

SOCIAL NETWORK AND FAMILY BUSINESS: UNCOVERING HYBRID FAMILY FIRMS

October, 2020 © Ronald S. Burt*, Sonja Oppen**, and Na Zou***

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ACKNOWLEDGEMENT: This paper grew out of discussion at Zhejiang University for an MOR Research Frontiers Conference on family business, November 6-8, 2019, and the adjacent 15th International Symposium on Entrepreneurship and Family Business. Ronald Burt is grateful to the University of Chicago Booth School of Business for financial support during the work reported here, and to Arie Y. Lewin for his invitation to present the conference keynote address and Professor Xiaobo Wu, Dean of Social Science, Zhejiang University for financial support to attend the two conferences. Sonja Oppen is grateful to the Marianne and Marcus Wallenberg Foundation for support of this work, to Riksbankens Jubileumsfond for her sabbatical grant, and to the Center for East Asian Studies at the University of Chicago for hosting her as an Associate. We are all grateful to the Jan Wallanders and Tom Hedelius Foundation for the grant to Sonja Oppen that funded the fieldwork in China providing the data analyzed here.

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ABSTRACT

What does it mean for a private enterprise in China to be embedded in a family? Our purpose here is twofold: (1) use social network analysis to describe what it means for a firm to be embedded in a family, (2) reveal from the application a new kind of firm, not family, yet akin to family. Armed with data on a large probability sample of private enterprises — a third of which meet ownership and employment criteria of being family businesses — we uncover a category of “hybrid family firms” that look modern in the style of firms that exclude family, but operate socially in ways similar to family firms. Our conclusion from summary statistics on the sample is that there are no differences in average performance level or network advantage for the three categories of businesses: family firms, hybrid family firms, and family-excluded firms. The fact that CEOs of family firms and hybrid family firms more often turn to family as key business contacts is a fact about network composition that raises no question about network mechanisms. Whether the CEO turns to more or fewer family contacts, government help is more likely with stronger political connections, and business success and survival are more likely with a large, open network. That said, the look-modern, act-traditional hybrid family firms stand alone in prospering with a CEO embedded in a closed business network. Recognition of hybrid family firms adds to the literature’s illustrations of social network analysis used to distinguish types of businesses and business people, and extends the population of organizations within which governance and strategy are likely to be better understood when viewed through a family logic.

The theory of the firm proposed by Coase (1937), and later elaborated as resource dependence theory (Pfeffer and Salancik, 1978) and transaction-cost economics (Williamson, 1981), is a story about network embedding (Burt, 1992:chp. 7). Coase's entrepreneur decides between conducting certain business transactions under the rule of market logic or invoking corporate rule by embedding the transactions in a corporate bureaucracy. Family business adds another layer: Market and corporate logic are embedded in family logic. Of course, in the same way that individuals within a company can ignore company rules — behaving as if guided only by market rules — family members and trusted pseudo-family contacts can have a falling out in which family logic is put aside in preference for market or corporate rules. But the embedding logics can crop up at any time. The specific mix of market-corporate-family rules in an organization has inspired a number of empirical questions.

How does family limit or enhance an entrepreneur's business network? How prominent is family in the network of founders and entrepreneurs (Arregle, Batjargal, Hitt, Webb, Miller, & Tsui, 2015; Drakopoulou-Dodd, & Patra, 2002; Renzulli, Aldrich, & Moody, 2000)? Does family inhibit or encourage political connections in the network (Morck & Yeung, 2004)? What are the implications for organizational design (Cai, Li, Park, & Zhou, 2013), resource acquisition, and business success (Arregle et al., 2015; Bird, & Zellweger, 2018; Luo, & Chung, 2005)? These are central questions that have been addressed using data from a variety of different country samples.

But what does it really mean for a business to be embedded in family? The prevailing view is to look for family influence via formal control rights associated with ownership and agency by family employees such as an owner's spouse or intergenerational influence from an owner's children and related kin (Chua, Chrisman, & Sharma, 1999:20-22; Miller et al., 2007). Another less obvious dimension of family embeddedness rests on informal advice and resource networks involving family members (Arregle, Hitt, Sirmon, and Very, 2007). Both dimensions have broader

implications for family business operations, the network that builds up around the business, and the distribution of trust across the network. Yet, to date empirical research either involved measures of formal family governance (Bird, & Zellweger, 2018; Cai, Li, Park, & Zhou, 2013; Luo, & Chung, 2005; Morck & Yeung, 2004) or proxies of informal family involvement in entrepreneurial networks (Anderson, Jack, & Drakopoulou-Dodd, 2005; Arregle et al., 2015; Drakopoulou-Dodd, & Patra, 2002; Renzulli, Aldrich, & Moody, 2000). A comprehensive empirical approach combining formal types of governance with informal family social behavior inside or outside of the business is missing (cf., Chua, Chrisman, & Sharma, 1999), even though family embeddedness is generally understood as a multilayered and complex factor shaping the organizational capital of family firms (Aldrich and Cliff, 2003; Sharma, 2004).

With little authoritative evidence to draw on, it is unclear whether family embeddedness — broadly defined — correlates with network style. It is also unclear, whether the network-performance association hinges on the type of firm building a business network. With good reason, debate whether family firms are surrounded by and benefiting from network closure, or suffering from network disadvantage, has largely remained at a conceptual or macro level (Arregle et al., 2007; Zellweger, Chrisman, Chua, & Steier, 2019; for a focused discussion on East Asian firms see Chai and Rhee, 2010).

With this study we propose a novel empirical strategy that allows for a comprehensive evaluation of family embeddedness by combining formal governance mechanisms and informal types of family embedding. Further, we situate formal ties of governance and informal family ties within the broader social network of the business leader (Burt, 2019). In doing so, we move beyond the focus on dyadic relations between business owner and family members (Bird, & Zellweger, 2018; Cai, Li, Park, & Zhou, 2013; Luo, & Chung, 2005; Morck & Yeung, 2004) and beyond reliance on aggregate

measures of informal family representation within advice and resource networks (see for instance, Arregle et al., 2015).

Using a large area probability sample of private enterprises in the prosperous Yangtze delta region, our analysis proceeds in two steps. First, rather than starting out with a definition of what is formally regarded as a family firm, we analytically distinguish between nonfamily firms and family firms based on the network structure of their family embedding. Our analytical strategy begins with business characteristics relevant to family to see what background and network characteristics are associated with family firms as defined by standard definitions of ownership and agency. We then use those characteristics to distinguish businesses that are clearly not embedded in family. What emerges is a third category of businesses between the two extremes. The third category is composed of "hybrid" family firms — firms with formal ownership and governance similar to nonfamily firms, but relying on relational strategies resembling family firms such as reliance on family for recruiting employees and dealing with significant business issues.

Limited by cross-sectional data, we cannot say with certainty why, but our guess is that hybrids result from trying to build a modern business organization that under economic duress, or a faulty integration of corporate and family logics, falls back on family support. These hybrids might be a particularly Chinese phenomenon given the prominence of family metaphors in China's capitalism (Boisot & Child, 1996; Huang, 1990; Redding, 1990), or we might be detecting hybrids because we are observing the Chinese economy during rapid transition from its past (Peng, 2004; Nee & Opper, 2012; Lin, forthcoming; related, see Chung & Yeung, 2005 on the role of family in business transition in Taiwan), but such are empirical questions for future research. Meanwhile, recognition of hybrid family firms substantially broadens the number of Chinese private enterprises known to operate as family businesses (expanding family business in our sample by 77%, from 239 to 423 of the sample firms), and introduces hybrids as an

interesting category of a *de-facto* family business that operates under a colloid mix of Western and Chinese logics.

In a final analytical step, we test how the three categories of private firms (nonfamily, hybrid, and family firms) compare in terms of government support, business success, and survival. Specifically, we observe, whether differences in family embedding interact with the business network around the person running the business, and network structures associated with success. It turns out that family firms and hybrid family firms do not differ from nonfamily firms in terms of performance, here measured by the firm's ability to secure government support, business success and business survival. Yet, other than the pure forms (family firms and nonfamily firms), which both benefit from open network structures surrounding the entrepreneurs, hybrids do not generally benefit from open networks.

We proceed in five sections. Following an overview of what is known about Chinese business embedded in family, we introduce in the second section our sample data. Characteristics of the sample firms are analyzed in section three to distinguish businesses that are clearly family firms versus businesses that are clearly not and "hybrid" firms with characteristics of both extremes. In the fourth section of the paper we analyze the characteristics to make sense of what it means to be a hybrid family firm. In the fifth section, we compare the three categories of businesses — family, family-excluded, and hybrid family firms — to see how network mechanisms of success differ between the categories. We conclude discussing limitations and implications for future work.

FAMILY EMBEDDEDNESS OF CHINA'S PRIVATE ENTERPRISE

Family is prominent in Chinese business. A national survey of controlling owners of private enterprise conducted in 2008-2009 finds that wealthy families held more than 50% of the shares in 85% of the surveyed firms (China Family Enterprises Development

Report, 2011: 6). Of course, family investment alone does not define a family business, but the same report claims that 56% of private enterprises are family firms according to Miller's et al. (2007) definition based on family ownership and family involvement in firm governance (p. 6).

To get an initial account of what we already know about family business in China, we follow the convention of distinguishing family businesses as private enterprises run by an owner CEO subject to family influence either through the CEO's spouse being an employee or intergenerational family influence through one or more of the CEO's children being employees. We are fortunate to have Li et al.'s (2015) recent and thorough review of family firms in China. Many of the success factors for Chinese family firms are success factors for all of Chinese private small and medium enterprise (SME). Here we look for factors that distinguish family businesses from other firms with respect to the way family firms build their business networks, and to see how the emergent network styles contribute to firm success.

Business Network

To provide a sense of what we mean by the business network around a firm, Figure 1 displays the network around one of our sample businesses. We return to this figure in the data section, but for the moment note that the network consists of a set of key business contacts, data on the respondent's relations with those contacts, and data on relations among the contacts. With few exceptions (Batjargal, 2007; Xiao and Tsui, 2007; Burt and Burzynska, 2017), business networks around the people running private enterprises in China, let alone the heads of family firms, are not recorded with the level of detail displayed in Figure 1. We will be breaking new ground in having such network data for each of 700 firms when we compare family and non-family businesses.

Absent data at the level of detail displayed in Figure 1, there is published evidence and argument from which we can speculate in an informed way about the networks

around Chinese family firms. In an environment that favors state-owned enterprises regarding resource allocation coupled with weak legal and regulatory institutions, private enterprises depend on social networks (Yang, 2004, 2007; Nee & Opper, 2012). Kinship is an extreme form of social network — a group of people socially obligated to one another and socially distinct from people outside the family. Family provides a relatively safe environment with substantial reputation costs for bad behavior against other family members, and reputation cost within the group typically facilitates trust and cooperation within the group (Granovetter, 1985; Coleman, 1988, in sociology; Greif, 1989, in economics; Ellickson, 1991; Bernstein, 1992, in law; Putnam, 1993, in political science; review in Burt, 2005: Chps. 3-4). The stronger the cohesion within a group, the higher within-group trust and cooperation, which can make relations beyond the group feel especially risky (Burt et al., 2018; Burt et al., 2020; Opper & Burt, forthcoming). In a family business, therefore, family members can be expected to be especially desirable as employees for the trust and cooperation they bring, and senior managers can be expected to make a distinction between relations with family or pseudo-family versus non-family; the former subject to rules of trust and cooperation between family, and the latter subject to the usual “buyer beware” rules of the market. In short, we expect the networks around heads of family firms — relative to heads of non-family firms — to be more personal and more populated by family.

This image is consistent with bits of evidence from previous studies: In a 2008 mail survey of 902 private enterprises in eight cities in the Pearl River Delta and Yangtze River Delta regions, 38 of 225 self-designated family firms report that 80% of top management positions were occupied by family (Lu et al., 2015). Using data from a 2010 national mail survey of owner-operated private enterprises, Yang et al. (2018), report that 58% of family firms have more than three family members serving in top management positions. A face-to-face survey conducted in the provinces of Jiangsu and Zhejiang shows that about 82% of the 640 interviewed business leaders employed

related family. On average each firm employed more than three family members (Cai et al., 2010: 11). This does not imply that family members always occupy senior governance positions. The survey shows that 16% of about 1600 managers sampled in the same survey were related to company owners. However, *if* relatives occupy management positions they tend to enjoy more decision-making rights and authority than nonfamily managers (Cai et al., 2013). These insights are consistent with work by Burt, Bian & Oppen (2018), who find that family contacts within entrepreneurial networks enjoy more trust, and that entrepreneurs embedded in large families are less likely to trust bridge relations.

Evidence on family-firm relations beyond the firm is particularly thin and inconclusive. In support of the idea that family firms cultivate political connections, Dou et al. (2014) draw on a national survey of 2821 private enterprises conducted in 2010 to report that the share of family ownership is positively linked with a firm's charitable donations, but less so if there is no next generation in line to take over. A direct comparison between family firms and nonfamily firms corroborates these results. Ge and Micelotta (2019) use data from the same 2010 national survey and find that family firms—defined by ownership and family governance—donate more frequently and more generously than nonfamily firms. On the other hand, Burt and Oppen (2020), armed with a probability sample of 700 private enterprises in the Yangtze Delta region, find no evidence of stronger political connections for family firms versus nonfamily firms. Contingencies may explain part of the differences. Drawing on the 2006 version of the same national data collection used by Dou et al. (2014) and Ge and Micelotta (2019), Ge et al. (2019) find that heads of family firms are less likely to activate political ties to mitigate institutional uncertainties than heads of nonfamily firms. This effect is reinforced if succession plans are in place.

How ties of variable strength — inside and outside of the business — add up to business networks around the family owner(s) is largely unexplored, which is surprising

given the popular stereotype describing East Asian family business as a rather distinct, culturally shaped business model, typically associated with network closure around the business head (Chai and Rhee, 2010). Yet, systematic evidence is rare. Burt (2019, see Table 2) is a partial exception. Building on the same network data we employ here, his study finds that the CEO's of family firms (as defined by ownership and governance) are indeed more likely to build extreme partner networks than nonfamily firms. We show there are many dimensions to embedding a business in a family.

Business Success

Studying large and small firms in the United States, Miller et al (2007:829) conclude: “*Fortune* 1000 firms that include relatives as owners or managers never outperform in market valuation, even during the first generation. Only businesses with a lone founder outperform. Moreover neither lone founder nor family firms exhibited superior valuations within a randomly drawn sample of companies. Our results confirm the difficulty of attributing superior performance to a particular governance variable.”

In reviewing performance studies of Chinese family firms, we find no authoritative evidence to support a different conclusion about family firms in China. Argument can be made for and against family firms outperforming other firms. In support of higher performance by family firms, a distinction between trusted family insiders versus the rest of the world as outsiders could (1) enable a family firm to better preserve confidential information within the firm (Li, 2002) and (2) reduce operation costs and speed coordination in responding to the market, especially given the traditional concentration of control allowed the senior family leader (Farh & Cheng, 2000; Luo et al., 2013; Li et al., 2015), which could (3) manifest in indicators such as a higher yield on internal R&D (Deng et al., 2013) and higher returns on assets (Luo and Chung, 2013). On the other hand, the insider-outsider distinction likely in a family firm can erode coordination between managers and family members within the firm. Lu et al. (2015) report that family firms with top management dominated by family are less profitable in

internationalization, Liang et al. (2014) report that family involvement in management reduces the likelihood of international ventures, and Yang et al. (2018) report that higher family ownership diminishes a firm's probability and level of exporting (with the effect being stronger if the founder is still CEO, or succession is planned within the family). Finally, without going into the financial detail in Miller et al. (2007), Burt and Burzynska (2017:232) and Burt and Opper (2017:534n) find no growth or profit difference for family firms in a large probability sample of Chinese private enterprises, and Zhao and Burt (2018:385) report no family-firm advantage in surviving through the five years after the survey. Our summary conclusion is that there is no authoritative evidence on the business networks around family firms, and equivocal evidence on whether family firms perform better or worse than nonfamily firms. A shift to a broader account of family embeddedness is a promising next step.

A LARGE AREA PROBABILITY SAMPLE OF CHINESE PRIVATE ENTERPRISES

We have data from a 2012 survey of 700 CEOs whose firms constitute a stratified random sample of private enterprises in five manufacturing industries and seven cities within three provinces around the Yangtze River Delta: the independent municipality of Shanghai, Jiangsu province to the north, and Zhejiang to the south. The region gained recognition as a leader in terms of private firm development (Nee & Opper, 2012), with some evidence highlighting the traditionally strong role of family and kin in the development of new business ventures (Cai, Li, Park, & Zhou, 2013; Huang, 1990), especially at the founding stage (Burt & Opper, 2017; Zhao & Burt, 2018). In 2013, the combined production value of these three provinces was 20.2% of China's gross domestic product; and the combined import and export value accounted for 31.9% of foreign trade. The sample firms were founded between 1980 through 2009, around an average of 2000 (Nee & Opper, 2012: Chap. 2, and Bian, 2019: Chap. 4, provide succinct overview of foundings in the recent history of the Chinese economy). Two thirds

(65%) of the founders paid all start-up costs with their own money. Most of the other third were primary investors (29% of all founders paid less than all of their start-up costs, but they paid an average of 58%). Interviews were conducted in respondent offices by pairs of professional interviewers given extra training for this interview using network items. The interview asked for demographic data on the respondent and his or her family, details on business operation and performance, and rich data on the business network around the respondent. To distinguish family firms, we begin with Miller et al.'s (2007) widely-used definition: a family firm is run by its owner and employs the owner's spouse or child(ren). By this definition, 239 of the 700 sample businesses are family firms (34%).

Family

To qualify for the family-firm definition, a CEO has to have family. We do not have a complete work inventory of brothers, sisters, spouse and children, but we have some basic information. Table 1 contains a list of the 39 characteristics we considered for distinguishing family businesses. The first seven concern the CEO's family. Most have families that would make them eligible to be running a family business. Taking a quick look at families of origin, most of the CEOs came from families larger than is currently typical. The average CEO grew up with three brothers or sisters (58% have three or more siblings). Few were only children (7%). Most are married (97%), and their spouse (or partner) is employed (69%). Almost all of the CEOs have children (98%): the majority have one child (54%), a substantial minority have two (37%), and some have more (7%). As a reflection of China's one child policy introduced in 1979, older CEOs are more likely to have more children (mean ages 43, 49, and 55 respectively for respondents with one, two, or more children), and the more children a CEO has, the more likely one or more of the children works in the business (percent employing one of their children in the business increases 5%, 25%, 57% respectively for CEOs with one, two, or more children).

Business Organization

The CEO also has to be an owner to qualify as running a family business. There are a variety of ownership characteristics in Table 1 (characteristics 8 - 19). The majority of CEOs founded their business (80%). Many are sole owners (18%), and most own more of the business than does anyone else (74%). Only a few CEOs own none of the business (12%). Given some variation in how much a CEO owns, we consider variations in how ownership is distributed among other managers in the business, and outsiders. Most businesses are owned entirely by the CEO and other managers (78%), but there is a long tail in which outsiders own up to as much as 100% of the business

The remaining five organization characteristics in Table 1 (characteristics 20-24) concern family and friends. We distinguish whether it is the spouse/partner or child(ren) who are the family employed in the business. We distinguish businesses in which key suppliers or customers were located through family or friends. And we distinguish businesses in which the CEO explicitly recruits some or all employees based on family member recommendation.

Business Network

Our ambition in this paper is to know how family firms defined by ownership and family employees, versus nonfamily firms, are embedded in their social environment. The business network around each CEO is measured in the usual way by asking for the names of key contacts (people helpful in building and operating the business), then asking about the substance of the CEO's relations with each contact, and the strength of connections between contacts (Burt & Burzynska, 2017: Appendix). Such name-generator and name-interpreter questions are routine in network survey research (Marsden, 2011; Perry, Pescosollido & Borgatti, 2018), in network surveys of management populations in particular (Burt, 2010: pp. 281ff.), and have precedent in China (Ruan, 1998, the 2003 Chinese General Social Survey, Bian & Li, 2012; Xiao & Tsui, 2007; Batjargal et al., 2013).

A Large, Open Network

To illustrate the network characteristics distinguished in Table 1, we display three example networks. The network in Figure 1 is an example in which business is completely separate from family. The respondent CEO (square symbol) founded her business 22 years before the survey, and grew it to 800 employees by the time of the survey. She named nine business contacts, largely interconnected by close relations (thin line), with a few especially close relations (bold lines), and her right in the center of it. Contacts are close together in the figure to the extent that the relation between them is strong, and their relations with others are similar (spring embedding, Borgatti, 2002).

———— Table 1 and Figure 1 About Here ————

Six name generators were used in the survey. To stretch the network data back into a respondent's history, we asked about contacts associated with significant business events back to the firm's founding. All CEOs named a contact most valuable when the business was founded, then most named five subsequent events, and a person most valued for help during the event. People named in association with significant events we reference as "event contacts" (Burt & Opper, 2017). Significant events cited during the interview with the Figure 1 CEO are listed on a time line to the lower-left in the figure. Contact 1 was cited as the most valued person in founding the business. The market was opening in the early years of the business, and contact 2 was cited for her help in expanding with the market. Significant events continue across the time line, each event eliciting the name of a person most valued during the event. Some CEOs cite the same people again and again (illustrated below), but the CEO in Figure 1 named a different person for each event.

To describe "current" contacts, CEOs were asked to name the "three or four people who have been most valuable to your business activities this year," then the most difficult person this year, then the most valuable employee this year, wrapped up with a request for the names of any "particularly significant" for the business who had not been

yet named. As most valued current contacts, most valued employee, and most difficult person, the CEO in Figure 1 cited five people. A contact can be cited on more than one name generator, so it is often the case that a current contact is also an event contact (of 4,464 different people named as contacts, 65% are named as event contacts, 70% are named as current contacts, and 35% are named as both). Combining event and current contacts, the networks vary from three to 12 contacts around a median of six.

Name interpreters are survey questions that ask the CEO to describe relations with and among the cited contacts. We asked how long a CEO had known each contact, how often they meet with each contact, gender and role relations with each contact (family, neighbor, etc.), and their trust (信任) in each contact measured on a five point scale from “least trust” up to “highest trust.”¹ Contacts given a “highest trust” rating are marked in Figure 1. Two qualities stand out in Figure 1. One is that the network is active every day. The CEO meets all of her cited contacts daily (except the difficult person, contact 9). The second is that she built her network around three close friends from college. Contacts 1, 2, and 3 are all classmates, known for 35 years, which means this college-educated CEO met them while she was in college. They are the only people the CEO cites for “highest trust.” To scale relations, we asked CEOs whether their relation with each contact was “especially close,” “close,” “less close,” or “distant,” and asked them to describe whether the connection between each named contact was “especially close,”

¹The Chinese word “信任” in the trust question is a term as ambiguous in Chinese as “trust” is in English. Interviewers were trained to guide CEO queries about what we mean by trust in the following way: “Consider the extent to which you trust each of the listed people. For example, suppose one of the people asked for your help. The help is not extreme, but it is substantial. It is a level of help you cannot offer to many people. To what extent would you trust each person to give you all the information you need to decide on the help? For example, if the person were asking for a loan, would they fully inform you about the risks of them being able to repay the loan? If the person was asking you give a job to one of their relatives, would they fully inform you about their relative's poor work attitude or weak abilities, or other qualities that would make you prefer not to hire the relative?” In this situation, it is valuable to know for our network analysis that trust scores vary primarily within rather than between networks. Trust variance across relationships is 60% network differences within respondents, 10% individual differences between respondents, and 30% random error (Burt, Bian, & Opper, 2017).

“distant,” or something in between (“neither distant nor especially close”). It seems odd that the three classmates are not strongly connected with each other since they have in common meeting the CEO daily and all having close emotional ties with the CEO, but we do not know the social spheres in which they move, and the CEO reported modest connections between them.

Thus, each CEO’s network is a matrix of symmetric connections with and among contacts, with connections scaled to vary from zero to one (Burt & Burzynska, 2017: Appendix), from which we compute network metrics often used in studies of trust and performance (e.g., Burt, Kilduff, & Tasselli, 2013, for quick review). Size or degree is the number of contacts in a CEO’s network. Density is the average strength of connection among contacts, and network constraint is a summary measure of the extent to which the CEO is embedded in a closed network. We multiply constraint by 100 so we can talk in terms of points of constraint, whereas a constraint score of 100 indicates that a respondent’s contacts are strongly connected with one another (no access to structural holes). Constraint decreases toward zero with the extent to which a CEO has many contacts (network size or degree), increases with the extent to which the CEO’s network is closed by strong direct connections between contacts (network density), and increases with the extent to which the CEO’s network is closed by an individual through whom contacts are strongly connected indirectly (network hierarchy or centralization). The network in Figure 1 is relatively large and open in that nine cited contacts is more than average (1.77 z-score, top left in the figure), and the average strength of connections between contacts — density — is below average (-.76 z-score). Summarizing, the low score on network constraint shows that the CEO in Figure 1 is relatively unconstrained by connections among his business contacts (-1.38 z-score). Previous work with the data used here shows that organizations led by people with less constrained networks are more successful (Burt & Burzynska, 2017; Burt & Oppen, 2017; Burt, 2019), have higher returns on assets (Burt & Oppen, 2017:534n; Burt, 2019),

and higher odds of business survival through the five years from interview into 2017 (Zhao & Burt, 2018).

Two Centralized, Closed Networks

Turning to a different example, Figure 2A displays a relatively closed business network embedded in family. The respondent CEO in Figure 2A named five key business contacts, who are largely interconnected by relations close (thin line) or especially close (bold lines). Contact one, the CEO's older brother, is the most central contact in the network in that he has the strongest connections with everyone.² Structurally, the older brother poses the highest contact-specific constraint on the respondent ($c_1 = 32.4$). Enacting structure, notice how dependent the CEO is on his brother, citing him as the person most valuable in founding the business, the person most valuable in resolving two significant events in the history of the business, and one of two people in whom the CEO has "highest trust." Contact two, the CEO's son, is the other central person in the network and the other person in whom the CEO has "highest trust." The CEO cites his son as the most valuable employee, a most valued current contact, and the person most

²We use contact-specific terms in the network constraint index to distinguish hierarchical networks and contacts at the top of the hierarchy (see Burt, Kilduff, and Tasselli, 2013:532; Burt, 2019:27, for illustration). The network around each CEO is a matrix of symmetric relations varying between zero and one ($0 \leq z_{ij} = z_{ji} \leq 1.0$, $z_{ij} = 0$). The size, or degree, of CEO i 's network is the number of contacts cited by the CEO (N). Network density is the average strength of relations between contacts ($\sum_j \sum_k z_{jk} / (N*[N-1])$). Network constraint is the sum across contacts j of the extent to which the CEO i is directly and indirectly connected with j : $C = \sum_j c_{ij}$, where $c_{ij} = (\rho_{ij} + \sum_k \rho_{ik}\rho_{kj})^2$, ρ_{kj} is the proportional strength of k 's connection to j within the CEO's network ($\rho_{kj} = z_{kj} / [\sum_j z_{kj}]$). The sum of squared elements increases with the extent to which constraint is concentrated in one of the CEO's contacts. That concentration can be measured by the Coleman-Theil hierarchy index (Burt, 1992:70-71): $\sum_j (c_{ij} / [C/N]) * \ln(c_{ij} / [C/N]) / (N \ln[N])$. We multiply density, hierarchy, and constraint scores by 100 for integer presentation and discussion. We identify the "most central" contact by the following decision rule: Most central is contact j with the highest contact-specific constraint c_{ij} (e.g., contact 2 in Figure 1, contact 1 in Figure 2A, contact 3 in Figure 2B). When there is more than one contact with maximum c_{ij} (typically a tie between two contacts), the most central is the contact with the stronger relation to the respondent (z_{ij}). When two contacts have the same maximum c_{ij} and z_{ij} , we use the founding contact as most central (which, in these data, is always a most-central contact when there is more than one most-central contact).

valued in resolving three significant events in the history of the business. Two other people are cited as most valued current contacts, both of whom are strongly connected with the CEO's older brother and somewhat connected to the CEO's son. The problem person (contact 5) in the network is a female competitor who has successfully taken customers away over the last five years.

The business in Figure 2A meets the definition of a family firm in that the CEO is the owner, and one of his sons is an employee. Beyond definition, the business is embedded in family in that the people most central in the CEO's network are family, and it is family who have been most valued in helping the CEO through significant events in the history of the business.

———— Figure 2 About Here ————

Family firms are not alone in having the centralized, closed network in Figure 2A. The same network structure can be found around businesses that have little to do with family. Figure 2B displays a centralized, closed network around one of the sample businesses that has nothing to do with the CEO's family. None of the cited contacts are family. The CEO founded his business 10 years ago and now employs 21 people. Strong relations cluster around the third contact, who is the most central in the network (contact-specific constraint, c_3 , is 41.5). The CEO met the third contact three years ago, during a financial pinch, through which the contact provided valued financial help. The CEO's longest relationship is with contact one, who he met in the year he founded his business, but now meets less often than his other cited contacts. The first contact is cited as most valued in founding the business, and during the first significant event (replacing a key supplier). The line connecting contacts 1 and 3 is thicker than the line connecting contact one with the CEO, which means the respondent feels that contact one is less close to the CEO than to the central finance person, contact 3. The same is true for contact 2, who is the CEO's most valued employee, who the CEO sees daily, and has known for seven years. The same is especially true for contact 5, who the CEO

cites as his most difficult contact this year: Contact 5 stole products when the business moved, but the CEO's response is restrained because contact 5 has a strong connection with central contact three. In sum, the CEO is something of a visitor in his own network. Contact 3, the person who helped with a financial issue, is the most central person in the network. In this light, it is interesting to note that the CEO's highest trust is in someone else.

Network Characteristics in Table 1

The 15 network characteristics in Table 1 make distinctions illustrated, for the most part, by the above three example networks. Characteristics 25 – 27 distinguish reasons for citing family as key business contacts: respectively, for help in founding the business, for help in a significant event in the history of the business, or as a current contact. Characteristics 28-29 distinguish the volume of family cited: respectively, none (as in Figures 1 and 2B), or multiple (as in Figure 2A). Characteristics 30 and 31 distinguish networks in which a relative is the most central contact (as in Figure 2A), versus the more typical network in which someone outside the family is most central (as in Figures 1 and 2B, and 80% of the sample networks). Characteristic 32 distinguishes networks in which the CEO relies on one contact for help on more than one significant event (as in Figure 2A, versus Figure 1). Characteristics 33 – 37 distinguish network structures: small (Figures 2A and 2B) versus large (Figure 1), broker networks (large, open networks rich in structural holes as in Figure 1), cliques (which correspond to groups in that contacts are all strongly connected with one another), and partner networks (networks in which contacts are connected indirectly through a central contact other than the CEO as in Figures 2A and 2B).³ Finally, we distinguish businesses for the extent to

³We assigned business networks to the three categories following Burt (1992:143) and with respect to the networks around Chinese CEOs, Burt (2019:33). Using the network metrics discussed earlier in footnote 2, separate the 700 networks into flat versus partner networks using the median value of network hierarchy. Then separate the flat networks into brokers versus cliques using the median value of network constraint.

which the person running the business is connected politically. Taken from Burt and Opper's (2020:Figure 2) analysis of political connection and disconnection among Chinese entrepreneurs, a CEO is connected (27% of the sample) if he or she is a Party official or long-term member, has been a cadre in government, cites key business contacts who are in the Party, and uses business funds to support Party activities. The CEO is politically disconnected (29% of the sample) if he or she has no indicators of political connection, and multiple indicators of receiving no government help with the business, and having no personal connections with local or municipal cadres.

DISTINGUISHING BUSINESSES WITH RESPECT TO FAMILY

To see how the characteristics in Table 1 cluster around family firms, and one another, we compute Jaccard coefficients measuring the co-occurrence of characteristics. The Jaccard between characteristics A and B is the ratio of the number of businesses in which A and B both occur divided by the number in which either occurs. If A and B always occur together in the same businesses, the Jaccard is one. If they never occur together, the Jaccard is zero.

Kinds of Businesses with Respect to Family

Figure 3 is a multidimensional scaling of the Jaccard coefficients. Characteristics are close together to the extent they occur in the same businesses. For example, to the extreme left in Figure 3, characteristics 28 (no family among key business contacts) and 31 (most central contact is beyond family) are adjacent, indicating that they often occur together whenever one or the other occurs. Networks containing no family always occur with non-family being most central (425 businesses), but another 132 networks include family when someone beyond the family is most central, so the Jaccard between 28 and 31 is .76 (425/557). The two axes in Figure 3 describe 75% of the variance in the Jaccard coefficients, so the picture is a good description of the data. The horizontal axis

is primary, capturing 59% of the variance. The vertical axis a substantial secondary dimension, capturing 16% of the variance. To emphasize the relative descriptive power of the two dimensions, axes in Figure 3 are proportional in length to the eigenvalues defining them. Loadings on the axes are given in parentheses for each characteristic in Table 1 (e.g., characteristic 30 loads .77 on the horizontal axis and .01 on the vertical).

———— Figure 3 About Here ————

The principal dimension in Figure 3 — along the horizontal — distinguishes nonfamily businesses to the left, versus family businesses to the right. To the left are CEOs who live in a large, open network rich in structural holes (characteristic 35), cite no family as key business contacts (28), and whose most central business contact is someone beyond his or her family (31). To the right is just the opposite, businesses that include multiple family members among key business contacts (characteristic 29), and the most central business contact is family (30). In fact, there is a gap in the data between business characteristics to the left in Figure 3 (hollow dots) and the cluster of 12 business characteristics associated with family businesses to the right (solid dots). Almost everything to the right of the space is about embedding the business in family. We refer to the solid-dot items as “family characteristics.” The three solid square dots in Figure 3 refer to the formal definition of family firms based on ownership and governance (characteristic 8): owner operators employing their spouse (20) or one or more of their children (21). Adjacent characteristics related to the definition are having a large family (7), being the sole owner of the business (10, 17), recruiting employees from family (24), citing a family member as most valued in launching the business (25), turning to family members during significant events after launch (26), along with the above-mentioned characteristics of citing family as key business contacts (27, 29), and seeing a family member as the most central of one’s key business contacts (30).

The multidimensional space distinguishes network composition from network structure. Composition varies on the horizontal axis, from networks containing no family

at the left across to networks containing family at the right. Structure varies along the correlated axis marked with a solid arrow in Figure 3, from small, closed networks at the lower middle of the space (characteristics 33 and 37, illustrated by the networks in Figure 2 and 3) up to large, open networks to the northwest of the space (characteristics 34 and 35, illustrated by the network in Figure 1). So we have network composition linked with family business on the horizontal axis in Figure 3, distinct from the network structure axis. Since network structure is the correlate of trust and business success, composition separate from structure in Figure 3 foreshadows our analysis in that we find no trust advantage nor performance advantage for family business.

On a related note, political connection is relatively independent of both family and network structure. The extremes of political connection (characteristic 38) and political disconnection (characteristic 39) are linked by a dashed-line arrow in the center of Figure 3. The axis parallels the network structure axis, but is in the center of the space indicating a weak correlation with the horizontal family-business axis. There is a slight tendency for family businesses to be less connected politically (characteristic 39 is on the family side of Figure 3), but it will turn out to be negligible (the family embedding index is correlated $-.02$ with political connection and $.12$ with disconnection). Here again is a foreshadow of our analysis. Political connections are a business dimension separate from the extent to which a business is embedded in family.

———— Figure 4 About Here ————

Family Embedding Index

To describe the extent to which a business is embedded in family, we sum family characteristics. A business could have one or more of the dozen family characteristics highlighted by an asterisk in Table 1 and indicated by solid dots in Figure 3. The sum, a “family index” score, defines the horizontal axis in Figure 4. The most common condition is no family characteristics; 213 of the sample businesses have none of the family

characteristics. At the other extreme, two sample businesses have an index score of 11, the maximum observed score.⁴

Three categories of businesses are distinguished in Figure 4: Family firms are the businesses that meet the family firm definition of owner head of business with CEO spouse or child employed by the firm (dark areas in Figure 4). The minimum number of family characteristics that qualifies a business to be a family firm according to the definition is two (characteristic 8 plus characteristic 20 or 21). The definition works well. It captures almost every business that has seven or more of the family characteristics. At the same time, there are numerous other businesses that have multiple family characteristics. Of the 700 sample businesses, 239 meet the definition of a family firm. Another 184 look like family firms — in the sense of having multiple relational characteristics associated with family firms — but do not meet the more formal definition of an owner-run company, who employs family members. *For reasons to be given shortly, we refer to these businesses as “hybrid” family firms* (downward-stripe areas in Figure 4). At the other extreme, there are 277 businesses in which family has little or no presence (white areas in Figure 4). Most of these “family-excluded” businesses have none of the dozen family characteristics (zero on the Figure 4 horizontal axis).

MAKING SENSE OF HYBRID FAMILY FIRMS

The distinction between family firms and hybrid family firms is correlated with the number of family characteristics a business has (7.62 t-test, $P < .001$). Figure 4 shows that almost all hybrid family firms have two to six family characteristics. In contrast, almost all businesses with more than six family characteristics are family firms. Is the

⁴Family characteristics are stretched across the right side of Figure 3. To capture the extent to which each characteristic indicates a family firm we computed a weighted family index: $(\sum_j d_j w_j) / (\sum_j w_j)$, where d_j is a dummy variable (one if a business has characteristic j , zero otherwise), and w_j is the loading of the characteristic on the horizontal axis in Figure 3 (loadings listed in Table 1). The weighted family index is correlated .97 with the simple count of family characteristics, so we stay with the more obvious metric of counting family characteristics.

difference between family firms and the hybrids anything more than the higher volume of family characteristics in family firms?

It is, as the following analysis of demographic, organizational, and network characteristics shows.

Demographic Characteristics

Demographic characteristics of the CEO are given in Table 2. Cells contain the average of the row variable for the column category of firms. For example, 82% of CEOs in family-excluded firms are men, versus 86% in family firms. Test statistics in parentheses indicate the extent to which the averages for hybrid and actual family firms are higher than the average for family-excluded firms. The 1.30 test statistic for gender of CEOs in family firms shows that the slightly higher proportion of family-firm CEOs who are men is negligible. Similar to the lack of gender difference between the three categories, there are no statistically significant differences in the tendencies for CEOs to be married or have working spouses. They are almost all married, and uniformly about two thirds have a spouse or partner who is employed. In short, with respect to gender, marriage, and a working spouse, CEOs in all three categories have similar families.

———— Table 2 About Here ————

Differences occur in family size, CEO age and education. For rows below “working spouse” in Table 2, the means for family-excluded and hybrid family firms are similar, both statistically distinct from family firms. With respect to family size, CEOs of family firms come from larger families (three or four siblings versus two or three) and themselves have larger families (two children versus one, and more likely to have three or more children). CEOs of family firms also tend to be older (late 40s in 2012 rather than mid 40s), and less educated (college degree is twice as likely for the CEOs of family-excluded and hybrid firms).

Not reported in Table 2 are the city and industry sampling strata from which firms were drawn for study. Industry is independent of the three columns in Table 2 for four of

the five sampling-strata industries: transportation equipment (auto and vehicle parts), textiles, machinery, and electronics (computer and communication equipment). The exception is pharmaceuticals, which for the sample businesses are largely limited to manufacturing established drugs (versus discovering and marketing new drugs). Sample pharmaceutical businesses are especially unlikely to be family firms (14% in pharma versus 37% in other industries, -3.68 loglinear test statistic, $P < .001$), likely to be hybrid family firms, and especially likely to be family-excluding firms (52% in pharma versus 38% in other industries). Here again, hybrid family firms stand with family-excluded firms as distinct from family firms.

———— Figure 5 About Here ————

The hybrids and family-excluded firms also contrast with family firms in terms of broader environment. Family firms appear away from provincial capitals, especially in cities where there is relatively little foreign capital invested. One hundred businesses were drawn for the sample from each of the seven cities in Figure 5 (Nee & Opper, 2012:52-64, offer thumbnail description of the city histories). Bars in the figure are proportional to loglinear test statistics measuring the tendency for family firms to be observed less frequently than would be expected if family firms were randomly distributed across cities. Hybrids and family-excluded firms are concentrated in the two capital cities to the left in Figure 5: Hangzhou, capital city of Zhejiang province, and Shanghai, an independent municipality with provincial status in its own right. The one other provincial capital in the sample, Nanjing, has more hybrids and family-excluded firms than would be expected by random chance, but not significantly so. In the remaining four sample cities, family-excluded firms and hybrids appear less often than expected by chance. The inset graph shows how the loglinear test statistics in the larger graph vary with levels of per capita of foreign capital invested in each city during the survey year (foreign capital invested and population data for 2012 are State Statistical Bureau data, accessed via www.china-data-online.com). Family-excluded and hybrid

family firms are disproportionately likely in cities with a greater presence of foreign direct investment.

Organization Characteristics

The first two rows in Table 3 show that CEOs in each category are similar in running businesses launched about a dozen years ago (in the 2000), and have similarly grown their businesses into enterprises with 120 to 150 employees.

———— Table 3 About Here ————

The businesses differ in how control is distributed. Ownership is concentrated in the CEO of hybrid family firms, similar to a family business, and in contrast to wider distribution in family-excluded businesses. Rows three through the bottom of Table 3 show hybrids and family firms similar to one another, and significantly different from family-excluded businesses. Hybrids and family firms are: (1) more likely to be run by a person who founded the business (likely for all of the businesses, but respectively 82% and 87% for hybrids and family firms, versus a lower 70% for family-excluded firms), (2) more likely to be businesses in which the CEO owns the highest share of the business (73% and 91% of the hybrids and family firms, versus 61% of family-excluded firms), (3) more likely to have a CEO who owns 100% of the business (which never occurs among the family-excluded firms, but occurs in 24% of family firms, and 35% of hybrid family firms),⁵ (4) and more likely to employ managers who own none of the business (47% and 32% of hybrid and family firms, versus 7% of family-excluding firms). The similarity of hybrid and actual family firms is striking in histograms of ownership. In hybrids and family firms, the most likely level of ownership is 100%. Table 3 shows respectively 35%

⁵The absence of sole-owner CEOs in family-excluded firms means we use a different model to calibrate column differences on the row variable. We fit a loglinear model as introduced by Goodman (1970) in which the average across columns is the reference point for effects (rather than the mean for family-excluded firms used in the other rows). Thus, the estimated statistical significance of the many sole-owner CEOs in family firms and hybrid family firms is conservative relative to models in the other rows. Given strong results, the conservative tests are quite sufficient.

and 24% of CEOs in these firms own 100%. The other 65% of CEOs in hybrids and 76% of CEOs in family firms are scattered from 0% to 99% with low frequencies at any one level of ownership. The distribution of ownership is reversed in family-excluded firms. The most frequent level of ownership is 0%, with less frequent levels of ownership scattered from 1% to 95%.

Looking beyond the firm, the bottom row of Table 3 shows that one in ten CEOs of family-excluded firms say they use family as a channel for recruiting new managers and technical staff. Recruiting through family is twice as likely in hybrids, and almost four times as likely in family firms.

Network Characteristics

The behavioral similarity of CEOs in hybrids and family firms is richly displayed in their business networks. The first seven rows of Table 4 show hybrids and family firms similar to one another and distinct from family-excluded firms: (1) Family are more often cited as key business contacts by the CEOs of hybrids and family firms, (2) especially with respect to help during significant business events in the history of the firm, (3) but also as current key contacts, and (4) family more often provides the most central contact in networks around the CEOs of hybrids and family firms.⁶ Particularly striking is the

⁶We can go one level deeper within the firm. Ertug, Kotha, and Hedstrom (forthcoming) report on the distribution of family ties within a firm. Using census data on small and medium Stockholm companies launched during a six-year period, they find that relatives of founders in a firm hurt company sales, but hiring employees who are family to one another has a positive effect on both company sales and survival. This made us curious about how often our Chinese entrepreneurs cited family members as their "most valuable employee." The answer is "never" for the family-excluded firms, of course, but the odds are strikingly similar for family and hybrid firms:

family "most valuable employee,"	23.0% family
hybrid "most valuable employee,"	24.5% family
family other contact,	10.6% family
hybrid other contact,	13.5% family

absence of family in the networks around CEOs of family-excluded firms. By random chance, one could expect citations to a family member here or there. Family citations were not excluded by the definition of family-excluded firms. The “none” entries in the first seven rows of Table 4 highlight the propriety of our “family-excluded” label for businesses with none or one of the family characteristics in Table 1. The conservative nature of the tests (footnote 5) can be seen in the test statistics being lower in the “none” rows, but all tests in Table 4 clearly reject the hypothesis that family is equally present in the networks of CEOs in the three column categories.

———— Table 4 About Here ————

The CEOs of hybrids and family firms also stand apart with respect to their trust in contacts within versus beyond the family. Average trust is reported in Table 4 for contacts who are family versus those who are not. We see three points in the results: Trust is higher in family than in contacts beyond the family (2.41 t-test, not in Table 4). Even CEOs of family-excluded firms trust their occasional family contacts over contacts beyond the family (4.42 mean for family, versus 3.98 for contacts beyond the family). Second, CEOs of hybrids and family firms are similarly less trustful of contacts beyond the family (-3.32 and -7.98 t-tests respectively), and third, they are similarly more trusting of business contacts within the family (2.23 and 2.41 t-tests respectively).⁷

Both tendencies for family more likely to be cited as most-valuable employee are statistically significant (14.66 and 28.12 chi-square statistics, 1 d.f., $P < .001$) and negligibly different from one another (-0.71 loglinear test statistic, $P \sim .48$). Similar citation of family as most-valuable employee is another indicator of behavioral similarity between the heads of family and hybrid firms.

⁷The two rows testing trust differences in Table 4 are slightly different from the models in the other rows. There is an observation for each cited contact. The 700 respondents cited 4,464 key business contacts. We use a regression equation identical to the one given at the beginning of the next section, but here Y is trust in a contact and N is a dummy variable equal to 1 if the contact is a member of the respondent’s family. Then coefficient b_n is the higher average level of trust in family contacts (2.41 t-test in the text), coefficients b_h and b_f are respectively adjustments for the lower trust from CEOs of hybrids and family firms in contacts beyond the family, and coefficients b_{hn} and b_{fn} are respectively adjustments for the higher trust from CEOs of hybrids and family firms in contacts within the family. Test statistics for b_h , b_f , b_{hn} , and b_{fn} are given in

Beyond the prominence of family in the networks around CEOs of hybrids and family firms, structure too is correlated with the family business index (solid line arrow in Figure 3). Structure does not have the strong correlations of an indicator characteristic, but it is certainly correlated. The Table 4 pattern of associations with network structure are quickly obvious in Figure 6. The CEOs of family-excluded firms are most often network brokers — large, open networks rich in structural holes. Figure 1 is an illustrative broker network around the CEO of a family-excluded firm. The least common network is a clique — the usual image of a group, which is a closed network in that everyone is directly connected. The CEOs of hybrids and family firms are similar in being the most likely to have partner networks and least likely to have broker networks (indicated by bar height in Figure 6 and statistical tests for broker and partner networks in Table 4). Partner networks are closed by strong indirect connections among contacts through a central contact other than the CEO. Figure 2A is an illustrative partner network around the CEO of a family firm.

———— Figure 6 About Here ————

Results in the bottom two rows of Table 4 concern the extent to which a CEO has personal connections with political leaders. The probability of being politically connected is about one in four within each of the three business categories. Political disconnection is where a difference appears. CEOs of hybrid family firms are more likely to be politically detached. We are reminded of an entrepreneur quoted in Nee and Opper (2012:236) who found virtue in being focused on business, indifferent to political connections: “Politics is just another game. Since I chose to play the game of business, I do not want to play another game. Among my circle of friends, those who do business, they are not very interested in that. There is a feeling that companies that want to have a close relationship with the government must have something to hide.” Given the mix of

Table 4, corrected for autocorrelation between contacts cited by the same respondent (“cluster” option in Stata).

business disadvantages that Burt and Opper (2020) report for politically disconnected Chinese entrepreneurs, the concentration of disconnection among CEOs of hybrid family firms raises a red flag about their performance.

SO WHAT?

How much do the above distinctions matter for the performance of private enterprise in China? We use regression models of the following form:

$$Y = a + b_n N + b_h H + b_f F + b_{hn} HN + b_{fn} FN + \sum_k b_k X_k + e,$$

$$= (a + b_h H + b_f F) + (b + b_{hn} N + b_{fn} F)N + \sum_k b_k X_k + e,$$

Where Y is a performance variable, N is a network measure, H is a dummy variable distinguishing hybrid family firms, F is a dummy variable distinguishing family firms, X_k is the k th control variable, and e is a residual. For hybrids and family firms respectively, coefficients b_h and b_f are adjustments to the level of Y for family-excluded firms. Positive b_h , for example, would indicate that hybrids are higher on Y than are family-excluded firms, holding constant the rest of the model. For hybrids and family firms respectively, coefficients b_{hn} and b_{fn} are slope adjustments to the association between Y and N for family-excluded firms. For example, positive b_{hn} would indicate that the association between Y and N is more positive for hybrids than it is for family-excluded firms, holding constant the rest of the model.

Performance Variables

We use three different performance measures, which have been used in prior work using the same dataset as we do: government help, business success, and business survival.

We follow Burt and Opper (2020) in measuring government help in terms of kinds of help. A series of survey question asked respondents whether the government had helped their business over the last three years preceding the survey. The help could be either formal or informal, and it could be provided by any national, regional or local

government bureau or government official. Help to identify prospective domestic customers was most common (136 out of 700), followed by help to obtain discounts for renting buildings or machinery (120). Other forms of government assistance included tax benefits (91), help with access to land use rights (70) and bank loans (59), help to identify foreign customers (48) and suppliers (17) and to license foreign technology (14) or connect with foreign investors (5). Finally, one respondent reported help in an 'other' field. Only a minority of respondents received help in any of these areas (291 or 41.6%).

Most of the entrepreneurs, received assistance only on one kind of issue (20.0%). Another 12.4% of the respondents received help on two kinds of issues, and 9.1% received help on more than two kinds of issues (9.1%). Burt and Opper (2020) construct government help as a four-category ordinal variable recording help on none, one, two, or more kinds of issues. Given the majority of respondents in the "none" category, we also use a binary variable distinguishing businesses that received none versus any government assistance.

Our second performance measure is Burt and Burzynska's (2017) composite measure of business success. Three factors are considered: (1) total sales, (2) total employment, and (3) the number of patents a company holds as a signal of technological sophistication. As one can expect, the three variables are strongly correlated, so we use their first principal component, which captures 65% of variance in the three indicators (Burt & Burzynska, 2017:229, confirm that the network association with each of the three success indicators is individually significant). For our analysis, we calculate the z-score principal component as our measure of business success. Finally, we include return on assets (net income over assets) as a measure of efficiency of business operations.

The sample businesses are entrepreneurial ventures, so survival is generally a struggle, especially for younger firms still trying to establish their market niche. China's mixed institutional setting with continuing state support for state-owned and state-

controlled corporations adds to the many challenges facing CEOs of private companies (Lardy, 2018). Survival was especially difficult in the aftermath of the global financial crisis, when the national government launched a large-scale financial stimulus program that prioritized state actors (Bai, Hsieh, & Zheng, 2016), while private firms were struggling with excess manufacturing capacity and increasing private enterprise debt (e.g., Obstfeld, 2016). In parallel, the launch of Xi Jinping's anti-corruption campaign in 2012 limited managers' chances to trade gifts and favors against 'informal' government support and favorable treatment (succinct overview is provided by the Wikipedia entry, "Anti-corruption campaign under Xi Jinping;" Marion, 2016, puts the campaign in historical context to argue that it was an unusual event). With increased detection rates and critical sanctions including office removal and legal prosecution, it is reasonable to assume that the 'utility' of government ties in the manager's business network declined (Lin et al., 2018). It is, however, worth noting that this effect is likely stronger for larger firms than for small, liquidity-constrained companies.⁸

Business survival is not reliably reflected by current company registers. The reason is that owners may decide to let their ailing firm go temporarily 'dormant' rather than deregistering their company. To measure firm survival five years after the survey (2017) we follow Zhao & Burt (2017), whose measure offers a more differentiated account. Three states are distinguished: (a) companies that have formally de-registered so they can be considered "dead," (b) companies that are still registered but appear 'dormant' from their lack of activity, and (c) registered companies that continue active. Two conditions distinguish between active and dormant companies. To qualify as 'active': 1)

⁸Nee & Opper (2012: 244) cite one of their respondents, interviewed just one year before the launch of the anti-corruption campaign: "There is now a lot of corruption in government; officials require kick-backs, which a small firm like ours cannot pay. For instance, treating officials to dinner in Beijing costs easily more than ¥20,000; this is hard to pay for small-scale companies. But securing these government contracts is important. With these deals, big firms can still make a profit margin of more than 100 percent. Their costs might be just ¥600 per piece, but they can sell for 1,500 to 2,000 to government. Without such deals, my own profit margin is down to 12 to 14 percent."

The company has to have an active internet presence (according to search via China's web browser Baidu), that shows regular webpage updates or vacancy announcements in 2017, and 2) the company has an entry in Qixin.com (a Chinese online register of firm data). Dormant companies, in contrast, do not satisfy these conditions while remaining formally registered (Zhao & Burt, 2018, provide further detail). In total, there are 265 (37.9%) firms from the 2012 survey which had de-registered by 2017, 201 (28.7%) 'dormant' companies, and 234 (33.4%) active companies.

Baseline Results

Baseline models from earlier work are given in Table 5. Model 1, based on Burt and Oppen's (2020) analysis of political connections, shows government help is associated with CEO's who have extensive personal connections with political leaders and run a business containing a research and development (R&D) department. For this analysis, political connection is a three-level variable distinguishing: (1) businesses run by a CEO who is personally connected in politics, (0) businesses run by a CEO who is neither especially connected nor especially disconnected from politics, versus (-1) businesses run by a CEO who is personally disconnected from politics. As reported by Burt and Oppen (2020), having a large, open business networks — typically associated with business success — is independent of receiving government help (0.81 t-test).

———— Table 5 About Here ————

Model 2 follows Burt and Oppen (2017) in predicting business success, but adds political connection, government help, and percentage entertainment costs as potential success factors. As reported in Burt and Oppen, more successful businesses are the ones run by a CEO with a business network rich in structural holes (-3.35 t-test), who is not a founder (-4.27 t-test), operating a business that has survived longer (6.51 t-test), has a research and development department (9.70 t-test), and was relatively successful in the business' first year after being registered as a private enterprise (6.45 t-test). In addition, business success is greater with a politically connected CEO (4.82 t-test) who

is able to get government help for the business (3.65 t-test). CEOs running less successful businesses spend a high percent of income on entertainment and travel costs (-6.19 t-test). Not surprisingly, the network association with business success is also apparent in business profits at the time of the survey. If we use Model 2 to predict return on assets at the time of the survey, more profitable businesses are run by a CEO with a large, open network (-2.55 t-test with network constraint).

Model 3 follows Zhao and Burt (2018) in predicting businesses survival across the turbulent five years after the 2012 survey. As reported by Zhao and Burt, the businesses still active in 2017 are run by a CEO in 2012 who was not a founder (-2.72 test statistic) operating within a business network rich in structural holes (-3.10 z-score test statistic for network constraint), and operating a business that was successful in 2012 (2.04 test statistic) and already successful in the business' first year after being registered as a private enterprise (2.32 test statistic). Survival is further associated with receiving government help before 2012, and having a research and development department (respectively test statistics of 2.53 and 2.73).

Results with Family-Firm Distinctions

Table 6 presents estimates for the three models in Table 5, now with the four additional family-firm variables specified in the above equation: dummy variables distinguishing hybrid and family firms from family-excluded firms, and two interaction effects for hybrids and family firms with network constraint.

The first three rows of Table 6 show that hybrids and family firms do not differ from family-excluded firms in their average levels of performance. Holding constant the baseline variables in Table 5, hybrids and family firms do not differ in their level of government help (Model 1, coefficients b_h and b_f , with respective negligible z-score test statistics of 0.80 and 0.92, and a negligible summary test for both coefficients equal to zero; 1.05 chi-square statistic with 2 d.f., $P \sim .59$). Similarly, hybrids and family firms do not differ from family-excluded firms in their levels of business success (Model 2), or

their probability of surviving for the next five years (Model 3). We get the same results if we use Model 2 to predict return on assets ($0.01 F_{(2,677)}$, $P \sim .99$).

The next three rows of Table 6 show almost the same results for adjustments to the network association with performance. Hybrids and family firms by and large have the same network advantage as family-excluding firms. Holding constant the variables in Table 5, a large, open network improves survival odds of hybrids and family firms as much as it improves the survival odds of a family-excluded firm (Model 3, coefficients b_{hn} and b_{fn} , with respective negligible z-score test statistics of 0.86 and 1.36, and a negligible test for the hypothesis that both coefficients equal zero: 5.35 chi-square statistic with 4 d.f., $P \sim .25$). Similarly, hybrids and family firms resemble family-excluded firms in the network association with higher business success ($2.74 F_{(2,677)}$, $P \sim .07$), and (not surprisingly) do not differ with respect to the negligible network association with receiving government help (1.81 chi-square statistic, 2 d.f., $P \sim .67$). Again, we get the same results if we use Model 2 to predict return on assets at the time of the survey ($0.26 F_{(2,677)}$, $P \sim .77$).

The bottom row of Table 6 presents summary test statistics for the null hypothesis that all four level and slope adjustments are negligible. The null hypothesis cannot be rejected. The summary conclusion is that hybrids and family firms are no different from family-excluded firms in their levels of performance, or their network associations with performance. The CEOs of family firms and hybrid family firms more often turn to family as key business contacts, which affects the composition of networks. But in this probability sample, the performance associations with network structure predicted by network theory are by and large the same for all three categories of business.⁹

⁹The conclusion is corroborated by network predictions for trust. We do not elaborate this point in the text because elaboration would be too great an aside to the focus on performance, but we checked trust predictions and the similarity to Table 6 is useful corroboration. The primary network prediction about trust is that it is facilitated between people embedded in a closed network (Granovetter, 1985; research review in Burt, 2005:Chps. 3-4; and for China in

The summary conclusion is statistically accurate, but there is one point to note that could be productive. Hybrid family firms show a statistically significant slope adjustment to the network association with business success (2.23 t-test in Model 2), an adjustment that is marginally significant statistically ($P \sim .03$), but provocative. The magnitude of the adjustment coefficient (b_{hn}) is .65, which is larger in magnitude than the -.36 network association with business success in Table 5, and larger than the -.58 network association in Model 2, Table 6 (not reported). The summary network association with business success for hybrid family firms is therefore non-negative ($b_n + b_{hn}$ is .65 - .58, or .07). The non-negative success association with network constraint means — in contrast to family firms and family-excluding firms— that the success of hybrid family firms is not inhibited by having a CEO with a closed network!

———— Table 6 and Figure 7 About Here ————

Figure 7 shows the data behind Model 2 in Table 6. Across the horizontal axis, network constraint distinguishes CEOs in large open networks to the left (low constraint) from CEOs in small, closed networks to the right (high constraint, both extremes illustrated by sociograms below the left and right ends of the axis). The vertical axis in Figure 7 is z-score business success in Model 2 adjusted for the non-network baseline predictors in Table 5 (studentized residual from Model 2 in Table 5, excluding network constraint as a predictor). The data plotted in Figure 7 are scores on the horizontal and vertical axes averaged within quintiles of network constraint (bottom 20%, next 20%, and so on). The two solid lines in Figure 7 show the network association with business success for family firms (thin solid line) and family-excluded firms (bold solid line). The

Burt, Bian, and Oppen, 2018). Consistent with network theory, trust in a contact increases in the sample data with the extent to which CEO and cited contact have multiple mutual close friends (13.29 t-test). Consistent with the results in Table 6, there are no statistically significant differences in the rates at which trust increases for the three categories of businesses (0.28 $F_{(2,699)}$, $P \sim .76$). Further, with specific reference to networks and trust in China (review in Burt et al., 2018), there are no differences between the three categories of businesses in the tendency for event contacts to have *guanxi*-like properties of high trust (0.32 $F_{(2,699)}$, $P \sim .73$) that is independent of reinforcement from the surrounding social structure (1.11 $F_{(2,699)}$, $P \sim .33$).

lines are similarly negative in showing that successful businesses are run by CEOs with large, open networks. The more closed the network around the CEO, the less successful his or her business. The similarity of the two solid lines in Figure 7 explains the negligible slope adjustment for family firms in Model 2, Table 6 (0.47 t-test). All three lines are proximate around the average level of network constraint (56 points), which explains the negligible level adjustments for both family firms (-0.33 t-test) and hybrid family firms (0.31 t-test).

The dashed line in Figure 7 is the network association with success for hybrid family firms. The statistically significant slope adjustment in Table 6 is obvious: In contrast to the negative success association with network constraint for family and family-excluded firms, the association is positive for hybrid family firms. It is not so much positive across levels of network constraint as it is positive at the highest level of network constraint. Across the first four quintiles of network constraint, business success has no association with network constraint (the four square dots in Figure 7 have a slight negative association with network constraint, $r = -.05$ across the 162 hybrid family firms in the first four quintiles). Then, in the fifth quantile, the highest level of network constraint, business success jumps to its highest average level in Figure 7. In other words, hybrid family firms do well with a closed business network around the CEO. The reason for the aggregate test statistics being negligible in Table 6, despite the obvious slope adjustment in Figure 7, is that individual hybrid firms vary substantially around the means in Figure 7. We also hasten to add that we do not get the statistically significant hybrid slope adjustment if we predict return on assets (0.71 t-test) or if we interact network constraint with the family embedding index (-0.68 t-test).

DISCUSSION AND CONCLUSION

Our purpose here has been twofold: (1) use social network analysis to describe what it means for a firm to be embedded in a family, (2) reveal from the application a new kind

of firm, not family, yet akin to family. Armed with data on a large probability sample of private enterprises in China — a third of which meet ownership and employment criteria of being family businesses — we uncovered a category of firms we term “hybrid family firms.” Recognition of hybrid family firms adds to the literature’s illustrations of social network analysis used to distinguish types of businesses and business people, and extends the population of organizations within which governance and strategy are likely to be better understood when viewed through a family logic.

More specifically, the results in Table 6 show that there is no difference in average performance level or network advantage for the three categories of businesses: family firms, hybrid family firms, and family-excluded firms. The fact that CEOs of family firms and hybrid family firms more often turn to family as key business contacts is a fact about network composition that raises no questions about network mechanisms. Whether the CEO turns to more or fewer family contacts, government help is more likely with stronger political connections (Model 1) and business success and survival are more likely with a large, open network rich in structural holes indicating CEO connections into diverse groups beyond the business (Models 2 and 3). That said, the significant slope adjustment for hybrid family firms in Table 6, and the obvious slope difference in Figure 7, suggest that the unexpected success of the hybrid family firms with closed networks is a topic for closer observation. The point is particularly interesting since network advantage works the same for family firms as it does for family-excluding firms. In short, hybrid family firms look modern in the style of the family-excluded firms (Table 2 and Figure 6), but operate socially in ways more similar to family firms (Tables 3 and 4, and Figure 7). Something about the mix of look-modern and act-traditional has hybrid family firms prospering with a CEO embedded in a closed business network.

With respect to the literature on family embeddedness, we offer a research strategy that combines two perspectives: One that distinguishes family firms from other firms based on formal ownership and governance; and one, that focuses on family

involvement in business and advice networks. Our results suggest that a more comprehensive approach that takes into account both perspectives is likely to promise new insights, not only for research on family business in China, but elsewhere.

Our results also contribute to an ongoing debate as to whether East Asian firms capitalize on network advantage. Much of the popular narrative draws on anecdotes and case evidence highlighting the cultural distinctiveness of East Asian capitalism in general and the Chinese business model more specifically (see for instance, Chai and Rhee, 2010; Redding, 1990). Here we extend and confirm earlier work testing the general applicability of the network structure-performance association across different cultural contexts (see for review Burt, 2019; Burt and Batjargal 2019). It is safe to say that a focus on Chinese family firms, often cited for their underlying Confucian ethics (trust and mutual support within closed kinship networks), presents the most critical test. Yet, even the heads of family firms — notoriously associated with closed and family-oriented leadership styles — benefit from open networks in the same way as leaders of nonfamily firms do.

The above questions open a portal to discussing *guanxi* in Chinese business, but we pause before we bounce through that portal. The intriguing success-closure effect for hybrid family firms is at the margin of statistical significance for research focused on strong results (2.23 test statistic in Table 6, $P < .026$), and runs counter to a large body of research showing that success tends to be lower and less likely for senior managers in closed networks. Our interest now turns to replicating the success-closure effect that our data reveal here for hybrid family firms to insure that the unusual effect is in fact a fact.

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Table 1. Family, Organization, and Network Characteristics

(Percent sample with characteristic, MDS score on horizontal and vertical axes in Figure 4. Asterisks “*” mark family characteristic.)

Family

1	One or two siblings (34%, -0.28, -0.03)
2	Three or more siblings (58%, -0.16, -0.21)
3	Married (97%, -0.32, -0.22)
4	Spouse/Partner works (69%, -0.27, -0.21)
5	One child (54%, -0.28, -0.15)
6	Two children (37%, -0.19, -0.02)
7*	Three or more children (7%, 0.40, 0.46)

Business Organization

8*	Firm meets owner & family employee criterion for family firm (34%, 0.32, -0.30)
9	CEO respondent founded the business (80%, -0.21, -0.32)
10*	Owns 100% of the business (18%, 0.43, 0.10)
11	Largest shareholder of the business (74%, -0.18, -0.37)
12	Owns 50% - 99% of the business (40%, -0.36, -0.09)
13	Owns something but less than 50% of business (30%, -0.19, 0.29)
14	Owns none of the business (12%, -0.15, 0.77)
15	Other managers own 50% - 100% (33%, -0.31, 0.41)
16	Other managers own something but less than 50% (42%, -0.23, -0.21)
17*	Other managers own none of the business (26%, 0.33, -0.06)
18	Outsiders own none of the business (78%, -0.25, -0.31)
19	Outsiders own some of the business (22%, -0.13, 0.63)
20*	Spouse/Partner is an employee in the business (22%, 0.37, -0.16)
21*	CEO respondent's child is an employee in the business (17%, 0.35, 0.17)
22	Key supplier introduced by family or friends (43%, -0.22, -0.15)
23	Key customer introduced by family or friends (23%, -0.16, 0.15)
24*	Employees recruited to business through family (23%, 0.23, -0.05)

Business Network

25*	Family cited as key contact in founding the business (31%, 0.61, -0.11)
26*	Family cited as key contact in significant event after founding (38%, 0.54, -0.16)
27*	Family cited as key current contact (22%, 0.71, 0.03)
28	No family among key business contacts (61%, -0.68, 0.00)
29*	Multiple family members among key business contacts (12%, 0.79, 0.23)
30*	Most central business contact is family (20%, 0.77, 0.01)
31	Most central business contact is beyond CEO's family (80%, -.56, -.09)
32	One contact is cited as key on more than two events (40%, -.07, -.19)
33	Smallest 33% of business networks; 5 or fewer (34%, 0.09, -0.17)
34	Largest 33% of business networks; 8 or more (24%, -0.25, 0.23)
35	CEO has broker network (35%, -0.48, 0.21)
36	CEO has clique network (16%, 0.00, 0.31)
37	CEO has partner network (49%, 0.08, -0.33)
38	Politically connected; in party and cadre friends (27%, -0.17, 0.25)
39	Politically disconnected; outside party and no cadre friends (29%, 0.08, -0.17)

Table 2.

Demographic Distinctions

Characteristics	Family-Excluded Firms (n = 277)	Hybrid Family Firms (n = 184)	Family Firms (n = 239)
CEO is male	0.82	0.83 (0.18)	0.86 (1.30)
CEO is married	0.96	0.96 (-0.22)	0.98 (1.50)
Working spouse/partner	0.68	0.70 (0.38)	0.62 (-1.31)
Number of CEO siblings	2.57	2.77 (1.42)	3.41 *** (6.44)
Number of CEO children	1.39	1.41 (0.36)	1.75 *** (6.14)
Has three or more children [7]	0.02	0.05 (1.75)	0.15 *** (4.49)
CEO age (years)	44.50	44.61 (0.14)	47.87 *** (4.62)
CEO education (years)	13.54	13.23 (-1.14)	12.24 *** (-5.07)
CEO is college graduate	0.26	0.22 (-1.13)	0.10 *** (-4.45)

Note — Characteristic distinguishing family firms has Table 1 number in [brackets]). Cells contain mean value of row variable for column category of firms. Parentheses contain robust test statistics for differences between column categories using family-excluded firms as reference category. Test statistics are from Poisson regression if row variable is a count, logit if row variable is binary. * P ≤ .05 ** P ≤ .01 *** P ≤ .001

Table 3. Organization Distinctions

Characteristics	Family-Excluded Firms (n = 277)	Hybrid Family Firms (n = 184)	Family Firms (n = 239)
Age of the business (years)	12.18	11.43 (-1.73)	11.83 (-0.84)
Number of employees (tests are with log N)	133.46	148.64 (0.38)	121.64 (-0.93)
CEO was a founder	0.70	0.82 ** (2.55)	0.87 *** (4.43)
Percent of the business owned by CEO	40.11%	61.19% *** (6.58)	68.19% *** (11.91)
CEO is largest shareholder of the business	0.61	0.73 ** (2.60)	0.91 *** (7.28)
CEO owns 100% of the business [10]	none	0.35 *** (4.31)	0.24 *** (3.20)
Other managers own none of the business [17]	0.07	0.47 *** (8.85)	0.32 *** (6.70)
Organization recruits employees through family [24]	0.10	0.22 *** (3.63)	0.38 *** (7.25)

Note — Characteristics distinguishing family firms have Table 1 number in [brackets]). Cells contain mean value of row characteristic for column category of firms. Parentheses contain robust test statistics for differences between column categories using family-excluded firms as reference category (except loglinear model in row with “none” for family-excluded firms, see text). Test statistics are from OLS regression if row variable is continuous, Poisson if row is a count, or logit/loglinear if row is binary. * P ≤ .05 ** P ≤ .01 *** P ≤ .001

Table 4. Network Distinctions

Characteristics	Family-Excluded Firms (n = 277)	Hybrid Family Firms (n = 184)	Family Firms (n = 239)
Percent of cited business contacts who are family	0.38%	15.86% ^{***} (15.55)	14.16% ^{***} (12.26)
One family member cited as key business contact	0.03	0.64 ^{***} (10.20)	0.29 ^{***} (6.73)
Multiple family cited as key business contacts [29]	none	0.15 ^{***} (2.73)	0.23 ^{***} (3.87)
Family cited as key contact in founding [25]	none	0.63 ^{***} (5.24)	0.44 ^{***} (3.67)
Family cited as key contact in significant event [26]	0.02	0.76 ^{***} (11.09)	0.51 ^{***} (8.90)
Family cited as key current contact [27]	0.00	0.39 ^{***} (5.08)	0.34 ^{***} (4.91)
Most central business contact is family [30]	none	0.36 ^{***} (4.12)	0.32 ^{***} (3.69)
Average trust, 1 to 5, in key contacts beyond family	3.98	3.85 ^{***} (-3.32)	3.68 ^{***} (-7.98)
Average trust, 1 to 5, in key contacts within family	4.42	4.74 [*] (2.23)	4.64 ^{**} (2.41)
Broker network	0.46	0.27 ^{***} (-4.18)	0.28 ^{***} (-4.21)
Clique network	0.19	0.18 (-0.18)	0.11 ^{**} (-2.43)
Partner network	0.35	0.55 ^{***} (4.26)	0.61 ^{***} (5.83)
CEO is politically connected	0.27	0.23 (-0.97)	0.29 (0.58)
CEO is politically disconnected	0.24	0.38 ^{***} (3.32)	0.28 (1.22)

Note — Same as previous table, except for the two rows predicting trust in a contact (see footnote 7).

Table 5. Baseline Predictions

	Government Help (Model 1)	Business Success (Model 2)	Business Survival (Model 3)
Log Network Constraint (20 – 100)	0.28 (0.81)	-0.36 (-3.35)	-1.73 (-3.10)
Less Successful in 2011 (0, 1)	—	—	-0.08 (-0.37)
Less Successful x Log Network Constraint	—	—	1.62 (2.04)
Political Connection (-1, 0, 1)	0.47 (4.53)	0.19 (4.82)	-0.08 (-0.54)
Government Help (0, 1, 2, 3+)	—	.10 (3.65)	0.27 (2.53)
Founder (0, 1)	-0.16 (-0.74)	-0.34 (-4.27)	-0.76 (-2.72)
Firm Age (years since founding, 1 - 30)	-0.02 (-0.94)	0.04 (6.51)	.004 (0.18)
Business Has R&D Department (0, 1)	0.57 (3.58)	0.57 (9.70)	.59 (2.73)
Entertainment & Travel Costs (0% – 14%)	0.10 (1.87)	-0.13 (-6.19)	-0.09 (-1.31)
Level of Success at Founding (z-score)	0.01 (0.18)	0.39 (6.45)	0.27 (2.32)
R ² (pseudo for logits)	.05	.53	.08

Note — Model 1 is an ordinal logit regression predicting the number (0, 1, 2, 3+) of kinds of issues on which a business received special assistance from a government agency or official (intercepts are 1.43, 2.47, and 3.53 for the three levels of assistance). Model 2 is an OLS regression predicting business success, which is a z-score principal component of business employees, sales, and patents (1.21 intercept). Model 3 is from a multinomial logit regression predicting whether the business observed in 2012 is alive, dormant, or dead in 2017 (7.17 intercept). The equation predicting “alive” is presented. Less successful in 2011 is a dummy variable equal to 1 if the business had ROA below the median for its industry in 2011. Log network constraint in the interaction term is a deviation score from its mean so the coefficient for being less successful in 2011 is estimated for the average network, and the coefficient for network constraint is estimated for businesses more successful in 2011. All predictions are with fixed effects for the five sample industries and seven sample cities. Robust test statistics are given in parentheses (Stata “robust” option).

Table 6.
Adjustments for Family Firms Are Negligible,
with the Exception of Network Advantage for Hybrids

Characteristics	Government Help (Model 1)	Business Success (Model 2)	Business Survival (Model 3)
Family Firm (0, 1)	0.15 (0.80)	-0.03 (-0.33)	-0.37 (-1.47)
Hybrid Family Firm (0, 1)	0.19 (0.92)	0.02 (0.31)	-0.28 (-1.07)
Test for no differences in average level of outcome	1.05 Chi-Square, 2 d.f. P ~ .59	1.19 F _(2,677) P ~ .82	2.53 Chi-Square, 4 d.f. P ~ .64
Family Firm x Log Network Constraint	0.20 (0.25)	0.12 (0.47)	0.83 (0.86)
Hybrid x Log Network Constraint	-0.66 (-0.71)	0.65 (2.23)	1.48 (1.36)
Test for no differences in outcome association with network constraint	1.81 Chi-Square, 2 d.f. P ~ .67	2.74 F _(2,677) P ~ .07	5.35 Chi-Square, 4 d.f. P ~ .25
Summary test for all four coefficients equal zero	1.801 Chi-Square, 4 d.f. P ~ .77	1.40 F _(4,677) P ~ .23	7.65 Chi-Square, 8 d.f. P ~ .47

Note — These are results from adding the four family-firm variables to the models in Table 5 using family-excluded as the reference category. Log network constraint in the two interaction terms is measured as a deviation from its mean so the coefficients for hybrid and family firms are estimated for the average network. As in Table 5, predictions are with fixed effects for the five sample industries and seven sample cities. Robust test statistics are given in parentheses (Stata “robust” option).

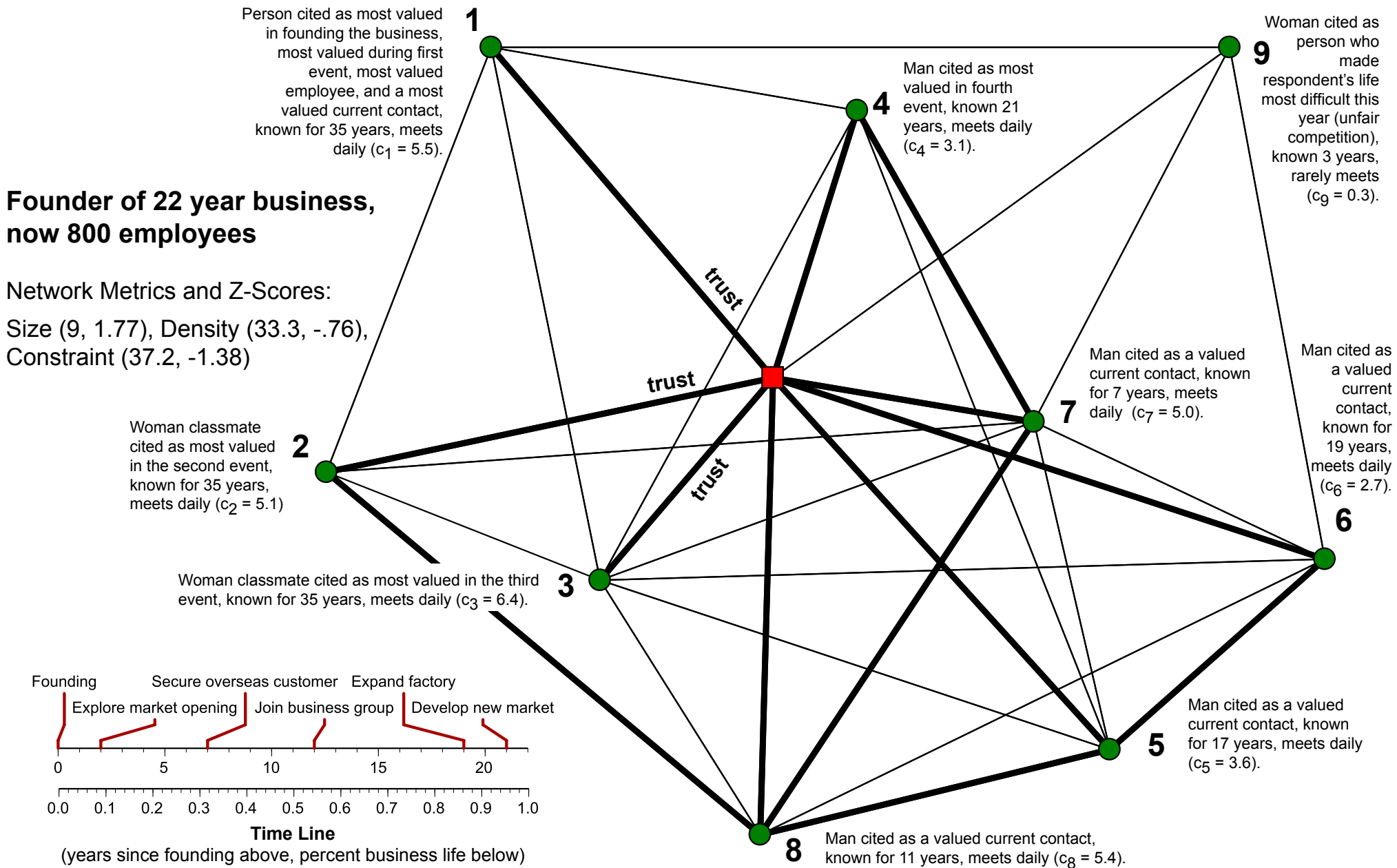
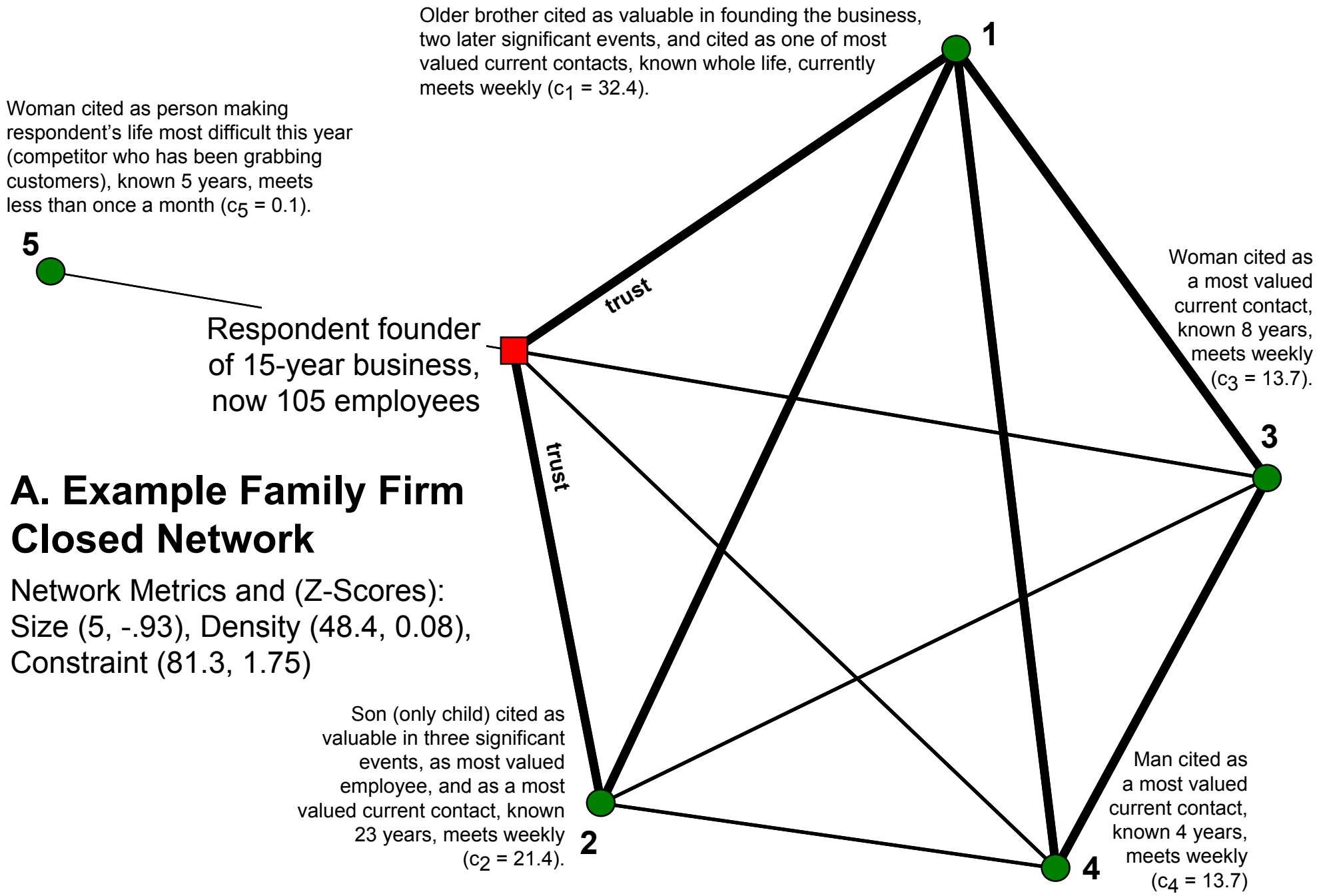


Figure 1. A Relatively Large, Open Network

(Line thickness indicates closeness. High-trust relation indicated by "trust." No line is "distant" relation. Respondent is the square.)

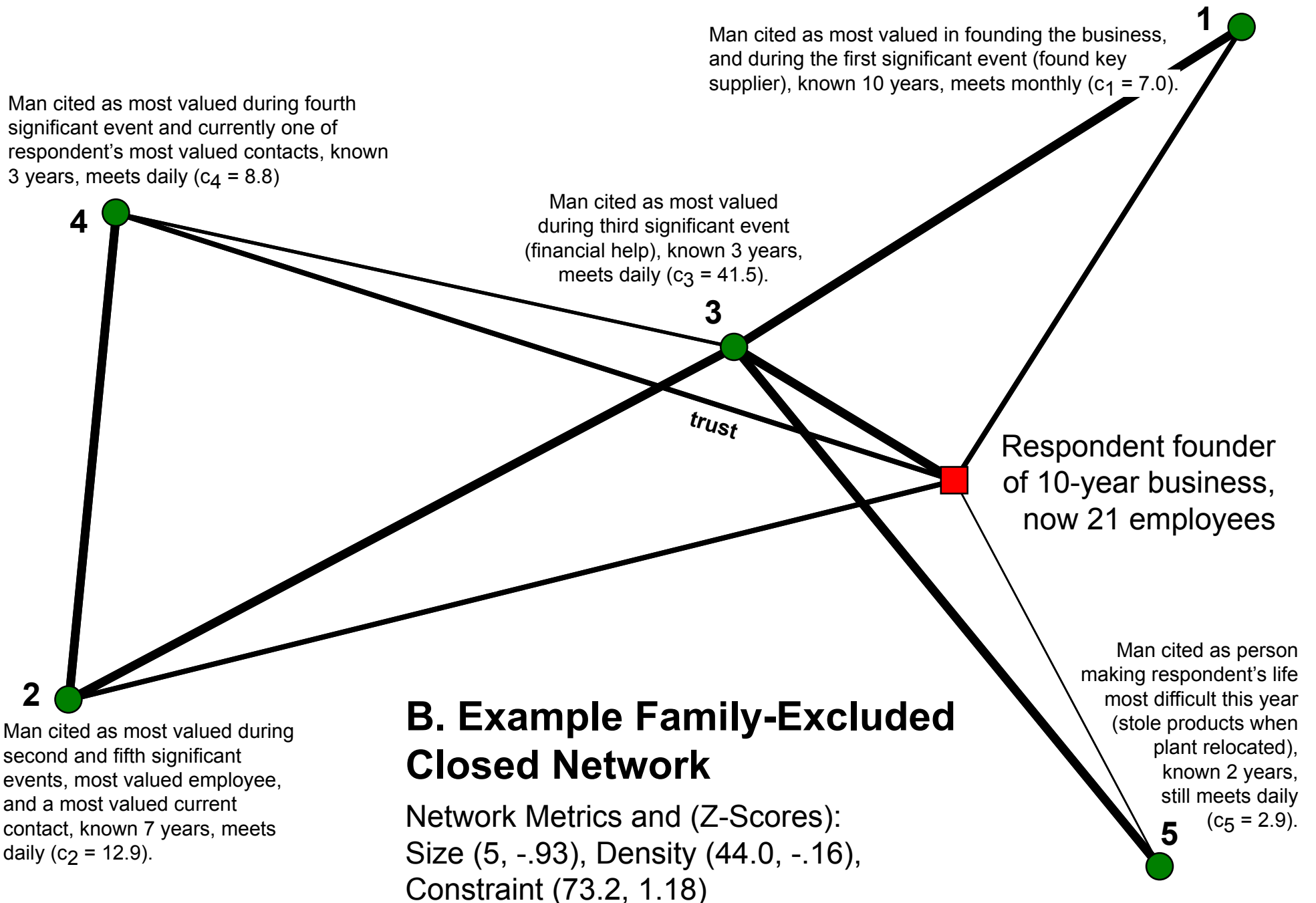
Figure 2. Two Example Closed Networks

(Line thickness indicates closeness. No line is "distant" relationship. Square is respondent.)



A. Example Family Firm Closed Network

Network Metrics and (Z-Scores):
 Size (5, -.93), Density (48.4, 0.08),
 Constraint (81.3, 1.75)



B. Example Family-Excluded Closed Network

Network Metrics and (Z-Scores):
 Size (5, -.93), Density (44.0, -.16),
 Constraint (73.2, 1.18)

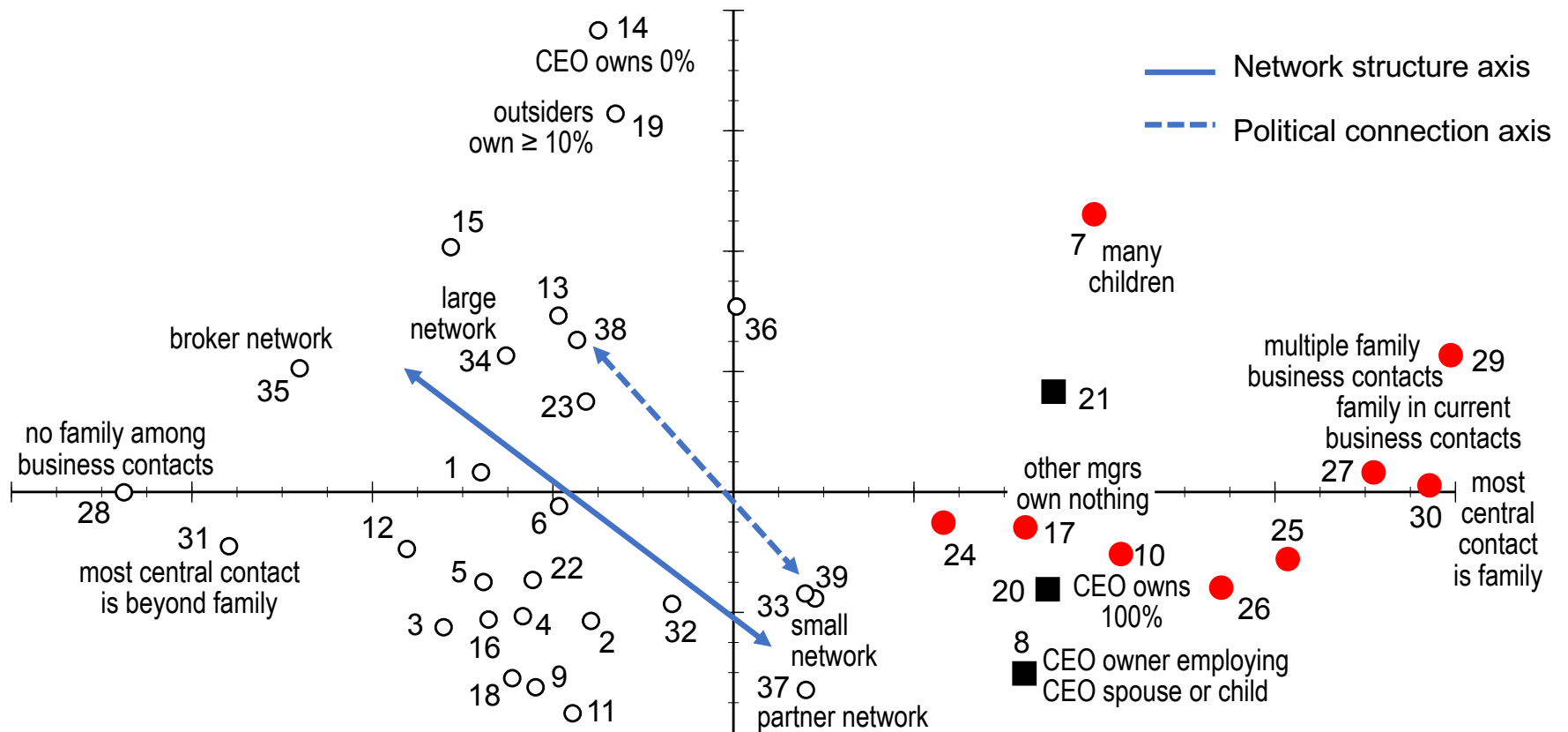


Figure 3.
A Cluster of Features Distinguish Family Firms

NOTE — Classical multidimensional scaling of Jaccard coefficients measuring the co-occurrence of the 39 Table 1 characteristics in 700 sample businesses. Characteristics that often occur together are close together in the figure. Axes are proportional in length to the eigenvalues defining them (5.39 for horizontal axis, 2.76 for the vertical). Axes cross at their zero point, with major intervals of .2 marked on both axes. Solid dots are index characteristics distinguishing family firms: (7) three or more children, (8) owner operated business employing spouse or child, (10) respondent owns 100% of business, (17) other managers own none of the business, (20) spouse is employee, (21) child is employee, (24) recruit employees from family, (25) family cited as key contact in founding the business, (26) family cited as key contact in significant event after founding, (27) family cited as key current contact, (29) multiple family among cited key business contacts, and (30) most central business contact is family.

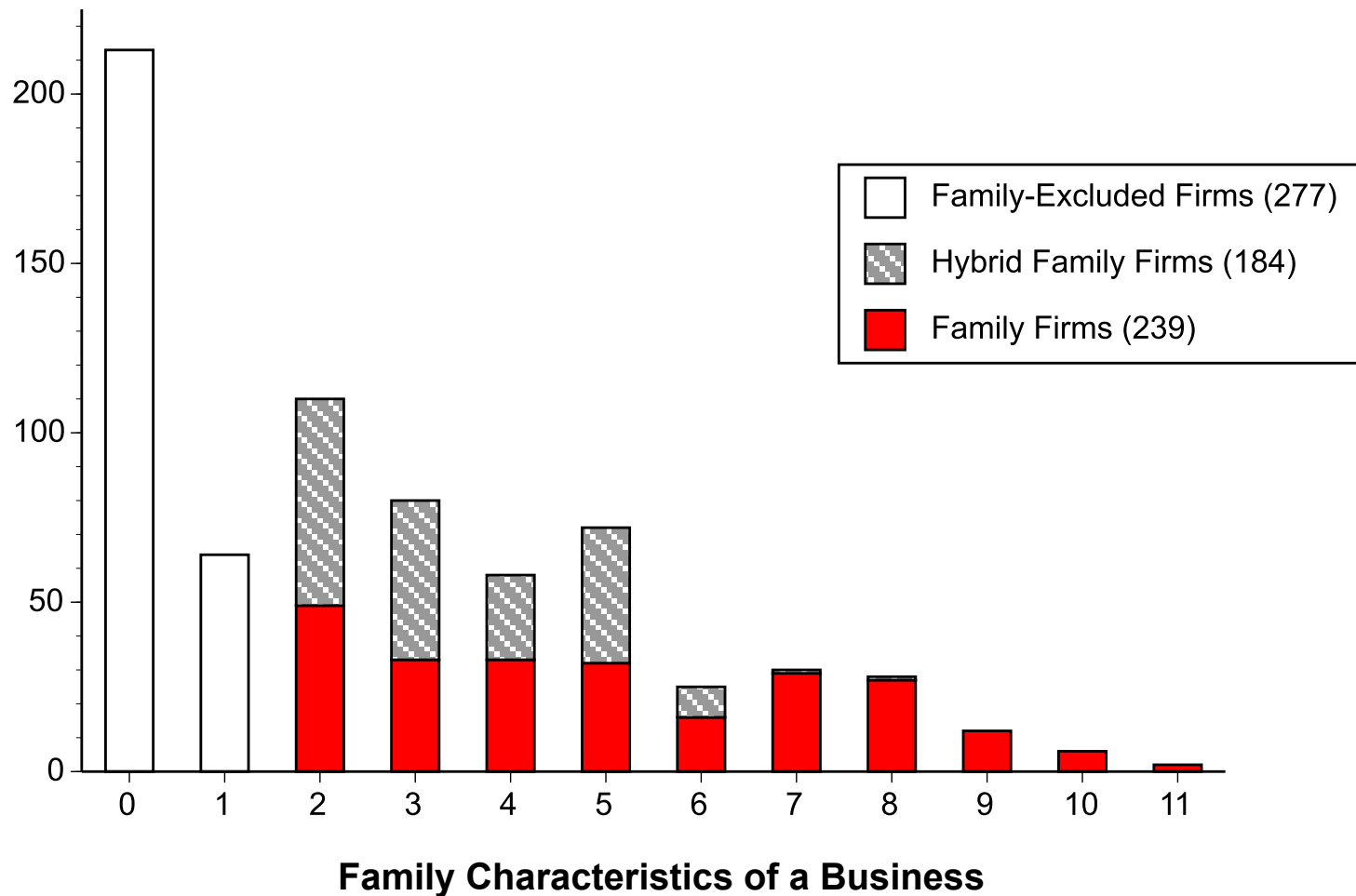


Figure 4.

Distinguishing Kinds of Businesses with Respect to Family

NOTE — Horizontal axis is the number of family characteristics a business has (solid-dots in Figure 3).

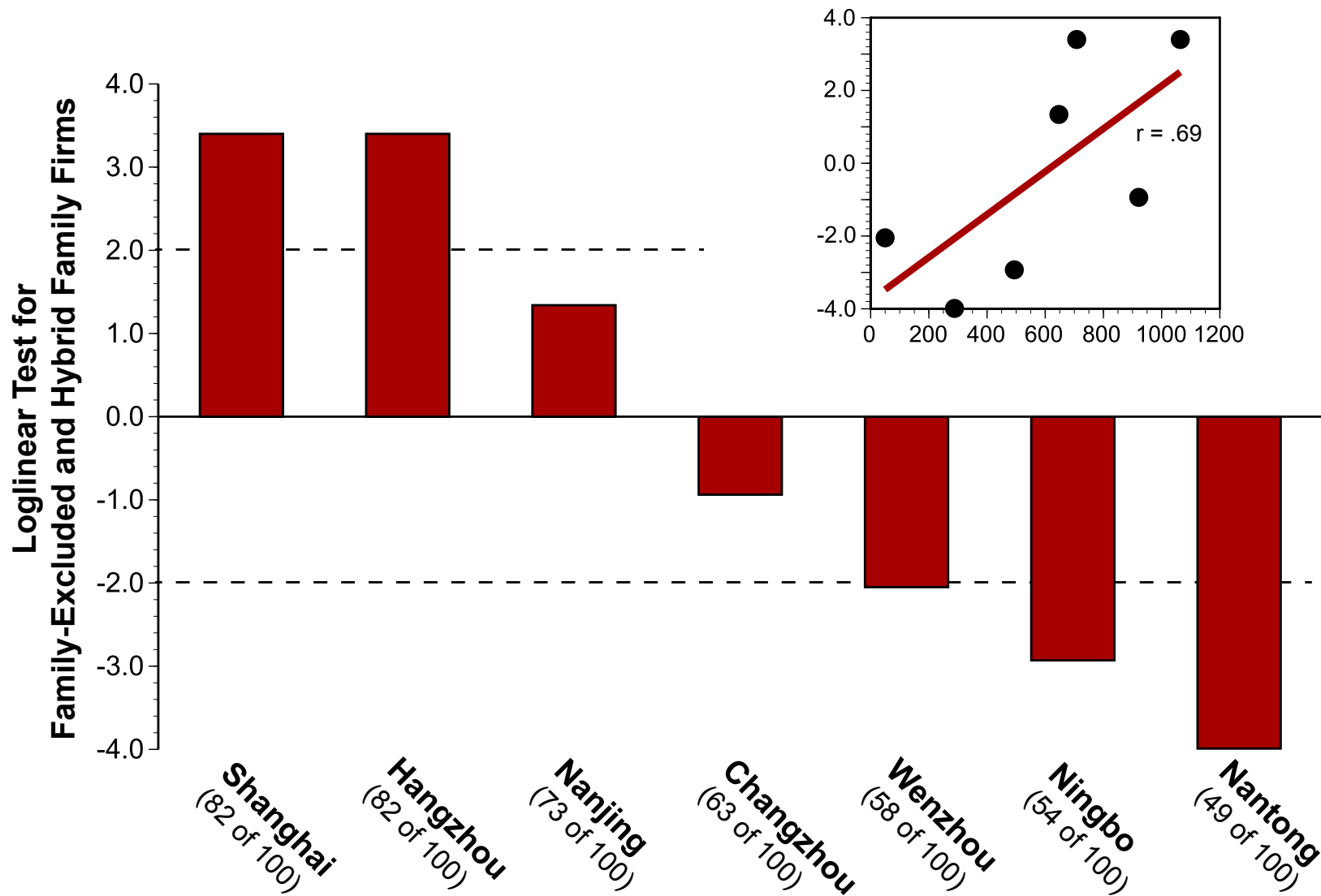


Figure 5.
Family-Excluded Firms and Hybrid Family Firms
Emerge in Provincial Capitals and Other Cities
Where Foreign Capital is Invested

NOTE — Inset graph is loglinear test across per capita foreign capital invested in city in survey year.

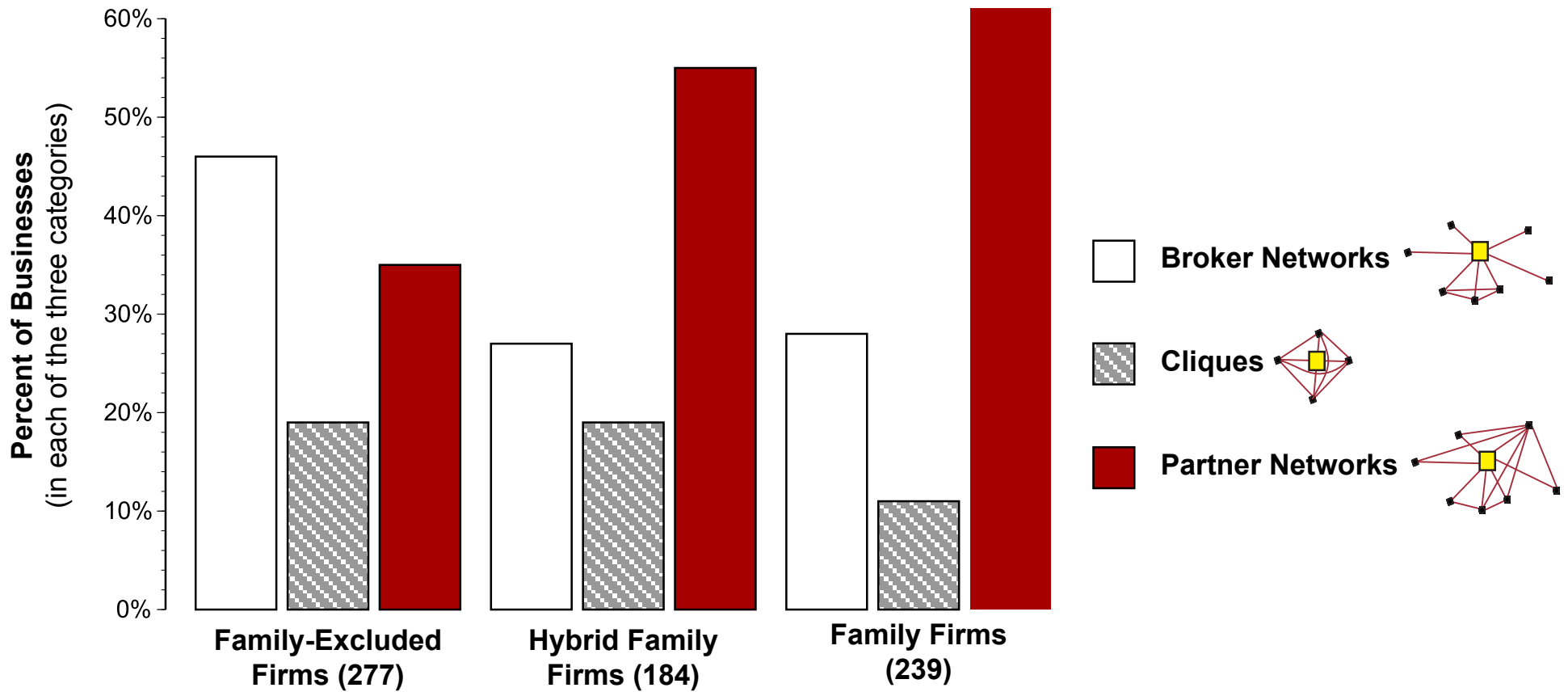


Figure 6.
Broker Networks with Family-Excluded Firms,
Partner Networks with Hybrids and Family Firms

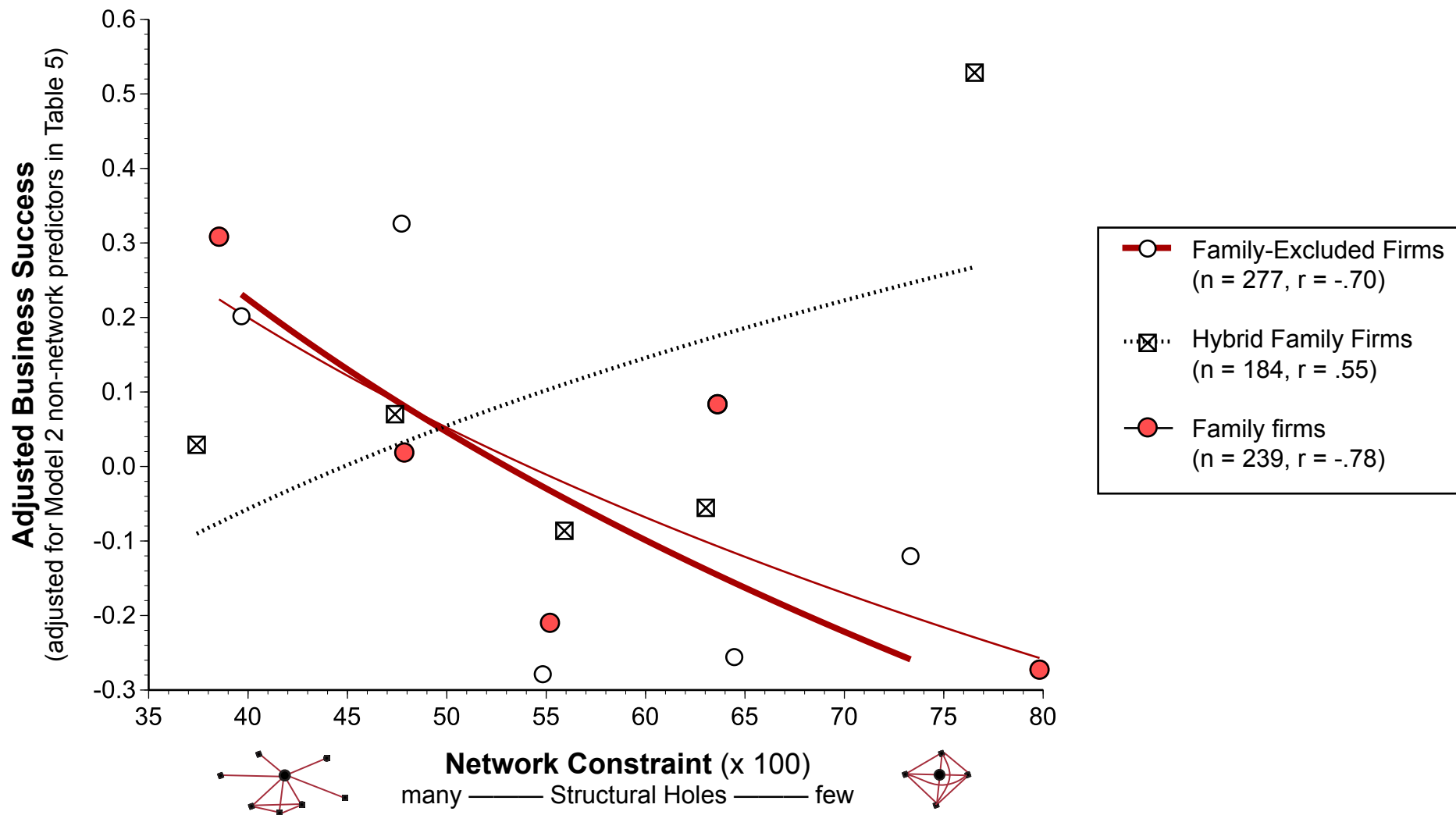


Figure 7.

With Respect to Network Advantage, Hybrid Family Firms Most Stand Apart from Family and Family-Excluded Firms

NOTE — Vertical axis is business success adjusted for the non-network baseline predictors in Model 2, Table 5. Scores on the vertical and horizontal axes are averaged within the five quintiles of network constraint. Regression lines and correlations are computed using log network constraint with the plotted data.