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The Paradox of Resource Provision in Entrepreneurial Teams: Between Self-Interest and the Collective Enterprise

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Tiantian Yang,[a] Jiayi Bao,[b] Howard Aldrich[c]

[a] Department of Sociology, Duke University, Durham, North Carolina 27708; [b] Department of Business Economics and Public Policy, The Wharton School, University of Pennsylvania, Philadelphia, Pennsylvania 19104; [c] Department of Sociology, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27599

Contact: ty41@duke.edu, https://orcid.org/0000-0002-5194-4090 (TY); jiayibao@wharton.upenn.edu, https://orcid.org/0000-0002-4071-9007 (JB); howard_aldrich@unc.edu (HA)

Abstract. Viewing entrepreneurship as a form of collective action, this paper investigates the tension between an entrepreneurial team's reliance on collective efforts for achieving success and individual members' tendencies to withhold their personal resources. We argue that the precarious nature of the early founding stage and the difficulty of redeploying some resources for other uses amplify the risk of early-stage resource contributions and may lead to team members withholding resources or even free riding. Two conditions may help overcome such collective action problems: adopting a formal contract to specify rewards and sanctions and encouraging reciprocal exchange among team members through the lead entrepreneur's voluntary contributions. Analyzing a nationally representative multiwave panel study of entrepreneurial teams in the United States, we show that early-stage team members are reluctant to provide resources tailored to the business, even though such resources are critical to venture survival. We find that presigned formal contracts and founding entrepreneurs' initial contributions make members' contributions of such resources much more likely. Lead entrepreneurs' voluntary contributions to their businesses, signified by their provision of resources that impose high risks on themselves but increase the viability of the business, help mitigate collective action problems within entrepreneurial teams.

Introduction

Collective action in entrepreneurial teams has attracted major attention because entrepreneurs often bring aboard cofounders, making their business a collective effort (Cooper and Daily 1997, Kim 2006, Beckman et al. 2007, Xu and Ruef 2007, Ruef 2010, Wasserman 2012, Kim et al. 2013). Previous research has frequently viewed team-based start-ups as a strategy for acquiring resources because entrepreneurs commonly face resource constraints and must appeal to cofounders for assistance (Evans and Jovanovic 1989, Ruef et al. 2003, Beckman et al. 2007, Beckman and Burton 2008). This view is further encouraged by research documenting that entrepreneurs typically choose members based on their close connections (Kim et al. 2013). Among closely connected team members, shared interests and values ostensibly create a natural tendency for them to work in concert. These perspectives cast entrepreneurial teams in a positive light, viewing resource provision as a likely outcome of recruiting cofounders (Ruef et al. 2003,

Wasserman 2012, Jayawarna et al. 2014, Kim and Longest 2014).

However, an emerging stream of research has emphasized challenges to the internal provision of resources (Fehr and Schmidt 1999; Hellmann 2007; Wasserman 2012, 2017; Hellmann and Thiele 2015; Hellmann and Wasserman 2016). For example, Hellmann and Wasserman (2016) argued that cofounders may have reservations about committing their own resources because of concerns about the fairness of allocation procedures (Wasserman 2012, Hellmann and Thiele 2015). They pointed to scenarios in which cofounders may perceive their own skills or resources as more valuable than those of the lead founder and thus expect to own a larger share of the equity in return for their contributions (Hellmann and Wasserman 2016). However, because reliance on the cofounders' resources increases cofounders' bargaining power and reduces lead entrepreneurs' control, lead entrepreneurs may intentionally limit resource contributions from others as a strategy to retain control (Wasserman 2012, 2017).

If lead entrepreneurs allow such concerns over control loss to affect their decisions, they may unintentionally hamper their teams' capacities to acquire resources collectively (Hellmann and Wasserman 2016, Wasserman 2017). Through investigations of internal conflict and equity allocation decisions in entrepreneurial teams, this stream of work has fostered a new line of research on the challenges facing entrepreneurs in working with cofounders.

In this paper, we extend this line of inquiry by investigating the mechanisms that might mitigate the paradox that entrepreneurs inevitably face: Assembling an entrepreneurial team to elicit contributions from others may unintentionally create barriers to resource provision within teams (Wasserman 2012, 2017). We draw on an extensive line of research on collective action to explain how typical collective action problems—free riding and the holdup problem—may arise in entrepreneurial teams, discouraging team members from contributing. Most early-stage ventures are extremely precarious, creating uncertainty about returns on investment (Freeman et al. 1983, Carter 2004, Wasserman 2012, Yang and Aldrich 2012, Huang and Pearce 2015). Such uncertainty is further intensified by the sunk costs involved in providing resources tailored specifically to the new business (Aldrich and Yang 2014, Bennett and Chatterji 2019). We argue that the uncertainty of securing positive returns for their investments may prompt team members to withhold their resources, waiting on others to generate proof of a venture's viability before making their own contributions (Ruef 2010, Huang and Knight 2017).

Entrepreneurial teams commonly follow an objective equity principle mandating that everyone shares benefits equally, regardless of contributions. The objective equity principle further intensifies individuals' tendencies to withhold resources, undermining a team's effort to collect resources (Kahn et al. 1980, Ruef 2010, Hellmann and Wasserman 2016). Moreover, most early-stage new businesses are informally structured, without a clearly defined production function that relates contributions to payoffs. As a form of collective action, emerging team-based businesses thus engender a tension between a team's dependence on collective efforts to produce a viable business and individuals' natural dispositions to guard their personal interests.

We therefore explore the mechanisms that entrepreneurs can create to mitigate such tensions and reap the benefits of constituting a team. Previous literature has focused on the formal contracts implemented by lead founders to motivate resource contributions, such as configuring asset allocations and making equity contracts (Fehr and Schmidt 1999, Sine et al. 2006, Hellmann 2007, Wasserman 2012, Hellmann and Thiele 2015, Hellmann and Wasserman 2016). In contrast, we propose an alternative, informal approach whereby lead entrepreneurs encourage resource provision from team members by voluntarily contributing their own resources, especially those tailored for the particular business they are creating (Molm et al. 2000, Belenzon et al. 2017). By comparing these two types of procedures, formal and informal, we can analyze the mechanisms that drive resource provision within entrepreneurial teams and the types of social exchanges that are likely to form among team members (Lawler et al. 2000, Molm et al. 2000, Schaefer 2009). We posit that when lead entrepreneurs make their contributions voluntarily without negotiated terms, team members are likely to reciprocate by contributing comparable resources. However, when entrepreneurial teams adopt formal contracts to govern resource contributions, such formal contracts may undercut a team's ability to encourage resource contributions through informal mechanisms.

To test our propositions, we draw on the Panel Study of Entrepreneurial Dynamics II (PSEDII), a longitudinal data set on a representative sample of naturally forming entrepreneurial teams based in the United States that tracks the dynamics of resource provision from the very early stages of team formation. These teams were sampled in 2005, and they were all at the earliest stages of their ventures—a period when the original founders had only recently onboarded early team members (Reynolds 2007, Davidsson 2016). The study tracked entrepreneurs and their teams for six years, generating multiple waves of observations on the teams. Longitudinal data enable us to model changes over time in contributions from lead entrepreneurs and their team members.

By theorizing the collective action problem in entrepreneurial teams and investigating the contingencies that mitigate individuals withholding of resources, our research makes two important contributions to the entrepreneurship literature. First, by extending collective action theories to the setting of entrepreneurial teams, we identify the conditions that might impede resource contributions. Even though collective action theories have been widely applied in the political realm, we know much less about whether and how holdup and free riding problems arise in the setting of entrepreneurial teams. Rather than assuming that team members make voluntary contributions of resources in small task-relevant groups, we explore the specific conditions that encourage team members' tendencies to free ride and withhold resources.

Second, viewing resource contributions within entrepreneurial teams as an accomplishment that requires considerable effort, we continue an emerging line of work by further theorizing about the mechanisms that can mitigate team members' withholding of resources (Ruef 2010, Kim et al. 2013, Hellmann and Thiele 2015, Hellmann and Wasserman 2016).

Such mechanisms have important implications for both theory and practice. They enrich our theoretical understanding of resource provision within teams by explaining the divergent consequences of adopting formal procedures versus relying on lead entrepreneurs' informal voluntary contributions. Practically, because most teams must rely on self-provision of resources in the initial start-up stage before external investors become involved, knowing the benefits and limitations of each approach helps entrepreneurs understand how to plan for acquiring resources internally (Hsu 2004, Beckman et al. 2007, Huang and Pearce 2015, Flammer and Kacperczyk 2016).

Theoretical Framework and Hypotheses
Obstacles to Resource Provision Within Entrepreneurial Teams

Entrepreneurs often bring cofounders aboard as a way of raising more resources, turning their ventures into collective efforts (Ruef et al. 2003, Beckman et al. 2007). Successfully mobilizing resources from team members is important because early-stage start-ups must rely on internal sources of capital until they have demonstrated enough viability to attract external financiers (Baker and Nelson 2005, Kim et al. 2013, Huang and Pearce 2015, Huang and Knight 2017, Wasserman 2017). The more that cofounders provide resources over and above the capabilities of the original founders, the greater is the chance that new ventures will reap the benefits of assembling a founding team. (Ruef 2003, Kim et al. 2013).

Some research has taken a positive view of team-based efforts, highlighting the advantages of multimember entrepreneurial teams over solo entrepreneurs. For example, studies have shown that entrepreneurial teams are more likely to have diverse skill sets, stronger social networks, improved capacity for innovation, and most important, larger initial endowments (Renzulli and Aldrich 2005, Stuart and Sorenson 2005, Beckman et al. 2007, Beckman and Burton 2008, Kim et al. 2013). By viewing resource contribution as a natural outcome of successfully assembling a team, these studies emphasize the many positive outcomes that entrepreneurs may achieve by drawing on collective resources during the founding process.

By contrast, a rising stream of research paints a more sobering view of entrepreneurial work (Fehr and Schmidt 1999, Hellmann 2007, Wasserman 2012, Hellmann and Thiele 2015, Hellmann and Wasserman 2016). Rather than seeing collective effort as an intrinsic feature of entrepreneurial teams, some scholars have begun to view resource mobilization as a challenging task that requires extraordinary efforts. For example, Hellmann and Wasserman (2016) emphasized the potential conflict in entrepreneurial teams between individuals' personal interests and the interests of the collective enterprise. They argued that entrepreneurs commonly face challenges in working with cofounders because they need to learn of each other's resource contributions and make contracts to ensure fair allocations (Hellmann and Thiele 2015, Hellmann and Wasserman 2016). Not only might cofounders withhold their resources because of their concerns about the fairness of equity allocations, but lead entrepreneurs might also hesitate in soliciting resources from cofounders because they fear becoming dependent on them, thus threatening their control of the business (Wasserman 2012, 2017). This stream of research recognizes the possibility of internal conflicts among team members and the challenges that entrepreneurs face in summoning collective efforts.

We extend this line of inquiry by formulating resource provision in entrepreneurial teams as a form of collective action. Drawing on the collective action literature, we note three reasons why collective action problems—holdup and free riding—may arise in entrepreneurial teams and undermine team efforts (Ruef 2010). First, entrepreneurial decision making has been depicted as managing unknowable risks: Entrepreneurs aim to achieve business success without knowing with certainty whether their business will work (Huang and Pearce 2015). Empirical findings assembled from a wide range of industries and national contexts confirm that the very early stages of the start-up process are extremely precarious, and only a quarter of nascent entrepreneurs continue their start-up attempts beyond five years (Stinchcombe 1965, Freeman et al. 1983, Aldrich and Yang 2012). Uncertainty in securing returns may lead individuals to withhold their personal resources until they observe satisfactory business outcomes generated by others' efforts.

Second, the venture-specific property of the resources required for creating successful new businesses heightens investment risks and thus increases individuals' tendencies toward free riding and withholding of resources (Ruef 2010). By *venture specific*, we refer to resources that are tailored specifically to the new business and, accordingly, are difficult to retrieve for use in other businesses (Williamson 1981, 1994; Schaefer 2009). Investment of venture-specific resources does not allow providers of resources to retain control and thus creates risks for them if the investment fails to produce expected outcomes (Rogerson 1992, Holmström and Roberts 1998, Foss et al. 2007, Ruef 2010). Team members are reluctant to part with many of the resources needed, such as financial resources and time, because they are specifically tailored to the new business and hard to redeploy for other uses.

Third, most emerging organizations lack a clearly defined division of labor or a reward system that relates members' contributions to payoffs (Aldrich and Yang 2014,

Bennett and Chatterji 2019). In his seminal work on collective action, Olson (1965) theorized that individuals are likely to free ride in social groups when they can rely on others to produce collective goods without making contributions proportional to the rewards they would share. Uncertainty about payoffs plagues entrepreneurial teams because most teams adhere to the principle of objective equity and allocate benefits equally among team members (Kahn et al. 1980, Hellmann and Wasserman 2016). For example, the analysis of Ruef (2010) of a representative sample of entrepreneurial teams in the United States showed that a majority of teams split ownership shares equally among team members. Similarly, in their study of technology start-ups, Hellmann and Wasserman (2016) found that decisions about equity splits are often made within the first few days. Even though the principle of objectively equity is followed to foster a sense of fairness and mutual trust within entrepreneurial teams, it may fail to provide strong incentives for individuals to contribute more and to impose sanctions when individuals' contributions fall short of expectations (Rogerson 1992, Ruef 2010).

The three conditions together produce a paradox of resource investment facing entrepreneurial teams. On the one hand, self-interested individuals seek to maximize their personal welfare, "possibly to the detriment of the rest of the group" (Ruef 2010, p. 116). On the other hand, the capacities of individuals to seek self-interested advantage are dependent on their access to other team members' resources (Aldrich et al. 2003, Aldrich and Ruef 2006, Kim et al. 2013). However, if everyone delays making personal contributions, the team runs the risk of underperforming and thereby magnifying individuals' concerns about wasting their resources. Thus, the reciprocal connection between drawing on individuals' resources to generate positive business outcomes and initially providing enough incentives to motivate such provisions constitutes an inherent challenge to collective efforts.

A few studies have suggested that entrepreneurs may intentionally limit resource contributions from others, such as cash investments, so that they retain a majority share of the ownership (Wasserman 2017). Entrepreneurs may also selectively receive certain types of resources from cofounders based on their expectations about the task roles that the cofounders will play (Kim et al. 2013). Despite such expectations, to the extent that lead entrepreneurs believe that the cofounders' contributions will lead to more resources, they will search for ways of encouraging them to make their best efforts. Failure to do so may limit a firm's ability to grow. For example, Wasserman (2017) demonstrated that entrepreneurial founders who limited cofounders' contributions so as to maximize

their own control were likely to decrease the value of their businesses. Based on the premise that additional effort from team members may serve as a catalyst for entrepreneurial success, we now turn to an examination of two approaches that entrepreneurs might pursue to mitigate the tension between their personal interest and the collective enterprise.

The Original Founder's Initial Contributions
Much of the literature on resource provision within entrepreneurial teams has focused on formal contracts as one way to ensure resource contributions (Hellmann 2007, Wasserman 2012, Hellmann and Thiele 2015, Hellmann and Wasserman 2016). While noting that entrepreneurial ventures may adopt formal contracts for *external* reasons—to increase their legitimacy and attract outside funding (Delmar and Shane 2004, Kim 2006)—scholars have also argued that early-stage emerging businesses often adopt formal contracts to settle *internal* governance issues (Hellmann 2007, Hellmann and Thiele 2015, Hellmann and Wasserman 2016, Wasserman 2017, Hellmann et al. 2019). For example, following the insight that the unstructured settings of early-stage businesses impose a liability of newness, Sine et al. (2006) argued that adopting formal contracts could ensure payoffs to contributors by increasing team members' contributions.

Formal contracts may be particularly effective at preventing free riding and the holdup problem in entrepreneurial teams because binding agreements mitigate concerns about expropriation and assure team members that their investments will be rewarded according to the contacts. For example, in a series of studies, Hellmann (2007), Wasserman (2012), Hellmann and Thiele (2015), and Hellmann and Wasserman (2016) have explored how to configure asset allocations and make equity contracts that best motivate resource contributions. Written documents impose formal structures on a new business through rules and principles that codify the new organization's practices and specify expectations for how much each individual should contribute (Meyer and Rowan 1977). In addition, teams that adopt files "preserved in their original or draft form" (Weber 1968, p. 957) to construct their new businesses may make individuals more accountable for their roles and responsibilities by prescribing enforceable sanctions when initial investments or subsequent efforts fall short of expectations (Ruef 2010, Kotha and George 2012). Even when contracts among members of early-stage start-ups do not fully specify precise levels of expected efforts (Williamson 1981), the symbolic act of signing a formal ownership agreement increases the salience of the economic benefits and highlights a team's reliance on each individual's contribution (McIlwee and Robinson 1992).

As an informal *alternative* to creating explicit contracts, we propose that entrepreneurs may forestall team members' withholding of resources and encourage collective efforts by making more voluntary contributions early in the start-up process (Sine et al. 2006). Blau (1964), and other classical exchange theorists, such as Lévi-Strauss (1969) and Ekeh (1974), have argued that complex activities require sequences of repeated social exchange of valued resources. They posited that initial positive actions taken by some individuals will lead others to develop favorable perceptions of the group and orient their behaviors accordingly. Positive emotions generated by some individuals' commitments to producing collective goods will foster perceptions of the emerging group as a cohesive unit. Constructive exchange relations, in turn, encourage others to make their own contributions (Lawler et al. 2000, Molm et al. 2006, Schaefer 2009).

Applying the same logic, we argue that in situations where free riding and future bargaining deter team members from providing resources early on, lead entrepreneurs who are willing to risk their personal interests will be more likely to encourage their team members' contributions than will hesitant and stingy entrepreneurs. By going beyond the simple provision of resources, lead founders can make an especially strong impact on a team's social order by providing venture-specific resources. Because providers of such resources incur substantial risk, provision of such resources might be perceived as a convincing signal of a lead founder's commitment to the business (Belenzon et al. 2017). For example, prior research suggests that a key marker of commitment to starting a new business occurs when founders give up their former jobs and begin working full time on their new ventures (Reynolds and Curtin 2009, Bennett and Chatterji 2019). Devoting most of their working week to a start-up without clear economic returns marks a major turning point for entrepreneurs. Similarly, investing more than $5,000 has been found to encourage entrepreneurs' subsequent efforts within start-ups significantly, whereas a smaller amount has no effect (Yang and Aldrich 2017). These findings suggest that if free riding and future bargaining restrain team members from providing resources early on, lead entrepreneurs' probabilities of successfully eliciting contributions from others will depend heavily on their own contributions. Therefore, we propose the following hypothesis.

Hypothesis 1. *The greater the initial contributions of resources by lead entrepreneurs, the greater is the likelihood their team members will contribute resources.*

Negotiated Exchange and Reciprocal Exchange

Our earlier argument has suggested that the lead entrepreneurs' voluntary contributions serve as an informal mechanism for encouraging resource contributions from other team members, complementing the formal contracts proposed by prior research. Although the relative strength of the two mechanisms—formal and informal—may vary across contexts, we hypothesize that the setting of entrepreneurial teams reveals limits to the effectiveness of formal agreements. Specifically, when individuals face an inherent tension between protecting personal interest versus creating collective goods, formal contracts may guarantee resource provision but nonetheless fail to encourage team members to contribute to their full potential. We argue that although enacting formal contracts to govern relations between members *directly increases* contributions by strengthening members' beliefs in the certainty of benefiting from their contributions, creating formal contracts may *indirectly* dampen the potential effect of the founder's contributions because they no longer appear voluntary.

In developing our argument, we focus on two types of exchange relationships between entrepreneurs and their team members: *Negotiated* and *reciprocal* exchanges. In negotiated exchange, actors engage in explicit bargaining in which they negotiate the terms of the exchange and specify the benefits for each exchange partner. By contrast, in reciprocal exchange, actors voluntarily provide resources or make contributions that benefit others "without knowing whether or when or to what extent others will reciprocate" (Molm et al. 2000, p. 1399). Actors may initiate exchanges by performing a beneficial act for others, but the specific returns to their initial contributions are neither specified nor guaranteed (Emerson 1962, Blau 1964, Lévi-Strauss 1969). Whereas entrepreneurial teams that adopt formal contracts may be more likely to conduct negotiated exchange, teams that do not start with formal contracts but rely instead on founders' voluntary contributions may be more likely to engage in reciprocal exchange (Molm et al. 2000).

A key difference between the two types of exchange relationships within teams lies in their different capacities to foster trust. *Trust* can be best understood by differentiating it from *assurance* (Yamagishi and Yamagishi 1994). Assurance refers to expectations of an exchange partner's behaviors based on knowledge of an incentive structure that encourages such behavior rather than exploitation, whereas trust refers to expectations based on inferences about a partner's personal traits and intentions (Molm et al. 2000, 2006). Negotiated exchange, with its imposed guarantees, provides assurance because the exchange is secured with conditions that make the agreement binding:

The actors face no risk that the exchange partners will break the terms of the agreement. For example, signing a formal contract is a commonly used mechanism for providing assurance, such as legal contracts that mandate sanctions for violations of agreements (Delmar and Shane 2004). For entrepreneurial teams, adoption of formal contracts ensures resource provisions from the lead entrepreneurs and the team members through explicit negotiations and binding agreements.

By contrast, reciprocal exchange, wherein actors separately contribute resources without knowing in advance whether others will reciprocate, may foster greater mutual trust among exchange partners. Although voluntary contributions entail substantial personal uncertainty and risk, the risk and uncertainty inherent in such contributions may signal the actor's commitment to producing collective goods while risking personal interest (Emerson 1962, Blau 1964, Lévi-Strauss 1969). Studies conducted in experimental settings show that social actors' provision of resources without the explicit quid pro quo of transactions or the assurance of binding agreements is more likely to be perceived as demonstrating trustworthiness and thus create positive responses from others (Molm et al. 2000).[1] Accordingly, trust is more likely to develop when exchange occurs *without* explicit negotiations or binding agreements.

Applied in the setting of entrepreneurial teams, this logic implies that when lead entrepreneurs' initial contributions represent a voluntary act beneficial to the collective enterprise, they are very likely to encourage team members to make contributions. However, for the lead founders' contributions to represent a voluntary act, such contributions must be made without a negotiated formal agreement. Although formal contracts guarantee investments from every individual ex ante, they simultaneously bind team members to the predetermined terms and thus limit the likelihood that members will voluntarily invest more than initially expected. A paradox is thus revealed: Formal structures may inhibit team conflicts over contributions, but their very existence dampens the potentially positive effect of founders' contributions. Based on these arguments, we propose the following hypothesis.

Hypothesis 2. *Lead entrepreneurs' initial contributions of resources will be more likely to encourage team members' contributions of such resources in reciprocal exchanges than in negotiated exchanges.*

Data, Measures, and Method

Testing our hypotheses regarding the antecedents of resource provision in entrepreneurial teams is empirically challenging. First, early-stage businesses are generally not visible to researchers, and they are difficult to observe on a large scale (Yang and Aldrich 2012, Davidsson 2016). Thus, most investigators who wish to study emerging organizations use registration data that only include new ventures that survived long enough to be recorded and that only partially cover new ventures' lifespans (Aldrich et al. 1989, Kalleberg et al. 1990). Second, longitudinal data on new businesses are extremely rare. According to the review by Reynolds and Curtin (2007), only 7 of 26 relevant data sets for research on entrepreneurship provide longitudinal information on new venture creation, and none of these seven data sets used selection criteria that would lead to a representative sample of emerging organizations. Third, these empirical challenges are compounded to the extent that information on entrepreneurial teams is difficult to collect, especially concerning individual member's resource contributions.

To overcome these challenges, we use data from the PSEDII, which tracks a representative sample of entrepreneurial teams for six years in the United States from 2005 to 2011. Beginning in the early 1990s, Reynolds and Curtin (2009) demonstrated that it was possible to rigorously identify nascent entrepreneurs who are attempting to start new businesses. The resulting panel research design was eventually called the Panel Study of Entrepreneurial Dynamics I. Based on what investigators learned from that study, an improved research design was created for PSEDII, with more effective screening questions for identifying entrepreneurs and their co-owners.

The research design for the PSEDII consisted of two phases. In the first phase, a representative sample of 31,845 individuals living in the contiguous 48 states and the District of Columbia was screened in 2005 to identify nascent entrepreneurs. Opinion Research Corporation phoned households as part of a national survey that involved contacting 1,000 adults (500 females and 500 males, 18 years of age or older) each week. When an adult aged 18 years or older was identified and agreed to respond to the survey, a screening interview was conducted to identify nascent entrepreneurs using a set of three general qualification questions. If respondents said "yes" to at least one of the three questions, three additional questions were used to ascertain whether the individual had taken any action in creating a new business, whether he or she would share ownership of the new business, and whether the new business had become a fledging firm. About 87% (1,214) of those identified as entrepreneurs agreed to participate in the study (Reynolds and Curtin 2009).

In the second phase, the University of Michigan Institute for Social Research conducted full interviews to collect information on all the entrepreneurs. During the phone interview, respondents were asked

to identify individuals who had helped them create the new business: Owner-founders and other individuals who have contributed to the start-up but do not share any ownership in the nascent business (Xu and Ruef 2007, Kim and Longest 2014). Regarding cofounders, the respondents were first asked, "How many people will legally own this new business—only you, only you and your spouse, or you and other people or businesses?" If respondents indicated that others would share ownership in the venture, they were asked to identify up to five people who would have the highest level of ownership. Respondents were then asked to provide information about each cofounder and the resources that each provided. Similarly, respondents were asked to identify up to five significant contributors who will not have an ownership share but "have made a distinctive contribution to the founding of this new business" as well as helpers who "have provided significant support, advice, or guidance on a regular basis to this (new) business." Such questions combined provide rich information on resource contributors to new businesses.

Sample

In our analyses, we will focus on entrepreneurial teams based on the number of owner-founders—individuals who share ownership of a business (Ruef et al. 2003, Burton et al. 2009, Yang and Aldrich 2014). We made the decision based on theoretical and empirical reasons. First, there has been a well-established tradition in sociological research to focus on entrepreneurial teams of owner-founders (Ruef et al. 2003, Ruef 2010). As Kim and Longest (2014, p. 801) pointed out, owner-founders "form the nucleus of the venture" because they are the primary contributors of resources for the new businesses and because they are much more likely to be involved in the daily operation of the new businesses (Xu and Ruef 2007, Kim and Longest 2014, Yang and Aldrich 2014). In contrast, contributions from nonowners are more marginal, and the interactions among nonowners are not "as intensive, regular, or systematic as they can be among co-owners" (Kim and Longest 2014, p. 801). Even when nonowners provide resources to a new business, their contributions are made as a form of social support in contrast with investment or responsibilities that best characterize the owner-founders' contributions. Second, the sampling methodology used by PSEDII leads to a representative sample of entrepreneurial teams of owner-founders. As we explained earlier, a respondent would be identified as an entrepreneur only if he or she met all four of the selection criteria, one of which asks if the respondents will share the ownership of the businesses that they are creating. Because a representative sample of entrepreneurial

teams is crucial for producing unbiased estimates, we will use teams of owner-founders in our analyses.

Nearly half the new businesses in the PSEDII are owned by multiple owners, typically two or three owners. Among the multimember teams, 66% are mixed sex teams, 28% are all male teams, and 6% are all female teams. In contrast to the high proportion of mixed sex teams, 82% of entrepreneurial teams are same race groups, and the clear majority (87%) of the same race groups consist of white individuals. These results are consistent with previous findings that entrepreneurial groups are highly homogeneous in terms of race and ethnicity but heterogeneous in terms of gender (Ruef et al. 2003; Ruef 2010, chapter 4).

A few principles guided our creation of the final sample for the analyses. First, because our hypotheses concern cofounders' resource contributions, we included all cofounders in our analyses. Second, we included cofounders from the teams for which we could identify the lead entrepreneur. This means that we excluded cofounders from teams for which we could not differentiate the lead entrepreneur from team members (e.g., 9% of multimember teams reported that everyone jointly manages the daily operation of the new business). The first two principles led to a selection of 769 cofounders from 515 multimember teams for our sample. Third, we used individual-year observations to analyze yearly resource contributions made by team members, and thus the sample includes 1,401 individual-year observations before cases were right censored. Because we wanted to model team members' resource contributions based on the lead entrepreneur's initial contributions, we further restricted the sample to individual-year observations in the years following the initial interview, resulting in 641 observations. Listwise deletions of missing values further reduced the sample size to 491 individual-year observations. We used individual-month observations to analyze whether a team member had started to work 35 hours per week for the business, and the corresponding sample includes 6,997 individual-month observations. After listwise deletions were applied, our final sample for time investment includes 5,475 individual-month observations.

Dependent Variable
Resources Contributed to the Business by a Cofounder.
The PSEDII asked questions regarding resources provided by *each* owner-founder, the lead entrepreneur, or a *co-owner*-founder. First, a question in every wave asked about the amount of financial resources invested each year by an owner-founder. Second, in every wave, a question asked in what months an owner-founder was working for the start-up for more

than 35 hours per week. Based on the two questions, we create two dependent variables, one for each type of resource: (1) The financial contributions by a *co-owner*-founder to the venture (in individual-year units) and (2) whether a *co-owner*-founder works full time (in individual-month units). When there is more than one co-owner-founder, separate observations are created for each co-owner.

Notice that the information about the amount of financial resources is updated yearly, whereas the information about time investment is updated monthly.[2] Accordingly, the longitudinal analysis for financial contributions has individual-year observations, whereas the analysis for time investment has individual-month observations.

In our analyses, we will focus on the amount of financial resources and the likelihood of working full time for two reasons. First, prior research has repeatedly shown that time and money significantly affect the survival and performance of early-stage businesses (Yang and Aldrich 2012, 2017). Our analyses of the PSEDII confirm such a pattern. Second, financial resources and full-time employment in the business reflect substantial effort from the provider and are exactly the types of venture-specific resources that are difficult to be redeployed for other uses. The provision of these two types of resources, time and money, is more likely to be plagued by free riding and holdup than other types of resources. These problems are highly relevant to our hypotheses about how lead founders motivate resource contributions within entrepreneurial teams.

Independent Variables
Formal Contracts. Adopting written documents that signal teams' commitment to prescribing individual members' contributions is measured by whether owners had signed formal agreements regarding their ownership. Respondents were first asked, "Once this business is operational, what proportion of the ownership will you have?" They were then asked whether and when the team had signed an agreement regarding this ownership share. We used these questions to create a time-varying binary indicator of whether the team had signed a formal contract by the current month in which an investment by a cofounder is made.[3]

Resource Contributions from the Lead Entrepreneur.
To create these measures, we first identified the lead entrepreneur. The PSEDII provides two possible ways for identifying the lead entrepreneur. First, we know whether a business emerged from an owner's own idea, an owner's current or previous work activity, an owner's hobby or recreational past time, academic research, or ideas from other team members. This question allows us to identify whether an individual

initiated the business. Second, we know which owner oversees daily operations of the new business. Respondents were asked, "Which of the owners would be considered in charge of day to day operations of the new business?" and whether (1) one individual owner is in charge, (2) several owners jointly are in charge, or (3) all owners are equally in charge. Respondents could report multiple lead entrepreneurs, but only 9% of multimember teams had more than one owner taking the lead. This finding is consistent with previous research suggesting that leadership in task groups is typically assumed by a single individual in order to improve decision-making efficiency and meet social traditions regarding internal authority (Gould 2002). The two measures are highly correlated, with the original founder likely to be the person in charge of the business's daily operation. We experimented with both measures and report the results from analyses using who oversees the daily operations of the new business to identify the lead entrepreneur. Results using the other measure are similar.

After we identified the lead entrepreneur, we created measures for the lead entrepreneurs' initial contributions of financial resource and their time investment: (1) The amount of initial financial resources contributed by the lead entrepreneur in the first year and (2) whether the lead entrepreneur worked more than 35 hours per week for the start-up.

Control Variables
We first control for five indicators of human capital: (1) Years of work experience in the same industry in which the new firm is created, (2) years of managerial experience, (3) start-up experience indicated by the number of other new businesses created, (4) the highest level of education that an owner has completed,[4] and (5) years of full-time paid work experience. The first three measures directly concern task competence relevant to leading or managing new businesses, which has significant effects on new ventures' performance and survival (DeTienne and Cardon 2012). Education and general paid work experience are not specific to the context of starting new businesses, but they are credentials indicating basic human capital qualifications in capitalist labor markets (Pager and Shepherd 2008). Our analyses take an inclusive approach, considering both general and specific human capital variables. We also control for the percentage of ownership held by each owner, owner's gender, and age.

In addition to individual characteristics, we also control for the social relationships between team members, which may affect the amount of resources contributed by individuals to the business. We differentiate six types of entrepreneurial teams based on

the relationships among individuals: (1) Only spousal relationship, (2) spousal relationship and family relationship, (3) spousal relationship and friendship, (4) friendship, (5) family relationship, and (6) strangers. We use spousal teams as the reference group and create a dummy variable for each of the other types.

Next, we control for a range of business characteristics. We control for the number of months since a new business has conducted its first start-up activity because business stage may affect the likelihood of adopting a formal agreement (Davidsson 2016). Because the PSEDII asked questions about whether and when entrepreneurs have conducted a start-up activity for 52 types of start-up activities, we are able to identify how long the new business creation process has been underway. We also control for a few variables that measure the type of the new business and the current performance and competitiveness of the new business given that the lead entrepreneur's contribution and the team members' contribution may both are dependent on the observed quality of the new business. First, we control for whether there are many other businesses offering the same product or service to the new business's potential customers. Second, we control for whether the new business is a high-technology business. Third, we control for whether the new business is an independent venture. Fourth, we control for whether a new business has made any profits.

Finally, we control for the lead entrepreneur's perception of the future performance of the new business, which may be correlated with the lead entrepreneur's own contribution as well as team members' contributions. Lead entrepreneurs were asked whether they expect the new business to be as large as possible or just a size "to manage by self or with key employees." We control for the expected annual revenue when the business is in the fifth year of its operation. In addition to expected revenue, we control for the expected firm size in the fifth year of its operation: The number of managers or employees that the lead entrepreneur expected to hire for the business.

Descriptive results for all variables are presented in Table 1. Panel A of Table 1 presents the descriptive statistics for the individual-year observations used for the analysis of financial contributions within team. Panel B of Table 1 presents the descriptive statistics for the individual-month observations used for the analysis of time investment within teams. We also present the correlation tables in the online appendix.

Results
We begin by examining patterns of resource contribution within entrepreneurial teams to show the extent to which team members withhold their resources in comparison with the lead entrepreneurs. We then test

our hypotheses by investigating two conditions that may motivate team members to make such contributions: (1) Lead entrepreneurs have made initial contributions and (2) formal contracts have been signed.

Resource Provision Within Entrepreneurial Teams
Our descriptive analysis compares lead entrepreneurs' and team members' probabilities of providing resources. As shown in Figure 1, lead entrepreneurs invest more resources across the board than co-owner-founders. Regarding time investment, Figure 1 shows that about 34% of lead entrepreneurs work full time for the business, whereas only 18% of other team members work full time for the business. Although lead entrepreneurs and team members appear equally likely to contribute financial resources to the venture in Figure 1, the lead entrepreneurs invest more financial resources than cofounders. Figure 2 displays the actual amount of financial resources provided. At almost every stage of the start-up process, lead entrepreneurs contribute more financial resources than other founders. Together these results provide preliminary evidence for team members' withholding of resources. They lend preliminary support to our argument that resource contributions do not happen spontaneously following the assembling of a team. Instead, lead entrepreneurs must exert considerable effort to elicit contributions. We next turn to conditions that may facilitate resource provision from team members.

Contributions by Lead Entrepreneurs
Our first hypothesis posited a condition under which team members will be more willing to contribute resources: When lead entrepreneurs contribute such resources early on (Hypothesis 1). Our second hypothesis (Hypothesis 2) concerns the effect of such a condition in the presence of formal contracts, positing that initial contributions from lead entrepreneurs will stimulate team members into making more proportional contributions when teams do *not* sign formal ownership agreements. Recall that our descriptive results have shown preliminary evidence that team members tend to withhold financial resources and that they are reluctant to commit to full-time work. In testing our hypotheses, we explain how entrepreneurial teams might motivate team members to contribute such resources.

We will first examine whether lead entrepreneurs' contributions (Hypothesis 1) encourage team members to contribute *financial resources*. Because we have longitudinal data (individual-year observations) on financial resources contributed by each co-owner-founder, we use a generalized estimating equation (GEE) to analyze the amount of financial resources that each co-owner-founder contributed in the years

Table 1. Descriptive Statistics

Variables	Mean	SD	Median	Variables	Mean	SD	Median
			Panel A: Financial contributions (N = 491 individual-year observations)				
Signed a formal agreement (0/1)	0.19	0.39	0.00	*Number of owner founders*	2.93	1.15	2.00
Age of the start-up (months)	77.07	80.32	57.50	*If many businesses offer same product* (0/1)	0.27	0.44	0.00
An independent start-up (0/1)	0.83	0.37	1.00	*Involves technology* (0/1)	0.27	0.45	0.00
Want the business to be large (0/1)	0.29	0.46	0.00	*Expected number of employees in the fifth year*	68	1,263	1
Expected annual revenue in the fifth year	2,659,647	12,236,007	150,000	*Have achieved positive cash flow* (0/1)	0.17	0.38	0.00
Characteristics of a team member				Characteristics of the lead entrepreneur			
Male (0/1)	0.57	0.50	1.00	*Male* (0/1)	0.65	0.48	1.00
% of ownership share	44.81	94.18	35.00	*% of ownership share*	55.69	95.47	50.00
Age	45.61	14.69	46.00	*Age*	44.51	13.06	44.00
Average years of work experience in the industry	7.51	10.52	2.00	*Average years of work experience in the industry*	11.09	12.17	6.00
Average years of education	3.31	1.17	3.00	*Average years of education*	3.39	1.15	3.00
Average years of work experience with pay	19.79	12.60	20.00	*Average years of work experience with pay*	21.56	13.05	21.00
Average number of start-ups created	0.77	1.26	0.00	*Average number of start-ups created*	1.04	1.65	1.00
Average years of managerial experience	11.13	11.00	10.00	*Average years of managerial experience*	10.80	9.96	9.00
Financial contribution ($)	14,592	50,656	200	*Financial contribution* ($)	21,057	60,302	3,000
Team types, %				Task roles, %			
Spousal teams	37.17			*General management*	27.17		
Teams of spouse and relatives	3.95			*Sales/marketing/customer service*	25.47		
Teams of spouse and friends	19.24			*Finance/accounting*	13.77		
Teams of relatives	18.75			*Technical/research/science*	11.13		
Teams of friends	10.36			*Manufacturing/operation*	10.38		
Teams with strangers	10.53			*Administration/human resource management*	12.08		
			Panel B: Time investment (N = 5,475 individual-month observations)				
Signed a formal agreement (0/1)	0.35	0.48	0.00	*Number of owner founders*	3.07	1.22	3.00
Age of the start-up (months)	42.69	34.25	33.00	*If many businesses offer same product* (0/1)	0.29	0.45	0.00
An independent start-up (0/1)	0.28	0.45	0.00	*Involves technology* (0/1)	0.28	0.45	0.00
Want the business to be large (0/1)	0.80	0.40	1.00	*Expected number of employees in the fifth year*	38	865	2
Expected annual revenue in the fifth year	10,068,595	57,497,157	250,000	*Have achieved positive cash flow* (0/1)	0.26	0.44	0.00
Characteristics of a team member				Characteristics of the lead entrepreneur			
Male (0/1)	0.57	0.50	1.00	*Male* (0/1)	0.71	0.45	1.00
% of ownership share	40.12	81.60	33.00	*% of ownership share*	52.80	80.88	50.00
Age	43.95	13.49	44.00	*Age*	44.64	12.91	45.00
Average years of work experience in the industry	5.24	8.83	1.00	*Average years of work experience in the industry*	10.51	11.62	6.00
Average years of education	3.40	1.15	3.00	*Average years of education*	3.47	1.13	3.00
Average years of work experience with pay	19.91	12.61	20.00	*Average years of work experience with pay*	22.16	12.82	20.00
Average number of start-ups created	0.99	1.84	0.00	*Average number of start-ups created*	1.42	2.14	1.00
Average years of managerial experience	10.85	10.83	8.00	*Average years of managerial experience*	13.00	10.57	10.00
Work full time for the business (0/1)	0.01	0.11	0.00	*Work full time for the business* (0/1)	0.29	0.46	0.00
Team types, %				Task roles, %			
Spousal teams	33.36			*General management*	23.56		
Teams of spouse and relatives	3.05			*Sales/marketing/customer service*	24.99		
Teams of spouse and friends	25.93			*Finance/accounting*	19.68		
Teams of relatives	16.59			*Technical/research/science*	11		
Teams of friends	10.54			*Manufacturing/operation*	8.01		
Teams with strangers	10.53			*Administration/human resources management*	12.77		

Notes. Variables with (0/1) indicate binary variables that take value of either 0 or 1. SD, standard deviation.

Figure 1. (Color online) Self-Provision of Resources in Entrepreneurial Teams

Types of Resources Ever Contributed Since Founding
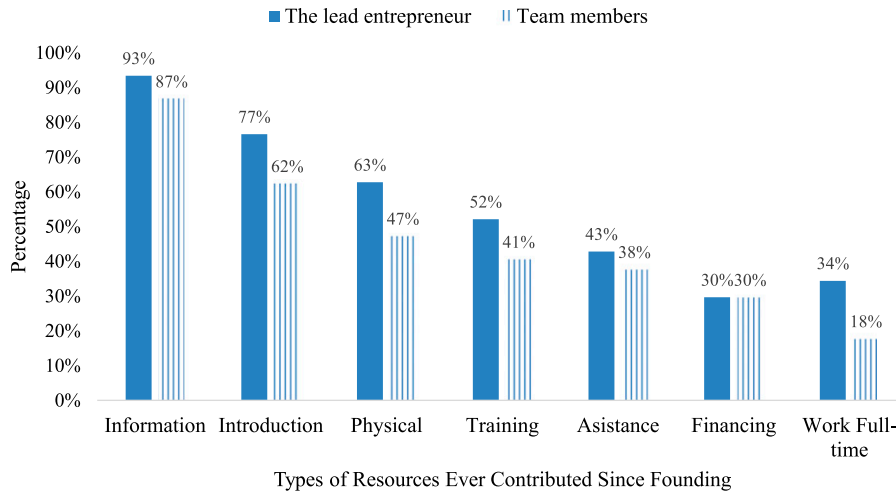
following the first year of business operation. The GEE approach uses robust standard errors to account for correlations between yearly observations on the same individual, which makes it a popular alternative to generalized linear mixed models that are more sensitive to covariance structure specification.

In Table 2 (Models 1–3), we predict team members' resource provision in ensuing years based on two initial conditions: How much lead entrepreneurs invested in the first year and whether the team has signed a formal agreement. Our analysis shows that the lead entrepreneur's initial financial contribution has a substantively large effect on team members' contributions of financial resources in succeeding years, supporting Hypothesis 1. For example, for each \$1,000 that the lead entrepreneur invests additionally in the venture, team members will on average contribute \$440–\$450 more. However, these models also show that signing an agreement does *not* have a statistically

significant effect on team members' provision of financial resources.

In Model 4 of Table 2, we test Hypothesis 2 by including the interaction of formal contracts and the lead entrepreneur's initial contributions. We treat formal contracts as a manifestation of negotiated exchanges and initial contribution by the lead entrepreneur without formal contracts as a voluntary act and thus a stimulus to foster reciprocal exchanges. With the inclusion of the interaction terms, the main effects of signing formal contracts and the lead entrepreneur's initial financial contribution are now statistically significant: They substantially increase team members' financial contributions to the venture. We also found a significant negative effect for the interaction of the two conditions, indicating that the effects of the lead founders' contributions heavily depend on whether a team signs a formal agreement, thus supporting Hypothesis 2.

Figure 2. (Color online) Amount of Financial Resources Contributed by Entrepreneurs and Their Team Members
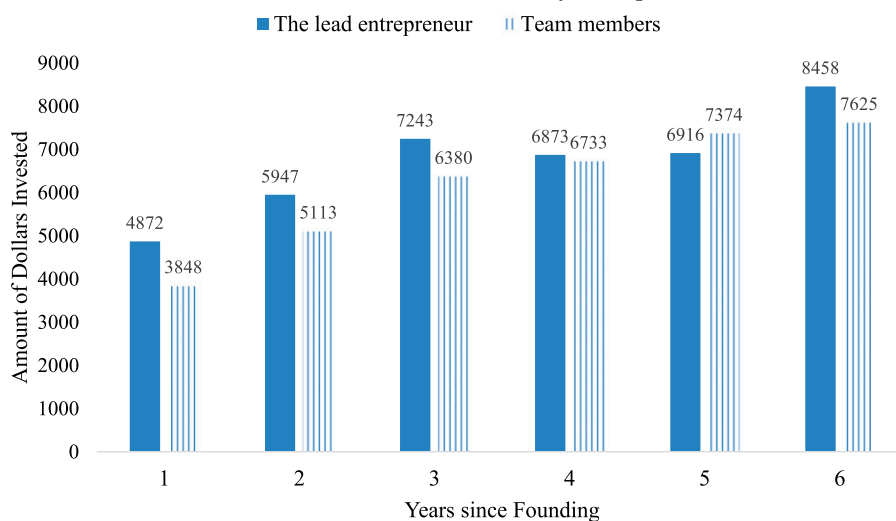

Years since Founding

Table 2. Effects of Formal Contracts and the Lead Entrepreneur's Financial Contribution

	Dependent variable: *A member's subsequent financial contribution*, $			
Variable	Model 1	Model 2	Model 3	Model 4
Initial financial contribution by the lead entrepreneur ($)		0.447***	0.444***	0.619***
		(0.032)	(0.033)	(0.036)
Sign an agreement (0/1)			4,123.266	19,179.133***
			(5,533.218)	(5,335.558)
Sign an agreement × Initial financial contribution by the lead entrepreneur (lagged)				−0.585***
				(0.066)
Team member's characteristics				
Male (0/1)	−9,301.477	−4,946.063	−5,296.690	−6,087.331
	(6,220.203)	(5,128.239)	(5,152.642)	(4,711.616)
Share of business ownership (%)	329.144	355.753	380.722	507.445*
	(342.654)	(281.973)	(284.114)	(260.141)
Age	−762.785**	55.792	47.233	147.461
	(295.855)	(250.566)	(250.969)	(229.725)
Years of work experience in the start-up industry	−110.204	133.204	132.668	129.033
	(296.512)	(244.632)	(244.770)	(223.780)
Level of education	4,915.203	3,119.123	3,323.568	2,398.175
	(2,584.899)	(2,131.056)	(2,149.828)	(1,968.231)
Years of work experience with pay	460.784	148.378	154.731	106.501
	(330.681)	(273.052)	(273.338)	(249.957)
Number of businesses created before	−4,304.797*	−9,489.839***	−9,478.452***	−11,628.362***
	(2,524.241)	(2,110.822)	(2,112.060)	(1,946.073)
Years of managerial experience	1,017.382***	719.712**	712.715**	421.541
	(363.690)	(300.052)	(300.366)	(276.561)
Lead entrepreneur's characteristics				
Male (0/1)	20,429.823***	13,239.834**	13,347.129***	6,701.586
	(6,209.262)	(5,135.982)	(5,140.878)	(4,759.286)
Share of business ownership (%)	−271.429	−304.488	−260.974	−139.174
	(296.420)	(243.932)	(250.957)	(229.846)
Age	788.187	93.640	107.322	−51.287
	(475.108)	(394.181)	(394.830)	(361.413)
Years of work experience in the start-up industry	−979.558***	−707.895***	−736.831***	−564.301***
	(279.927)	(231.187)	(234.554)	(215.319)
Level of education	−2,127.737	−726.253	−853.328	−425.511
	(2,632.846)	(2,168.914)	(2,176.820)	(1,990.728)
Years of work experience with pay	−1,025.900**	−906.459**	−900.896**	−782.678**
	(453.075)	(372.930)	(373.214)	(341.469)
Number of businesses created before	−2,976.284*	−1,059.600	−1,157.250	−53.215
	(1,613.649)	(1,335.085)	(1,342.246)	(1,233.429)
Years of managerial experience	1,549.947***	1,413.534***	1,421.026***	1,605.548***
	(398.299)	(327.905)	(328.242)	(300.813)
Age of the start-up (months)	71.632**	33.354	35.750	19.021
	(34.488)	(28.515)	(28.712)	(26.317)
Number of owner founders	947.498	−962.636	−335.111	−864.749
	(5,994.573)	(4,934.805)	(5,008.867)	(4,579.716)
Constant	−4,222.647	−1,389.790	−6,974.003	−15,763.224
	(38,808.317)	(31,935.584)	(32,820.441)	(30,022.233)
Team characteristics	Yes	Yes	Yes	Yes
Individual-year observations	491	491	491	491
R^2	0.17	0.44	0.44	0.53

Notes. Reference team type is spousal teams. Standard errors are in parentheses. Relationships between team members are included in the models but are not shown because of limited space.
   *$p < 0.1$ (two-tailed tests); **$p < 0.05$ (two-tailed tests); ***$p < 0.01$ (two-tailed tests).

Specifically, lead entrepreneurs' contributions have a strong independent effect: Team members contribute $620 more with every additional $1,000 provided by the lead founder. This relatively strong effect indicates a robust positive response by members to the lead founder's contributions. Meanwhile, the independent effect of formal agreements is also substantial: Making a formal agreement on ownership increases a cofounder's financial contribution by nearly $19,179. However, the negative interaction effect of the two conditions indicates that signing such an agreement almost eliminates the positive effect of lead entrepreneurs' resource contributions: After a formal agreement is in place, every additional $1,000 from the lead entrepreneur increases financial contributions from the team members by only $34, a substantively trivial effect. Without an agreement, lead founders' contributions make a substantial difference; with an agreement, they are nearly irrelevant. The extent to which the lead entrepreneur's contribution encourages team members' investments is strongly dependent on whether the team has signed a formal collective agreement about ownership.

Figure 3 plots the relationship between team members' and lead entrepreneur's financial contributions based on estimated coefficients from Model 4 of Table 2 for two groups: Ventures with formal contracts and ventures without. Figure 3 clearly shows that the effect of the lead entrepreneur's initial contribution is contingent on whether the team has signed a formal agreement regarding ownership by the current month in which an investment by a cofounder is made. When there is no formal contract governing resource provision, the lead entrepreneur's initial contributions are likely to generate proportional increases in team members' provision of resources: The more lead entrepreneur provides initially, the more team members will contribute subsequently. However,

when a formal contract has been adopted by the team, team members' contributions are essentially independent of the lead founder's and simply reflect the previously negotiated terms. Figure 3 reveals further details about the contingent effect of an ownership contract: Although having a formal structure can be beneficial to the venture in terms of generating reassurance for eliciting resources, such an approach is no longer ideal when the lead founder commits a large share of financial capital to the new venture from the outset: $32,800 or more.

We now turn to another type of venture-specific resource: Full-time work. We ran Cox proportional models to examine whether team members are more likely to work full time for the business when the team has signed formal contracts or when lead entrepreneurs have started to work full time themselves for the business. Table 3 shows that when the lead entrepreneur has begun working full time for the business, team members are nearly four times $(\exp(1.56) - 1)$ more likely to also work full time. By contrast, across all models, we find that signing a formal contract does *not* significantly affect whether team members fully devote their work time to the business. This finding echoes the insight of Coser (1974) that time has become a scarce resource in modern society. Existing commitments to family and work consume so much time that individuals involved in starting new businesses can seldom commit to working full time in the early phases of a new venture. Thus, formal contracts rarely call for full-time commitments. Indeed, transactions involving time may be deemed repugnant because people view contributions of time and money differently. However, if team members observe the lead entrepreneur working full time, their reluctance to commit to the venture evidently declines. One possible explanation is that team members may infer founder commitment to the

Figure 3. (Color online) Team Members' Contributions of Financial Resources
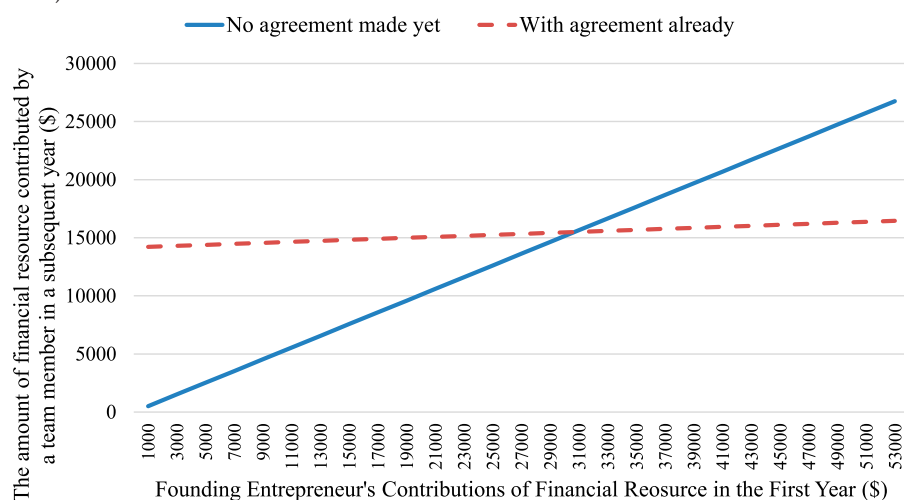
Table 3. Effects of Formal Contracts and the Lead Entrepreneur's Time Investment

	Dependent variable: *Team member starts to work >35 hours per week*				
Variable	Model 1	Model 2	Model 3	Model 4	Model 5
The lead entrepreneur has worked full time for the start-up (0/1)		1.563***	1.593***	1.631***	1.601***
		(0.265)	(0.268)	(0.329)	(0.347)
Sign an agreement (0/1)			−0.265	−0.202	0.063
			(0.318)	(0.448)	(0.465)
Sign an agreement × Lead entrepreneur has worked full time for the start-up				−0.111	−0.206
				(0.563)	(0.597)
Team member's characteristics					
Male (0/1)	0.061	0.052	0.073	0.070	−0.211
	(0.298)	(0.303)	(0.303)	(0.304)	(0.326)
Share of business ownership (%)	0.006	0.013	0.013	0.013	−0.010
	(0.015)	(0.008)	(0.008)	(0.008)	(0.017)
Age	−0.062***	−0.063**	−0.064**	−0.064**	−0.051**
	(0.023)	(0.025)	(0.025)	(0.025)	(0.024)
Years of work experience in the start-up industry	0.054***	0.064***	0.064***	0.064***	0.042**
	(0.015)	(0.016)	(0.016)	(0.016)	(0.018)
Level of education	−0.213	−0.252*	−0.244*	−0.243*	−0.058
	(0.140)	(0.143)	(0.145)	(0.145)	(0.157)
Years of work experience with pay	0.043*	0.032	0.032	0.033	0.029
	(0.022)	(0.024)	(0.024)	(0.024)	(0.023)
Number of businesses created before	−0.058	−0.007	−0.006	−0.005	0.048
	(0.088)	(0.089)	(0.087)	(0.088)	(0.091)
Years of managerial experience	−0.022	−0.012	−0.012	−0.012	−0.014
	(0.019)	(0.019)	(0.019)	(0.019)	(0.021)
Lead entrepreneur's characteristics					
Male (0/1)	−0.541*	−0.603**	−0.608**	−0.607**	−0.733**
	(0.285)	(0.288)	(0.289)	(0.289)	(0.309)
Share of business ownership (%)	−0.015	−0.011	−0.011	−0.011	−0.037**
	(0.015)	(0.008)	(0.008)	(0.008)	(0.017)
Age	0.019	0.020	0.019	0.019	0.030
	(0.025)	(0.026)	(0.025)	(0.025)	(0.028)
Years of work experience in the start-up industry	−0.035**	−0.040**	−0.039**	−0.039**	−0.024
	(0.016)	(0.017)	(0.017)	(0.017)	(0.018)
Level of education	0.004	0.148	0.144	0.148	−0.172
	(0.141)	(0.155)	(0.153)	(0.154)	(0.166)
Years of work experience with pay	0.000	−0.001	−0.003	−0.003	−0.005
	(0.023)	(0.024)	(0.024)	(0.024)	(0.026)
Number of businesses created before	0.115**	0.116**	0.119**	0.119**	0.049
	(0.050)	(0.049)	(0.049)	(0.049)	(0.062)
Years of managerial experience	0.009	−0.005	0.000	0.001	0.010
Controls for robustness checks	(0.021)	(0.022)	(0.023)	(0.023)	(0.026)
Quality of the business					Yes
Perception of the business					Yes
Role expectation for a cofounder					Yes
Individual-month observations	5,475	5,475	5,475	5,475	5,475
−2 log L	1,099.42	1,063.62	1,062.911	1,062.873	951.175

Notes. Analysis of maximum likelihood estimates. Standard errors are in parentheses. Relationships between team members are included in the models but are not shown because of limited space.

*$p < 0.1$ (two-tailed tests); **$p < 0.05$ (two-tailed tests); ***$p < 0.01$ (two-tailed tests).

venture by observing how many hours per week founders are willing to work. Team members might be unwilling to contribute resources unless lead founders prove that they are "all in" by pursuing it full time, in which case formal contracts concerning time commitment become irrelevant.

Together our results support our hypotheses that initial contributions of resources by lead entrepreneurs

have a substantively large effect on team members' provision of resources (Hypothesis 1) and that such reciprocal exchanges are more likely to emerge when the resource exchanges are not prescribed by negotiated terms (Hypothesis 2). In contrast, we found contingent support for the argument that signing a contract encourages team members to invest more financial resources up to an inflection point of about $32,800. When lead entrepreneurs provide more than that amount, signing a formal contract does not encourage team members to proportionally increase their contributions as lead entrepreneurs continue to invest money into the business. We find no effect of formal contracts, however, on team members' time investment. In terms of time investments, team members are most swayed by the hours put in by the lead founders.

Additional Analyses

We consider several additional analyses as robustness checks to provide additional evidence in support of our argument and to rule out alternative explanations.

Other Signals of Entrepreneurial Commitment. We argue that financial resources from the lead entrepreneur's voluntary contributions send signals about the entrepreneur's commitment, mitigating concerns about the prospects of the new business and encouraging team members to make similar contributions. To bolster our argument, we sought other signals of entrepreneurial commitment that might moderate the effect of the lead entrepreneur's resource contribution. We considered two competing hypotheses about the moderating effect of alternative signals. On the one hand, when there are other signals of entrepreneurial commitment, we might expect the signaling effect of financial resource to be smaller. On the other hand, other signals of entrepreneurial commitment may strengthen team members' beliefs in the lead entrepreneur's degree of commitment. By contrast, signals that entrepreneurs lack of commitment may counteract the effect of financial resources, leading team members to question whether the lead entrepreneurs are truly committed. Thus, whereas additional signals of entrepreneurial commitment could amplify the effects of resource contributions from lead entrepreneurs, signals indicating a lack of commitment may provoke doubts and thus reduce the effect of the lead entrepreneur's resource contributions.

One potential alternative signal of entrepreneurial commitment is whether lead entrepreneurs have quit their wage jobs to work for the new business. We use this condition to conduct our first robustness check. As shown in Model 1 of Table 4, when the lead

entrepreneurs kept their wage job, every additional $1,000 from them only encourages team members to contribute $237 more. However, when lead entrepreneurs have quit their wage jobs, every additional $1,000 from them encourages team members to contribute $764 more ($237 + $527). Our finding suggests that additional signals of entrepreneurial commitment reinforce the impression that the lead entrepreneurs are risking their personal interests for the collective good. Lead entrepreneurs elicit more financial resources from members if they quit their wage jobs and begin working on the new business as their only job. By contrast, if lead entrepreneurs keep their full-time jobs, they substantially weaken the signaling effects of their own resource contributions and thus have a smaller effect on members' contributions.

Quality of the Business or Perception of the Business. We assume that lead entrepreneurs' contributions signal their willingness to risk their personal resources for the new business and that such revealed commitment, in turn, encourages other team members to contribute more. A possible alternative explanation for the resource contributions made by the entrepreneurs and their team members might be that they perceive the businesses as having greater potential for success than lower-quality businesses that they have refused to join. To mitigate concerns that the quality of the business drives both the lead entrepreneur's and the team members' contributions, we conduct a second robustness check by controlling for the quality of the new business.

In Model 2 of Table 4, we control for variables that measure the current performance and competitiveness of the new business: (1) Whether there are many other businesses offering the same product or service to the new business's potential customers, (2) whether the new business is a high-technology business, (3) whether the new business is an independent venture, and (4) whether the new business has made a profit. In Model 3 of Table 4, we further control for the lead entrepreneur's perception of the future performance of the new business, which may be correlated with the lead entrepreneur's own contributions as well as team members' contributions: (1) The lead entrepreneur expects the new business to be as large as possible rather than just a size "to manage by self or with key employees," (2) the expected annual revenue when the business is in the fifth year of its operation, and (3) the expected firm size in the fifth year of its operation: The number of managers or employees that the lead entrepreneur expects to hire for the business.

Our results are not affected by adding these controls. Indeed, after controlling for these diverse measures for the objective and perceived quality of

Table 4. Additional Analyses and Robustness Checks

Variable	Dependent variable: Team member's subsequent financial contribution, $			
	Model 1	Model 2	Model 3	Model 4
Initial financial contribution by the lead entrepreneur ($)	0.237***	0.602***	0.605***	0.589***
	(0.050)	(0.034)	(0.036)	(0.036)
Sign an agreement (0/1)	17,503.971***	15,619.932***	17,533.599***	17,852.435***
	(4,919.338)	(5,355.307)	(6,110.746)	(6,008.908)
Sign an agreement × Initial financial contribution by the lead entrepreneur (lagged)	−0.479***	−0.489***	−0.518***	−0.496***
	(0.071)	(0.077)	(0.081)	(0.081)
Quit their wage job (0/1)	−4,034.712	7,988.864**	8,958.321**	10,399.269**
	(3,875.412)	(3,913.767)	(4,154.353)	(4,186.565)
Quit wage job × Initial financial contribution by the lead entrepreneur (lagged)	0.527***			
	(0.058)			
Controls for robustness checks				
If many businesses offer same product (0/1)		8,763.025**	8,320.168*	5,461.372
		(4,123.173)	(4,397.839)	(4,429.529)
Involves high technology (0/1)		−1,253.431	−1,892.444	474.669
		(4,176.039)	(4,464.700)	(4,504.009)
An independent start-up (0/1)		19,159.877***	17,281.039***	16,572.089***
		(5,598.761)	(6,137.836)	(6,148.802)
Have achieved positive cash flow (0/1)		−5,608.662	−6,388.175	−5,496.153
		(4,886.305)	(5,333.694)	(5,275.981)
Want the business to be large (0/1)			1,546.275	797.936
			(5,002.642)	(5,028.511)
Expected annual revenue in the fifth year			0.000	0.000
			(0.000)	(0.000)
Expected number of employees in the fifth year			−0.568	−0.847
			(1.191)	(1.173)
Sales, marketing, or customer service				−21,153.971***
				(5,856.217)
Finance or accounting				−12,741.243*
				(6,662.940)
Technical or science related				−11,497.004*
				(6,835.470)
Manufacturing or operations				−25,663.296***
				(7,532.442)
Administration or human resources				−16,842.976**
				(7,166.255)
Team member's characteristics	Yes	Yes	Yes	Yes
Lead entrepreneur's characteristics	Yes	Yes	Yes	Yes
Team characteristics	Yes	Yes	Yes	Yes
Constant	11,442.869	−40,954.595	−42,122.753	−23,328.768
	(26,703.631)	(29,992.612)	(31,871.708)	(32,309.904)
Individual-year observations	491	491	491	491
R^2	0.62	0.57	0.57	0.59

Notes. Reference team type is spousal teams. Standard errors are in parentheses. The lead entrepreneur's characteristics, a team member's characteristics, and relationships between team members and team characteristics (number of owner founders and age of the start-up in months) are included in the models but are not shown because of limited space.
  *$p < 0.1$ (two-tailed tests); **$p < 0.05$ (two-tailed tests); ***$p < 0.01$ (two-tailed tests).

the new business, the effect of lead entrepreneurs' contributions on financial resources contributed by team members becomes larger, with each additional $1,000 from the lead entrepreneur encouraging a cofounder to provide an additional $602–$605. This result contradicts the alternative explanation that our results stem from higher-quality businesses attracting greater contributions from both lead entrepreneurs and cofounders.

Role Expectation for a Cofounder. One possible explanation of team members' limited resource contributions is that they were expected to play a minor or specific role, and therefore, the lead founders had

low expectations regarding the other members' contribution of financial resources or their full-time commitment. Kim et al. (2013) discussed task role expectations based on social relationships. For example, family members are expected to provide instrumental or financial support, whereas friends and non-family members are expected to provide informational support, such as making an introduction or providing some information. Our analyses have taken such social relationships into account by controlling for the relationships between team members. We differentiated six types of teams: Spousal teams, teams with spouse and friends, teams with spouse and relatives, teams with only family members, teams with only friends, and teams with strangers. Adding this level of social role specificity allows us to claim that regardless of the relationships among team members, our results show how formal and informal structures adopted by entrepreneurial teams affect cofounders' contributions.

There might be another type of role expectation based on professional "task roles" specified for the team members. It might be that people playing certain roles are not expected, as cofounders, to contribute financial resources: For example, a chief technology officer cofounder might be expected to mainly provide knowledge rather than money to the venture. Alternately, the lead founder simply may recruit the cofounder to work for him or her through wage compensation, thus naturally not requiring financial resource provision from the cofounder.

The PSEDII provides some leverage on this issue because it asks about everyone's primary task role in the business. More specifically, it asks an individual's "primary role in the (new) business—would you say it is general management, sales, marketing, or customer service, finance or accounting, technical or science related, such as research or engineering, manufacturing or operations, or is it administration or human resource management?" Creating a categorical variable, we included the control for a cofounder's primary task role in the business in Model 4 of Table 4. The results do indicate that cofounders tend to invest less when their primary task roles involve specialized tasks rather than general management. However, the inclusion of these controls does not affect our findings regarding the independent and joint effects of the lead entrepreneurs' contributions and formal contracts.

Experiences of Entrepreneurs and Team Members. We have argued that signing an agreement suppresses the effect of lead entrepreneurs' contributions because it limits the team's possibility of developing reciprocal exchanges. An alternative explanation of our findings is that signing a formal agreement simply reflects the extra precautions taken by team members.

That is, when team members are more careful with their investments, they are more likely to take formal measures by signing an agreement, and at the same time, they are less likely to provide resources. Although we do not have direct measures for whether individuals are precautious, a reasonable assumption to make is that when individuals are more experienced with start-ups, they are more likely to prepare a formal agreement to guard against risk.

We take advantage of the rich information on prior start-up experience in the PSEDII to assess this possibility. Notice that all our models included a variable for the lead entrepreneur's prior start-up experience and a variable for each team member's prior start-up experience. In addition to these two variables concerning prior start-up experience, our models also included other work experience variables, including years of managerial experience, years of industry-specific experience, and years of managerial experience. Thus, with the inclusion of these controls, we are confident that the effect of signing an agreement lowers the impact of the lead entrepreneur's contribution primarily because the lead entrepreneurs' contributions are less likely to be perceived as a voluntary act in the presence of negotiated terms or binding agreements.

Similarly, we ran these additional analyses for time investment (Model 5 in Table 3). Our results were the same: Team members are much more likely to work full time for the new business when lead entrepreneurs have taken the lead by quitting their jobs to work full time on the business.

Discussion

Much of the previous research on entrepreneurial teams has studied resource acquisition in the entrepreneurial process and highlighted how multimember entrepreneurial teams may have an advantage over solo entrepreneurs. An emerging line of research has begun to pay attention to problems affecting resource provision *within* entrepreneurial teams (Fehr and Schmidt 1999; Hellmann 2007; Wasserman 2012, 2017; Hellmann and Thiele 2015; Hellmann and Wasserman 2016). Extending this line of work, we analyze a unique representative sample of entrepreneurial teams, the PSEDII, to investigate the formal and informal venture structures that encourage team members to make contributions and the ways that lead entrepreneurs compensate for free riding and holdup problems within their teams.

We examined the specific resources contributed by lead entrepreneurs and their early team members. We found that the lead entrepreneurs have trouble raising resources tailored specifically to a new business, such as by asking members to commit to full-time work and make financial contributions. Our theory

posited that the cofounders tend to withhold resources because of concerns about securing returns to their investment, but we considered two other possible explanations. First, the limited contributions of cofounders might reflect the lead entrepreneur's reluctance to depend on others for resources and their attempts at retaining a lion's share of business ownership (Wasserman 2017). Second, it is also possible that team members contributed limited venture-specific resources primarily because they were expected to play a minor or specific role, and therefore, the lead founders had low expectations regarding the other members' contributions of time or money (Kim et al. 2013). However, our analyses suggest that these two alternative explanations are unlikely to account for our finding.

Among the teams in our data, about three-quarters split business ownership equally among team members, and about 30% signed formal contracts. These results contradict claims that these naturally forming groups of nascent entrepreneurs are unwilling to share equity with their cofounders compared with entrepreneurs who rely heavily on external investment early on (Wasserman 2017). Moreover, our results suggest that even when team members follow the objective equity principle to equally divide ownership shares, cofounders tend to provide fewer resources than lead entrepreneurs. Indeed, we found that cofounders tend to provide fewer resources across the board, regardless of the type of resource. Thus, we interpret our results as suggesting that although teams might be assembled with a goal of mobilizing resources collectively, cofounders tend to withhold their resources because of potential concerns about securing returns to their investment. However, such reluctance might not be fatal to new ventures *if* entrepreneurs can overcome that hesitancy through the structures they adopt for their ventures (Sine et al. 2006, Hellmann and Thiele 2015, Hellmann and Wasserman 2016).

In searching for mechanisms that mitigate collective action problems in entrepreneurial teams, we hypothesized that the informal structure of voluntary initial contributions made by lead entrepreneurs might encourage team members to make greater contributions. Our focus on the informal structures adopted by teams complements prior research that has exclusively studied formal contracts as a way to mobilize resources (Fehr and Schmidt 1999; Hellmann 2007; Wasserman 2012, 2017; Hellmann and Thiele 2015; Hellmann and Wasserman 2016). Regarding financial resources, we found that greater financial contributions from lead entrepreneurs have a large positive effect on team members' provision of such resources. However, signing a formal contract offsets the effect of the lead entrepreneurs' contributions, suggesting that lead entrepreneurs' contributions are more likely to encourage

proportional provision of similar resources when such contributions are made voluntarily without negotiated terms (Molm et al. 2000, 2006; Schaefer 2009). Formal contracts provide reassurance and facilitate resource provision by specifying rewards and sanctions, but they limit opportunities for reciprocal exchange, the type of exchange that is more likely to encourage cofounders' contributions proportional to the lead entrepreneurs' contributions.

An important caveat regarding formal contracts is that our analyses focus on early-stage and emerging new ventures that rely heavily on internal resources. More specifically, the nationally representative sample that we analyzed includes mostly new small ventures that do not pursue formal investments from venture capitalists/angels, especially in their early stages (Ruef 2010, Kim et al. 2013). The vast majority of these ventures are small, mundane, and ordinary businesses rather than high-technology ventures (Kim and Longest 2014). However, entrepreneurial teams that pursue resources from external investors may also adopt formal contracts to increase the organization's legitimacy and to avoid negative evaluations by outsiders judging that the business owners lack sophistication.[5]

These two reasons for adopting formal contracts could render formal contracts less effective at eliciting resources within such teams but more effective at attracting outside investors. This suggests that the effects of formal contracts on resource provision may vary depending on the source of the financial resources. Furthermore, in our analyses, among the businesses that have signed formal agreements during the five-year observation window, about 65% of the teams made formal agreements in the first year, and 86% made agreements by the third year. Our analysis showed that the timing of adopting such contracts does not affect our finding regarding resource provision within teams in a substantive way, perhaps because most agreements were made early and because most new ventures were terminated within a few years. However, as new ventures grow beyond the initial stage and resources are no longer forthcoming from team members, teams may then seek external resources. At that point, having formal contracts might have a decreasing effect on internal funding but an increasing effect on external funding.

Regarding time investments, our results show a limited effect of signing a formal contract while highlighting the substantial impact of the lead entrepreneur's contributions. Our finding that a formal contract does not significantly increase the likelihood of a team member's full-time work in the business suggests that time investment is rarely specified in formal contracts unlike general role assignments, such as business development or technical support. Several mechanisms may

account for this finding. First, people might be less willing to specify time contributions than financial contributions in formal contracts because of social preference concerns or perhaps because of the scarcity of time as a resource in modern society. It is also common for new ventures to start as secondary jobs for most cofounders given the high risk and the low success rate of early-stage businesses. Second, enforcement mechanisms regarding contracted time commitments may be weak. Tracking time at work is difficult: Most new businesses lack the human resource capacity to manage it, and the quantity of hours invested does not necessarily translate into the quality of time contributed. Consequently, the limited scope of formal contracts regarding time commitment may explain why the mere presence of formal contracts does not guarantee time contribution from team members.

These results suggest that different dynamics within entrepreneurial teams may generate distinct types of social exchange relationships and thus shape the amount of resources that team members will contribute. Unlike negotiated exchange, which generates reassurance but suppresses opportunities for developing a strong sense of trust, reciprocal exchanges initiated by the lead entrepreneur's voluntary contributions are more likely to generate greater resource contribution from team members (Molm et al. 2000). Although the *confidence-signaling effect* of a lead founder's early contributions represents a potential competing mechanism to our reciprocal exchange reasoning, such a mechanism cannot explain the negative interaction effect between voluntary cofounder contributions and the presence of a formal contract. Consequently, we focus on trust as a more plausible mechanism for our empirical findings. In the context of entrepreneurship, reciprocal exchanges are more likely than negotiated exchanges to induce trust and affective commitment among team members. Although negotiated exchange can guarantee some level of contribution from team members, the terms specified in a contract may undermine the lead entrepreneur's efforts to foster trustworthy bonds among founders. As a result, lead founders may face a trade-off between using formal contracts to elicit substantial early investments from members and putting off formal agreements with the hope of generating stronger bonds within the team that eventually lead to greater contributions.

Contributions

Our study uses entrepreneurial finance, founding team dynamics, collective action theory, and social exchange theory to develop a theoretical framework for explaining resource provisions within entrepreneurial teams. Our findings make important contributions to each of those research areas.

First, with respect to entrepreneurial finance, our study directs new attention to the underexplored self-provision of resources within entrepreneurial teams. Prior research has mostly focused on financial support from external sources, such as venture capitalists and angel investors, with limited consideration of contributions from lead founders and founding team members themselves (Hsu 2004, Beckman et al. 2007, Kerr et al. 2011, Kim et al. 2013, Kim and Longest 2014, Huang and Pearce 2015). However, ample evidence shows that most start-ups rely on entrepreneurs' self-provision of resources, at least in the very early stage, before they become fledging entities (Baker and Nelson 2005). We fill in the gap in the literature on entrepreneurial finance by demonstrating that the internal self-provision of resources has important implications for these ventures' overall outcomes and, furthermore, that several contingencies affect the extent to which early team members contribute resources.

Second, drawing on theories of collective action, we highlight the work of scholars who noted the merits of considering collective action problems facing entrepreneurs in their pursuit of resources (Olson 1965; Ruef et al. 2003; Ruef 2010; Wasserman 2012, 2017). Entrepreneurship scholars have examined the advantages of multimember teams over solo entrepreneurs, whereas our results call attention to the free riding and holdup problems overlooked by prior research. Recent research has begun to reveal how internal conflict and equity split affect resource mobilization, but we await a fuller understanding of resource provision within entrepreneurial teams (Fehr and Schmidt 1999; Hellmann 2007; Wasserman 2012, 2017; Hellmann and Thiele 2015; Hellmann and Wasserman 2016). Continuing this vein of research, our findings highlight the paradox facing lead entrepreneurs: Creating a multimember team should help mobilize resources, but collective actions problems can prevent team members from making contributions. Lead entrepreneurs may have to contribute disproportionately to their own financial resources and time to prevent cofounders' free riding and withholding of valuable resources. Otherwise, such behavior may undermine the viability of the business.

Third, our findings establish a relatively new mechanism that entrepreneurs can establish to encourage resources but also reveal a condition under which such mechanism may become ineffective. Our results suggest that reciprocal exchanges are more likely to form and encourage resource contributions when the lead entrepreneur has made such contributions voluntarily. However, such positive dynamics in resource provision may be undermined by formal contracts that entrepreneurs adopt to ensure certain levels of resource provisions. Essentially, negotiated

and reciprocal exchanges may serve as substitutes for one another.

By investigating the importance of reciprocal exchanges for resource mobilization in entrepreneurial teams, our research reveals several subtle differences between naturally forming groups of entrepreneurs and teams that recruit members purely or primarily based on resource provision. A prominent feature of the teams included in the PSEDII is that they are naturally forming teams based on strong social relationships in contrast with teams that are formed based on the interventions and objectives of external investors (Kim et al. 2013, Hellmann and Thiele 2015, Hellmann and Wasserman 2016). As Wasserman and Alexander (2013) noted in their study of Apple's founding team, the strong relationship between original founders (Steve Wozniak and Steve Jobs) led them to rely on implicit norms and social obligations to value each person's contribution and divide equity. As teams become more formalized by adding people based primarily on their resources (such as Mike Markkula and Mike Scott mentioned in the case study in Wasserman and Alexander (2013)), they are more likely to turn to formal contracts for regulating members' contributions. Our findings emphasize the value of reciprocal exchanges for resource mobilization in small and autonomous teams.

Finally, we investigate the patterns of social exchange from its commonly studied settings in experiments and established organizations to an important yet underexplored setting: Entrepreneurial teams. Compared with task groups in established organizations, entrepreneurial teams involve less formalization of resource contributions because individuals mostly form task relations on their own without regulations imposed by managers or supervisors. Similarly, unlike task groups in experimental settings where individuals are randomly assigned into groups, entrepreneurial teams are formed unreflexively, emerging from preexisting social relationships. As a result, entrepreneurial groups offer a unique setting for theorizing real-life scenarios that thwart resource contributions from individuals. Further research that delves more deeply into the links between social exchange and resource provision within entrepreneurial teams could deepen our understanding of how social principles that guide social exchange define resource contributions within small autonomous groups.

Limitations and Implications for Future Research

Our study has a few limitations. First, we examined the effects of negotiated and reciprocal exchange relationships on team members' contributions, but issues remain that future research could investigate more thoroughly. We found that the act of signing a formal agreement may not be enough to encourage desired resource exchanges; this suggests a need to unpack the specific negotiated terms in these formal contracts. Our data only allow us to identify instances of formal agreements regarding ownership share, not specific requirements for responsibilities, and they say little about enforcement of these contracts, such as sanctions when contributions fall short of expectations. Future studies should examine formal agreements with varying scope and intensity, particularly regarding imperfect enforceability. Future work might also consider different contract details, such as distribution of benefits, vesting terms for ownership share, noncompete terms on voluntary leave, decision making, operating procedures, and whether and how the agreements are updated. Discerning the nuances of various terms would provide more insight into the optimal design of formal contracts in new ventures.

Second, we conjecture that lead entrepreneurs' voluntary contributions induce subsequent contributions from team members by cultivating trust within a team and fostering reciprocal exchanges. We have tried to rule out some potential alternative explanations, including better venture quality and differential venture setup costs, but we recognize that trust level and team affection cannot be measured precisely with our data. This limitation may pose a threat to the contributions of our paper because we are not directly testing whether reciprocal exchanges are the mechanism for our empirical findings. Instead, we use the concept of reciprocal exchange versus negotiated terms as the theoretical foundation to derive the *conditions* that we test directly. Furthermore, trust within an entrepreneurial team can also be fostered through alternative mechanisms, such as family ties and social networks (e.g., through the formation of family/spouse/friend teams). We focus on a type of trust-based resource exchange that has the most generalizability for entrepreneurs who may lack such social capital and support. Future work could investigate which types of trust-based relationships are most effective in stimulating resource provision and benefiting a range of business outcomes, including but not limited to survival.

Third, our study focused on entrepreneurial teams that are formed autonomously to found new businesses, and most consist of only two to three team members. Nearly half of the teams are spousal teams, where wives and husbands jointly create new businesses. Our findings suggest that the holdup problem may even exist in spousal relationships. These findings are consistent with previous research on intrahousehold bargaining. For example, Bobonis (2009, p. 545) explicitly argued that "households are not perfectly harmonious entities in which individual preferences are subordinated to common goals

and in which resources go to a common pool and are then channeled toward the best uses of the family." A substantial body of research confirms that familial allocation decisions are affected by the resources that individual decision makers bring to the table (Schultz 1990, Thomas 1990, Duflo 2003). These theories suggest that not all spousal couples are harmonious entities in which wives and husbands invest their resources without considering their own self-interest. Instead, many couples explicitly consider self-interest as a criterion in making decisions affecting their households. In fact, our comparisons across team types also suggest that, on average, spousal teams are no more likely to volunteer resources than other teams.

These results validate an important assumption in our theory: Team members, regardless of their social relationships, do not start with *complete* trust or *perfect* assurance for everyone's investments. In other words, resource contributions within teams are efforts that team members must intentionally act on. Teams need to seek mechanisms—formal or informal—to govern resource contributions. Based on our findings, future research may further investigate how the relationships between spousal couples—their negotiations about financial resources and individuals' power relative to their spouse's—affect their ways of resource investment in family-owned businesses. Furthermore, the paradox that we theorize regarding resource provision may exist in other task-oriented groups.

Attempts to apply our argument to task groups in established organizations should consider the extent to which formal contracts imposed by employer organizations regulate and shape team members' resource contributions. On the one hand, task groups in established organizations are more likely to form without preexisting relationships, and therefore, voluntary contributions are less likely. On the other hand, established organizations may develop contracts that more thoroughly specify individuals' contributions and the proportional rewards. Extending our framework to such alternative settings may shed light on the conditions that amplify the importance of formal contracts.

Conclusion

Viewing entrepreneurship as a form of collective action, we examined the tension between an entrepreneurial team's reliance on collective efforts for achieving success and individual members' tendencies to withhold their personal resources. We argue that two conditions may help overcome collective action problems in entrepreneurial teams: (1) Adopting a formal contract to specify rewards and sanctions and (2) encouraging reciprocal exchange among team members through the lead entrepreneur's voluntary contributions. Our analyses of a representative sample

of entrepreneurial teams in the United States show that presigned formal contracts and founding entrepreneurs' initial contributions make members' contributions of such resources much more likely. However, an absence of binding agreements may better allow reciprocal exchanges to occur and, accordingly, facilitate resource contributions through developing deeper trust among team members.

Endnotes

[1] Asian countries often have strong norms for reciprocal exchanges among family members, and individuals who attempt to ensure return to their support to family members through negotiated terms are often considered too calculative and less trustworthy (Peng 2004). Another example is that many emerging new businesses intentionally avoided bureaucratic principles at early stages; rather, they rely on supervisors' mentoring and peer influence to retain employees because employees are more likely to develop affective attachment to the start-ups. Simply, without binding agreements, employees would stay because they want to. With binding agreements, employees would stay because they have to (Tsui et al. 1997).

[2] Although interviews were conducted yearly, respondents were asked from which year and which week each individual member had begun to work full time for the new business. Based on the survey questions, we coded team members' work status in the start-up at a weekly basis.

[3] Among the teams that have signed formal contracts during the five-year observation window, about 65% of the teams made formal agreements in the first year, and 86% made agreements by the third year.

[4] We differentiated 10 levels of education: (1) Up to eighth grade, (2) some high school, (3) high school degree, (4) technical or vocational degree, (5) some college, (6) community college degree, (7) bachelor's degree, (8) some graduate training, (9) master's degree, and (10) law, MD, PhD, or EDD degree.

[5] We thank an anonymous reviewer for this point.

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Tiantian Yang is an assistant professor at Duke University. Her research examines the career antecedents and consequences of entrepreneurship and how inequalities in career attainment are (re)produced along gender and race lines.

Jiayi Bao is a PhD candidate in business economics and public policy at the Wharton School of the University of Pennsylvania. Her research focuses on human capital strategy and workplace diversity issues in different contexts of entrepreneurial forms and phases.

Howard Aldrich is the Kenan Professor of Sociology and an adjunct professor of business at the University of North Carolina at Chapel Hill. He won the Distinguished Contributions to Teaching Award from the American Sociological Association (ASA) in 2017 and the Rosabeth Moss Kanter Distinguished Career Award from the Organizations and Occupations Section of the ASA in 2018. He has honorary doctoral degrees from Mid-Sweden University and Bowling Green State University.