mobility and exchange, technical assistance, participation in joint research projects, sharing of clients' orders, pull of complementary assets for a client's order and/or large project, and contribution to trade fairs (e.g., Saxenian, 1994). These forms of interaction between mothers, that are only possible when cohesive relationships prevail, increase communication and information flows, facilitate the diffusion of innovation, and enlarge the tacit and explicit knowledge of the employees. The more cohesive the cooperation between firms the more opportunities for the discovery of business opportunities or untapped markets by entrepreneurial employees to spin-off.

**Proposition 3.** The more cohesive is the network of the mother firms, the more likely these firms will gestate new spin-offs by entrepreneurial employees.
3.4. Mother Firms' Size

The mother firms' size is likely to significantly affect their ability to generate spin-offs. Birch (1987) and Cooper (1985) argued that smaller firms are more likely to gestate more spin-offs, because on the one hand, smaller firms offer better learning possibilities for employees, and on the other, small firms are likely to have multiple supply insufficiencies in their network that constitute good business opportunities for spin-off. Cooper further argued that smaller firms may generate more new spin-offs because they provide employees with more clear models to follow when setting up their own small firms. Perrow (1992) added that small firms are ‘pockets’ of exploitation, long working hours, and unusually low wages, which could explain why employees exit the parent firms in search for better conditions. Small firms flexibility to exploit more radical, path braking innovations, that pose problems for larger incumbent firms (Tushman and Anderson, 1986) may also provide opportunities for spin-offs. That is, these authors do not focus on the non trivial network-based advantages that a large parent may provide. A perspective on the rate of spin-offs purely based on the inheritance of capabilities and skills from the parent should not be sufficient, and require that we factor in the lack of network benefits as described previously. That is, although it is reasonable to assume that small firms could provide more opportunities for spin-off, the likelihood of failure of these spin-offs is higher and probably leads these employees to resist an exit to form their own firm.

However, these authors did not mention that small firms are much less of a protective womb for spin-offs and that employees exiting small firms can neither benefit from an extensive network of relationships of the parent, nor from the reputation and legitimacy inherited from the mother firm that may be the major determinant of the spin-offs’ survival. Cooper's and Perrow's suggestion comes at odds with the framework we develop because even though small firms may have more resource deficiencies that could be fertile opportunities for the gestation of new spin-offs, small firms can not provide social resources, or extensive networks of prior progenies to a new spin-off.

Arrow (1983) noted that, due to the high costs of any innovative activity, large firms - rather than their smaller counterparts - will be more likely to create opportunities for entrepreneurial spin-offs. Larger firms are likely to be involved in a variety of projects, carry broader product lines, and larger volume of activity which may provide entrepreneurial opportunities to detect unfulfilled activities in the parents' value chain. Larger firms possibly have more extensive
networks and carry more ties with other firms in the network thus serving as a better referent to
spin-offs. In addition, large firms are also likely to gestate more spin-offs because they also have
more employees, and are likely to attract the best workers. Potentially, more employees mean
more future founders who may benefit from the social resources provided by the mother. Thus,
spin-offs from large firms may in fact have an advantage in terms of identifying business
opportunities, but also have an advantage based on visibility, credibility, reputation and
legitimacy effects spilling over from the mother firm. The P&G case previously mentioned is
illustrative of the visibility of larger firms and of the potential network benefits for new spin-offs.
Therefore, the most fertile mother firms for spin-offs are likely to be larger firms.

Proposition 4. Larger mother firms are more likely to gestate more new spin-offs by
entrepreneurial employees than smaller mother firms.

3.5. Mother Firms' Age

The mother firm's age is also likely to be a determining factor in their ability to gestate more and
more successful spin-offs. Extant research seems to indicate that younger mother firms should
gestate more spin-offs because they are more likely to have multiple unsatisfied needs of tangible
and intangible resources. Possibly more important is that this view of spin-offs assumes that there
is some degree of relative vertical specialization\(^2\) of the parent firms and the new spin-offs are
positioned up and down the product value chain in un- or under-exploited segments. In some
instances the spin-offs may be cooperative, in other cases they may compete with the parent.
Younger firms also provide the employees with more learning opportunities and hence more
opportunities to spin-off (Cooper, 1985). Younger firms are seemingly more innovative,
entrepreneurial, and based on novel technologies, because entrepreneurs tend to create firms that
exploit their specific, and frequently tacit, knowledge (Hite and Hesterly, 2001). This argument is
consistent with the traditional view in the entrepreneurship literature explicitly suggesting that a
frequent motivation for the spin-off is the full utilization of the capabilities and skills of
unfulfilled employees in response to opportunities detected (Shane, 2000). Smaller mother firms

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\(^2\) Traditional research tends to see the potential for vertical ties to be cooperative but has more difficulty seeing
horizontal ties as cooperative. The 'motherhood' model is neither based on vertical nor horizontal ties, though it is
likely that vertical ties predominate in a model of spin-offs. The important, however, is that the ties are non-
combatant or non-competitive, regardless if vertical or horizontal.
would be more fertile based on the idea that innovation activity is a *sine qua non* and *ex ante* condition for the emergence of entrepreneurial spin-offs.

Conversely, this traditional emphasis relates older age to lower innovative capacity, higher degree of formalization and control mechanisms, bureaucracies and mechanized routines, inertia, and inability to take advantage of emergent opportunities. Hence, older firms are more inert (Hannan and Freeman, 1984), less flexible (Phillips, 2002) and adaptive than younger firms (Nelson and Winter, 1982). They are mechanized in the usual set of routines and skills, and have fairly static architectural capabilities. Moreover, while these older firms could have a benefit from mothering spin-offs to indirectly regain adaptive ability, they lack the innovative attitude and entrepreneurial behavior to attract the most entrepreneurial employees. Old firms frequently have a liability of obsolescence (Scott, 1998). Finally, older firms would be surrounded by a pleiade of other firms (possibly prior spin-offs, although not necessarily) that provide all the complementary resources needed (Hite and Hesterly, 2001). These elements could indicate that these firms are less innovative than comparatively smaller firms and thus present fewer opportunities for spin-offs. However, the suggestion that younger firms are more fertile wombs for the gestation of spin-offs than older firms disregards the potential network-based benefits that accrue to the spin-off from being spawn from an older firm. More importantly, it disregards the lack of social resources that spin-offs from younger firms will probably endure.

In the context of parenting models, we advance what we envisage as a more interesting alternative, i.e. that older firms are more likely to induce more entrepreneurial employees to spin-off. Spin-offs from older firms have the network benefits we examined previously and hence spinning-off from older firms increases the likelihood of success of the spin-offs. A major component of the motherhood process is the legitimacy and social resources a parent firm could bring to bear for the spin-off survival and success. These resources presumably make spin-offs more likely, and also possibly more successful. It is exactly this higher likelihood of success that encourages the spin-offs in a social capital perspective. Well established parent firms, predictably older firms, seem to provide the most benefits for spin-offs once we appreciate the social, legitimacy, reputation and networking benefits, rather than simple inertia or innovative capacity or the inheritance of the parents' organizational practices. Hence, because young firms are less likely to have legitimacy and social resources, potential entrepreneurial employees are less likely to venture out to form their own firms.
In our motherhood model, more than the innovative activity of the mother firm, or the existence of supply holes, it is the network benefits that matter for the gestation of new spin-offs. In this regard younger firms have much less to offer to spin-offs in terms of social resources, such as reputation and legitimacy, than older firms. Spin-offs from older parent firms have a social capital advantage based on inherited reputation, legitimacy, identification, status, and so forth, but also on the possibility to engage in exchanges with the parents' prior (and future) offspring and with the other firms in the parents' network.

**Proposition 5.** *Older mother firms are more likely to gestate more new spin-offs by entrepreneurial employees than younger mother firms.*

In the preceding sections we developed a new argument relating the spin-offs rate and likelihood of success to network and firm characteristics. We showed that parent firms that are larger, older, central, high status, and more connected are likely to present the employees with a particularly munificent environment to spin-off. Spin-offs will have network benefits that are inherited intendedly or unintendedly from the parent firm. In the following section we discuss implications and avenues for additional research.

4. Discussion

In this paper we developed a variant within the parenting models as a new lens to the study of spin-offs by highlighting the network benefits that some parent firms may provide to their offspring. This seems a more reasonable approach than that prior research has taken. For example, Philips (2002) seems to have suggested that parenting would result in negative disruptions in the parent's social structure, sensemaking ability, socialization, and market positioning. Conversely, we suggest that parenting has a positive effect in terms of resource dependencies, survivability hazards, positioning in the industry, innovativeness, reputation, and ability to attract the best employees. Our model is based essentially on the network benefits - the social capital between parent firms and spin-offs, status, legitimacy and reputation spillovers - primarily for spin-offs but also for the parent firms.

The gestation of spin-offs in a motherhood model highlights the importance of ties to other firms and especially the access to the mother's social resources to secure start-up resources, information, knowledge, and markets. New firms, of which entrepreneurial spin-offs are a particular case, have an increased difficulty in accessing the resources needed; that is why they
are dependent on their external network and the initial ties to incumbent firms are so important. Spin-offs are susceptible to failure due to possible liabilities accruing from their newness and small size (Hannan and Freeman, 1977; Carroll, 1984). Besides the lack of resources, spin-offs also lack status, legitimacy, and reputation compared to incumbent firms (Stinchcombe, 1965). These liabilities may be mitigated when the spin-offs establish cooperative and symbiotic relationships with the parent.

Our arguments contrast those of scholars that only view the spin-offs as parasites that feed from the knowledge, innovations, and/or capabilities acquired by the employee at the mother firm (a.k.a. brain drain, skills drain). They only partly contrast with those researchers that view spin-offs as the result of innovations and market insufficiencies (see Klepper, 2001), because innovations are not a necessary condition for spin-offs in a motherhood model. Notwithstanding, Singh et al. (1986) suggested that the parent firms are essential for the new spin-off because they commit, directly or indirectly, their own reputation and encourage other firms in their hub to engage in exchanges with the new spin-off. Podolny (2001) noted that relationships signal lower risks to investors. Hence, the intended or unintended support of the parent firm triggers others to follow (Sedaitis, 1998), and supports that our model is well suited to explain spin-off frequency and higher rate of success for insider spin-offs than for outsider startups. Spin-offs will be more likely when gestated by firms that increase their likelihood of success.

In this paper we delimit the contributions within existing parent-progeny relationships but we depart from existing research introducing the idea that spin-offs may be uniquely embedded in networks of other spin-offs and mother firms. Therefore, this paper provokes our thinking on the nature of spin-offs and their relationship to the parent firms. Particularly interesting may be to understand whether, why, and when the relationship between spin-offs and mother firms is symbiotic or mutualistic rather than competitive. The motherhood model suggests cooperative or neutral relationships, but points out that cooperation may not be intended, and rather be an expected inheritance from the mother firm. The motherhood model we described is based on spin-offs in which the mother firm directly or indirectly influences the fate of the new firm through network benefits with which it endows its offspring.

What does the motherhood model mean to network evolution? The motherhood model suggests that the network's evolution is more endogenous than is traditionally suggested in the literature
(e.g., Doreian and Stokman, 1997). Networks evolve from inside as mother firms gestate new spin-offs that expand the boundaries of the network. As firms grow their product-market scope enlarges and new resource needs emerge (Hite and Hesterly, 2001). Because entrepreneurial employees are inside the firm, they detect these needs before outsiders do. In some instances, the mother firm may identify the opportunity but outsource it to privilege its core business; in other cases it may just not pursue it. This is a fertile ground for entrepreneurial employees to set up their spin-off. The evolution of the network is endogenous because it is characterized by the gestation of insider entrepreneurial spin-offs.

4.1. Future Research

A motherhood model has significant initial imprinting conditions upon the spin-offs' founding that affect the role and development of the spin-off (Stinchcombe, 1965; Gulati, 1998; Baum et al., 2000; Klepper, 2001; Phillips, 2002). The initial imprinting conditions lead firms to exhibit similar structural features (Stinchcombe, 1965), and suggest that the contextual environment of the network is a powerful antecedent of the gestation of new spin-offs. For instance, it is likely that employees that exit the mother firm tend to mimic the mother's actions, structure, market orientation, and location. This similarity is important for legitimacy. However, some rigidity may result when firms over-rely on current relations. For example, managers may tend to mimic similar others and restrict to local search (Cyert and March, 1963; Katz and Gartner, 1988). Future studies could offer important empirical insights on the mimicking effect on the spin-offs performance.

Some of our explanations could benefit from additional conceptual and, even more importantly, empirical determinations. For example, an alternative explanation for the relevance of centrality could be the following. As central firms build up their immediate network they could become less fertile in the future because previous spin-offs already cover all arbitrage opportunities. This reasoning is consistent with the saturation of the carrying capacity of the firms (Baum and Oliver, 1991; Gulati, 1995), whereby the density of ties around parent firms does not tolerate additional ties. The gestation of new spin-offs would thus be hindered. However, this view assumes at least a fairly mature industry where no significant product or process innovations are introduced and where no new clients enter, which is not a typical situation. More importantly, this view
disregards the network benefits of being spawn from a centrally located firm. Nevertheless, this is an interesting empirical research question.

Future research may clarify doubts on the existence of an insider advantage for spin-offs vis-à-vis outsider start-ups. Our motherhood model is akin to insiders and the communities of ties that are required to gain access to resources and only implies higher chances of survival for insider firms; that is, for firms originating in incumbent parent firms. However, the motherhood model is likely to be averse to start-ups created by outsiders to the network, which will have a lower likelihood to survive and succeed (Garvin, 1983; Klepper, 2001; Phillips, 2002). The relative success of insider spin-offs versus outsider start-ups has been noted before. For example, Phillips (2002) noted that spin-offs are more likely than de novo start-ups to have trustworthy relations to other agents, be better embedded, be more cognizant of inter-firms relationships, and be better informed about market opportunities. Garvin (1983: 10) also referred to the advantage of insiders compared to outsider individuals due to their "intimate familiarity with the market". Notwithstanding, actual empirical tests to assess which firms fail and which firms succeed are important.

Finally, future developments may seek additional firm and network dimensions that have an impact past individual incentives of the entrepreneur and atomistic understandings of entrepreneurial activity.

4.2. Implications

Although this paper is conceptual, some implications may be draw for practitioners, academics, and public policy. For practitioners and entrepreneurs, we highlight conditions at the founding that may bear substantial weight on the likelihood of success. We show that spin-offs have social/network benefits when spawn from larger, older, central, high status and more extensively connected parent firms. For the managers of incumbent firms we show that spin-offs are not necessarily an evil that deplete knowledge (a.k.a brain drain) and opportunities. Rather, incumbent parent firms have an incentive to support spin-offs because these contribute to the parent’s stock of social resources and may open the doors to novel technological and market opportunities. We further note that some firms may consider developing parenting to an intended strategy.
For researchers, we unveiled new lenses to study entrepreneurial action. In fact, our model is relevant to understand the emergence and growth of networks in a cohesive context. The imprinting conditions at founding (Stinchcombe, 1965) are still important, but the arguments are not solely based on resource dependencies or density of the network, rather it is the set of ‘qualities’ of the parent firm that shapes the spin-off’s initial conditions.

For public policy, we suggest that there is some evidence that selectively supporting more fertile parent firms may have substantial advantages. Policy-makers may move from supporting new firms in ‘strategic’ activities, or activities that explore the nation’s comparative advantage, to design the mechanisms that favor selected firms that have the potential for gestating a higher number, and more successful, spin-offs. As a second route, we also infer that policymakers should make employment flexibility as a priority to promote entrepreneurial action.

5. Conclusion

We advanced a parenting model of spin-offs based on the network benefits of being gestated by certain parent firms. These parent companies will gestate a disproportionate percentage of spin-offs, and these spin-offs are likely to be more successful than other spin-offs and startup firms. We identified the more fertile parent firms as being larger, older, holding higher status and centrality, and being more extensively connected to other firms. We moved away from the view that spin-offs are parasites that feed from the knowledge of the parent firm. Our motherhood model contributes to explain why some spin-offs are more successful, why firms founded by network, or industry, insiders seem to have a higher likelihood of survival and success than outsider firms. Future research may examine additional firm and network dimensions that have an impact on entrepreneurial activity that go beyond individual incentives of the entrepreneur and atomistic understandings of entrepreneurial activity.

To conclude, this paper suggested a model of motherhood based on spin-offs by entrepreneurial employees. The mother firm can be thought of as a protective umbrella abundant in resources, ties with other firms, reputation, and legitimacy, all of which can benefit the spin-off. The motherhood model, as a conceptual framework, sets the stage for a substantially new approach to firm founding and entrepreneurial action.
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<table>
<thead>
<tr>
<th>Nº</th>
<th>Author(s)</th>
<th>Title</th>
<th>Publication Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>199</td>
<td>Samuel Cruz Alves Pereira</td>
<td>Aggregation in activity-based costing and the short run activity cost function</td>
<td>January 2006</td>
</tr>
<tr>
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<td>January 2006</td>
</tr>
<tr>
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<td>December 2005</td>
</tr>
<tr>
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<td>December 2005</td>
</tr>
<tr>
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</tr>
<tr>
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<td>November 2005</td>
</tr>
<tr>
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<td>November 2005</td>
</tr>
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<td>October 2005</td>
</tr>
<tr>
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<td>October 2005</td>
</tr>
<tr>
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<td>João Correia-da-Silva and Carlos Hervés-Beloso</td>
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<td>October 2005</td>
</tr>
<tr>
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<td>Pedro Cosme da Costa Vieira</td>
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<td>October 2005</td>
</tr>
<tr>
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<td>Argentino Pessoa</td>
<td>Foreign direct investment and total factor productivity in OECD countries: evidence from aggregate data</td>
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</tr>
<tr>
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<td>Ana Teresa Tavares and Aurora A.C. Teixeira</td>
<td>Human Capital Intensity in Technology-Based Firms Located in Portugal: Do Foreign Multinationals Make a Difference?</td>
<td>August 2005</td>
</tr>
<tr>
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<td>Jorge M. S. Valente</td>
<td>Beam search algorithms for the single machine total weighted tardiness scheduling problem with sequence-dependent setups</td>
<td>August 2005</td>
</tr>
<tr>
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<td>Past expectations as a determinant of present prices – hysteresis in a simple economy</td>
<td>July 2005</td>
</tr>
<tr>
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<td>Filipe J. Sousa and Luís M. de Castro</td>
<td>Relationship significance: is it sufficiently explained?</td>
<td>July 2005</td>
</tr>
<tr>
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<td>Alvaro Aguiar and Manuel M. F. Martins</td>
<td>Testing for Asymmetries in the Preferences of the Euro-Area Monetary Policymaker</td>
<td>July 2005</td>
</tr>
<tr>
<td>181</td>
<td>Joana Costa and Aurora A.C. Teixeira</td>
<td>Universities as sources of knowledge for innovation. The case of Technology Intensive Firms in Portugal</td>
<td>July 2005</td>
</tr>
<tr>
<td>180</td>
<td>Ana Margarida Oliveira Brochado and Francisco Vitorino Martins</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
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<td></td>
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<tr>
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<td></td>
<td></td>
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<tr>
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<td>Mário Rui Silva and Hermano Rodrigues, Public-Private Partnerships and the Promotion of Collective Entrepreneurship, April 2005</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
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<td>Pedro Cosme Costa Vieira, Multi Product Market Equilibrium with Sequential Search, February 2005</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>João Correia-da-Silva and Carlos Hervés-Beloso, Contracts for uncertain delivery, February 2005</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
</tr>
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<td></td>
</tr>
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