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Financing from Family and Friends

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Financing from Family and Friends

Finance Working Paper N° 358/2013

May 2013

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We thank François Degeorge, Xavier Giné, Kathleen Hagerty, Cam Harvey, Mitchell Petersen, Uday Rajan, Yochanan Shachmurove, Joacim Tåg, and especially Heitor Almeida and Thomas Noe, as well as seminar participants at the 2012 AEA Annual Meeting, the 2012 NBER Summer Institute Entrepreneurship Working Group Meeting, the 2012 EFA Annual Meeting, the 2012 Corporate Finance Conference at the Olin School of Business, the 2012 Miami Behavioral Finance Conference, the City University of New York, the Kellogg School of Management, the London School of Economics, and the Research Institute of Industrial Economics (IFN) for helpful comments.

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Abstract

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Keywords: Informal Finance, Family Loans, Social Ties, Altruism, Peer-to-Peer Lending, Small Business, Entrepreneurial Finance, Microfinance, Missing Middle, Financing Gap, Risk Capital, Social Collateral

JEL Classifications: G32, G21, O16, O17, D19, D64

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You must take risks, both with your own money or with borrowed money.
Risk taking is essential to business growth.
— J. Paul Getty

Neither a borrower nor a lender be;
For loan oft loses both itself and friend.
— Hamlet, Act I, Scene 3

1 Introduction

Many developing economies have a top and bottom heavy firm size distribution, indicating a shortage of small and medium-sized enterprises (SMEs), referred to as the “missing middle.”¹ Because the largest firms use formal finance while the smallest rely heavily on informal finance, one common explanation for the missing middle is that insufficient access to (formal or informal) finance – a financing gap – prevents small firms from growing. This has led to policy efforts to expand access to the formal financial sector.

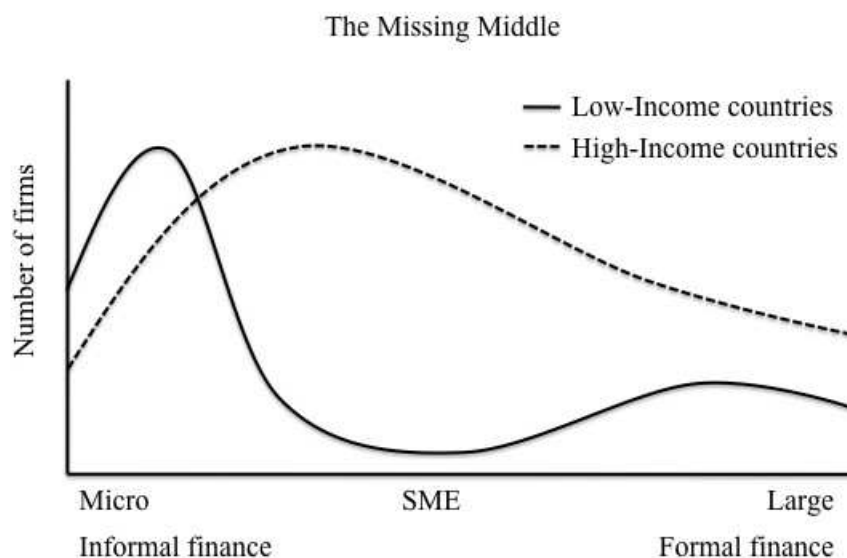


Figure 1: Stylized firm size distributions in high-income and low-income countries (adapted from the website of the Entrepreneurial Finance Research Initiative, Center for International Development, Harvard University). Firm size and predominant source of financing are on the horizontal axis, and the number of firms is on the vertical axis.

¹See Ayyagari et al. (2007) and International Finance Corporation (2009) for evidence and a discussion of the missing middle. As regards the economic importance of the SME sector, according to the Organization of Economic Cooperation and Development (OECD (2006)), SMEs are the dominant form of business in the OECD countries, accounting for over 95% (and depending on the country for up to 99%) of enterprises, and for 60 to 70 percent of net job creation.

But it has also raised questions about the funding that *is* available to small firms. According to survey estimates from the Global Entrepreneurship Monitor (GEM), several million companies in 42 countries received \$600 billion from 208 million informal investors in 2006 (Bygrave and Quill (2006)).² How can informal finance exist where formal finance cannot? And, given that, why does it not close the financing gap? The standard answer to the first question is that informal investors have information or enforcement advantages that allow them to reduce contracting frictions such as moral hazard or adverse selection. The standard answer to the second question is that informal investors have insufficient funds, and thus a very high cost of capital. In short, informal funds are limited and costly, and this lack of supply constrains investment. Let us refer to the combination of these two answers as information/cost theories.

Relationship to entrepreneur	Percent total	Mean amount US\$	Median payback time	Median times return
Close family	49.4%	23,190	2 years	1x
Other relative	9.4%	12,345	2 years	1x
Friend, neighbor	26.4%	15,548	2 years	1x
Work colleague	7.9%	39,032	2 years	1x
Stranger	6.9%	67,672	2-5 years	1.5x
Total	100%	24,202	2 years	1x

Table 1: Between 60 to 85 percent of the informal investors surveyed in the 2004 GEM study were relatives or friends of the entrepreneur they financed, and the median informal investor (in every category other than “stranger”) merely recovered the investment, implying that half of the informal investors earned negative returns (Bygrave (2004)).

While accurate for informal moneylending, this account is at odds with some common aspects of financing from family and friends (hereafter, family finance), which constitutes the bulk of informal finance (Table 1). First of all, family finance is cheap. Many of the informal investors in the GEM survey willingly accept low or negative returns (Bygrave (2004): 17) and family loans among the poor are frequently interest-free (Collins et al. (2010): Chapter 2).³ As the Wall Street Journal (2012) writes, “budding entrepreneurs” often turn to the “Bank of Mom or Dad” for a “dream-come-true interest rate.”⁴ If family finance suffers fewer contracting problems *and* is cheaper than formal finance, one would expect it to be first choice: borrowers should prefer and exhaust it.

Paradoxically, it often is not. Guerin et al. (2011), for example, found that, when asked whom they would approach first for money, only 28 percent of surveyed rural Indian households mentioned kin and many said that they dislike going into debt inside their family circle:

²By comparison, across all 85 GEM countries, formal venture capitalists invested \$37.3 billion into 11,066 companies in 2005, of which 71% was invested in the United States. Informal finance is probably most important in developing countries. The Global Financial Inclusion Database, which covers 184 countries, estimates that, in developing countries, currently 59% of adults have no bank account and 55% of borrowers use only informal sources of credit (Demirguc-Kunt and Klapper (2012)).

³Figure 2 shows that many informal investors in the GEM survey were *expecting* negative returns.

⁴Below market and interest-free loans among family members are so common that there has been intensive legal debate on whether to tax them as loans or gifts (see, e.g., Hutton and Tucker, 1985).

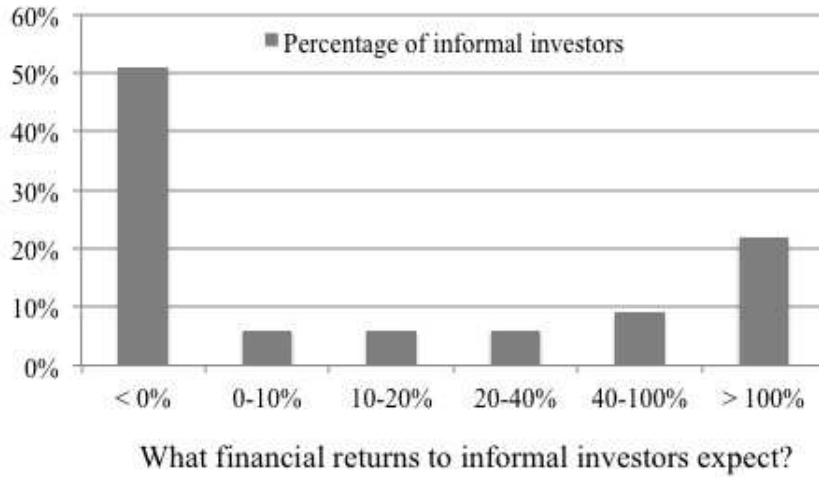


Figure 2: Expected returns reported by the informal investors in Bygrave (2004).

It's better to borrow from outside [vellilla] than relatives [sontham].

In the GEM survey, the largest informal investments come from strangers, not relatives or friends, even though the required return increases with the investor's social distance to the entrepreneur. As the most likely reason, the survey does not cite limited family funds but rather that "investments in strangers are made in a more detached and business-like manner" (Bygrave (2004): 17). Similarly, business experts urge entrepreneurs to "think twice before borrowing from family" and see family finance as "a last resort, not a first resort" (BusinessWeek (2006)).⁵

This suggests, first, that family finance comes with shadow costs and, second, that the origin of these costs is compatible with the observed below market, often even negative, required returns. Information/cost theories of informal finance cannot match these facts: there, the aspects that make informal finance less attractive (e.g., greater risk aversion of informal investors, monitoring costs, social penalties, etc.) imply a premium on required return. Thus, the typical prediction is that, if a borrower uses *both* informal and formal finance, informal finance is not less expensive. Moreover, if it were cheaper, it would be preferred, not avoided.

In this paper, we propose a model of external finance in which informal (kinship or friendship) relations are characterized by social preferences. This is the single assumed difference between informal and formal finance; in particular, the informal lender has no informational or cost advantages. The central message of our paper is that, when the informal relationship is characterized by social preferences, we can account for both negative required returns and shadow costs. Further, we show that family finance – for reasons inherent in its modus operandi – is a good source of *trust* capital

⁵In a similar vein, while documenting financial decisions of households in developing economies over several years, Collins et al. (2010) found that family finance, though the most prevalent and usually cheapest form of (informal) finance, is frequently not the most preferred: "[Somnath from Delhi] avoided recourse to relatives at all costs, because he was ashamed and anxious that, if he couldn't repay on time, he would strain the relationship. Similar feelings were voiced by as many as half the Delhi respondents: they would go to several informal sources (colleagues, neighbors, the grocer, one's employer) before they would resort to relatives".

but not of *risk* capital. While family finance increases access to funds, it can thus constrain risk taking and, ultimately, stifle investment. Our message is important in that it emphasizes the value of *impersonal* transactions, such as channeling risk out of the borrower's social circle and immunity to social tensions. While many information/cost theories advocate contractual innovations that harness or emulate the power of social relations, our theory advertises quite the opposite: using formal contracts and neutral third parties to mitigate the drawbacks of mixing social relations with financial transactions.

We depart from a standard moral hazard model of external finance (à la Holmstrom and Tirole (1997)) in which an entrepreneur can approach two investors, a family member (friend) and an outsider. We study, in turn, three different characterizations of the social preference relation between family members, and demonstrate the insights in each of them.

In the first characterization, family members simply exhibit standard altruistic preferences with respect to each other; the outsider has no such ties.⁶ In the absence of moral hazard, altruism only affects the entrepreneur's choice of finance if the family investor is sufficiently altruistic to make charitable transfers to him also in the absence of any investment opportunity (in at least some states of the world).⁷ Then, stronger altruism makes family financing *less* attractive, because investing family wealth in the risky project reduces the amount of intra-family "insurance" available to protect the entrepreneur against bad states of the world. This represents a shadow cost of family finance, which ironically arises precisely because family members have the propensity to be generous to each other. The first best outcome is thus that the entrepreneur exclusively uses outside finance. In the presence of moral hazard, this may be infeasible. Two questions arise in this case: Can or will the entrepreneur use family finance instead? And if so, at what price? The lack of outside finance lowers the outside options in the family's participation constraints, so the family investor becomes willing to fund the project even at a negative financial return in order to "help" the entrepreneur. Family finance also relaxes the entrepreneur's incentive compatibility constraint since she must repay less, has less intra-family insurance to fall back on if the project fails, and partly internalizes the impact of a default on the family investor. When needed, family finance is thus cheaper and mitigates moral hazard. Still, *conditional* on incentive compatibility, the entrepreneur's expected utility is lower – and thus her participation constraint tighter – when using family finance, due to the shadow cost.

Through the above effects, the single assumption of standard altruism between family members leads to a non-trivial set of predictions about the second best outcome:

- (1) *Coexistence*. Both family and formal finance are used, sometimes simultaneously.
- (2) *Financial deepening*. Some projects cannot be undertaken without family finance.
- (3) *Co-signing*. Family finance helps raise outside finance.
- (4) *Negative returns*. Family investors accept negative expected returns.

⁶Altruistic behavior has been documented for a wide range of organisms. See Trivers (1971), Becker (1976), and Axelrod and Hamilton (1981) on sociobiological explanations of altruism, especially among kin, including *kin selection*, *reciprocal altruism*, and *inclusive fitness*.

⁷Otherwise, altruism is irrelevant to financing. On one hand, the family investor demands exactly the same repayment as the outsider, since he sees no reason to be generous given that the entrepreneur can turn elsewhere to profitably finance the project. On the other hand, the entrepreneur prefers paying the family investor (rather than the outsider) exactly as much as she dislikes using his (rather than the outsider's) wealth to finance the project; she is therefore indifferent between the two sources of finance.

(5) *Pecking order*. Despite its lower required returns, family finance is less preferred.

(6) *Risk taking*. Some projects are not undertaken without outside finance.

This altruism-based theory matches three main predictions of information/cost theories ((1)-(3)). The other predictions are new ((4)-(6)): Family and friends provide finance at negative rates of return; but the entrepreneurs nonetheless prefer outside finance; and they may even forgo risky investments if they have to rely exclusively on family finance. These predictions derive from a shadow cost generated by the model that seems both intuitive – intra-family resources are “emergency funds” that borrowers are reluctant to deplete⁸ – and realistic, as the following quote suggests:

Sultan explained this reluctance, telling us that, although he has many relatives living close by who are in a better financial position than he, he avoids taking money from them. These relatives provide support out of love and duty, he told us, a kind of *social security* (Collins et al. (2010): 55, emphasis added).

In our second characterization of the social preference relation, we allow family members to partly internalize each other’s material payoff (instead of utility). In this model, no charitable transfers arise. However, the family members do not necessarily agree on what is best for each other; for example, a parent may want its child to bear less or more risk than the child would choose for itself. In the presence of such *paternalism* – which is absent under standard altruism – the borrower’s expected altruistic utility from paying the family investor his required return does not necessarily equal her expected altruistic disutility from gambling his money. In the first best outcome of this model, the entrepreneur may hence prefer outside finance even though no intra-family insurance exists. Again, a shadow cost of altruism emerges, and here it is purely emotional: Even at contract terms acceptable to the family investor, the entrepreneur may feel as if she would impose “too much” risk on the family. She has no such concerns when selling the risk to the outsider, because she does not care about him.

Paternalistic altruism between family members has, in the second best outcome, the same three-fold effect on the family members’ participation constraints and the entrepreneur’s incentive compatibility constraint as standard altruism, thus reproducing predictions (1)-(6). The difference is that, in this model, it is out of concern for her family and friends that the entrepreneur prefers to sell the project risk to outsiders. We call this “social risk aversion.” Contrary to the emergency funds motive, social risk aversion increases with the entrepreneur’s altruism toward the family investor. This shadow cost seems realistic as well:

Family members do things out of love and have been known to take that to an extreme, offering up more than they truly can afford to. No one ever wants to put a relative in a bad financial situation. It can be tough to tell the truth of the matter, but make sure that if you’re borrowing money from a family member, it won’t cause issues for them (Bram (2010)).

The two characterizations above formalize charity or concern based on *unconditional* altruism. But not all social transactions, even among friends or relatives, operate on this principle or involve

⁸For parent-child relations, an alternative interpretation of the shadow cost is to see family finance as “early bequest.” The aversion to family finance then reflects the reluctance to “gamble” one’s own bequest on a risky project.

such unswerving feelings. Much voluntary cooperation involves some form of reciprocity. In the third model, we hence consider informal finance as a *gift exchange* (Akerlof, 1982). Applying this idea to labor markets, Akerlof posits that employees who are paid above market wages reciprocate the “gift” by working harder as they develop positive sentiment or adhere to a reciprocity norm. Translating the idea to informal financial markets, we posit that borrowers who are financed at below market rates reciprocate the gift by working harder to repay those lenders – e.g., by paying them “favors” if insolvent – provided that successful reciprocation preserves positive sentiment between lender and borrower.

Formally, in our third characterization of the social preference relation, we assume *reciprocal* altruistic preferences (as modeled by Levine (1998)) between the entrepreneur and the family investor. Under these preferences, one person’s effective altruism towards another depends on the primitive altruism parameters of both; people are more sympathetic toward those that are sympathetic toward them. Moreover, we assume that failure to reciprocate a gift reduces the counterparty’s primitive altruism. This can sustain a gift exchange because the quality of the altruistic relationship serves, in effect, as ‘social collateral’ (cf. Karlan et al. (2010)).

The gift exchange model also generates both negative financial returns and shadow costs. In the first best outcome, the family investor requires a lower repayment than the outsider, but the entrepreneur uses outside finance. The required repayment is lower because a gift exchange reduces the default premium; moreover, to outside observers, the family investor may appear to accept negative returns since, unlike quoted rates, reciprocation is difficult to observe. Still, if favors are costly – inasmuch as the entrepreneur would rather settle debt in cash than pay commensurate favors – family finance is less attractive. This holds true also for the family investor who wants to be repaid but, due to the altruism, internalizes that favors cost the entrepreneur. So, neither family member wants to enter a gift exchange when outside finance is feasible.

In the second best outcome, family finance relaxes the entrepreneur’s incentive compatibility constraint because the social obligations owed to family members upon default undermine limited liability and, moreover, are costly. While this provides a role for family finance, conditional on incentive compatibility, outside finance is still preferred. This model thus produces (1)-(6), too. The logic of the gift exchange is that family debt “never really goes away.” Seemingly lenient, family finance breeds emotional tensions that make the obligation *persistent*. Such persistence accounts for quasi-negative returns, positive incentive effects, and – as the following quote illustrates – shadow costs:

I felt that I had to please my lender and do everything that he suggested. I felt like I could not oppose this person in any way ... If you lend money to a friend or family member, beware that you may not get your money back and your relationship may never go back to normal. This will cause tension between you and the borrower, and may also cause guilt, remorse, and anger (Slide, 2011).

Collins et al. (2010) and Guerin et al. (2011) quote similar concerns – about the threat of losing relationships or tensions within – as justifications for avoiding family finance.

The above social preference models are distinct from information/cost theories, and may in many cases be a more fitting description of informal finance, since they naturally predict negative returns as well as shadow costs. The unified picture that emerges is that family finance can increase access to funds, but at the price of reduced risk-taking. To mitigate this negative impact of family financing, even counterparties with social ties benefit from formal contracts and third-party intermediaries.

This may speak both to the limited success of group-based microfinance in generating entrepreneurial growth, and to the emergence of financial institutions that combine formal intermediation with social relations, such as community funds, social lending intermediaries, and crowd funding.

2 Related literature

2.1 Theories

Existing theories argue that informal finance relaxes capital constraints for two reasons. One strand focuses on information advantages: Informal lenders have superior information or lower monitoring costs, which reduce moral hazard, adverse selection, or state verification costs (Stiglitz (1990), Varian (1990), Banerjee et al. (1994), Jain (1999), Mookherjee and Png (1989), Prescott (1997), Gine (2011), Ghatak (1999)). The other strand posits that social ties reduce moral hazard through the threat of social sanctions, modeled as a cost to the defaulting borrower (Besley and Coate (1995), Besley et al. (1993)). In a recent paper, Karlan et al. (2009) embed such sanctions in a social network model where social ties serve as social collateral and show how the network structure influences transactions. Existing theories that focus on trade-offs between formal and informal finance usually assume that informal financiers have a higher cost of capital because of monitoring costs, risk aversion, or illiquidity. While the above models are able to describe many aspect of informal finance, they cannot explain the negative returns common in family finance, that borrowers may opt for formal finance even when they could obtain family finance at below market rates, or formal intermediation between relatives or friends. Our social preference models are, to our knowledge, also distinct in their prediction that family finance discourages entrepreneurial risk taking.

In general, the existing literature has focused mainly on the benefits rather than the costs of social ties in financing. For example, Ghatak and Guinnane (1999: 221) write in their survey that “the literature on group lending shies away from discussing the possible negative implications of peer pressure.” The models in this paper focus explicitly on such shadow costs of mixing social relations and financial transactions, and on the advantages of formal contracts and arm’s-length relationships.

The literature on family firms models the family as a unified entity (Burkart et al. (2003), Almeida and Wolfenzon (2007)). Some recent papers study governance issues in family firms assuming family members need not act in unison (Lee and Persson (2011), Noe (2011)). The broader literature on family economics has moved from Becker’s (1973) *unitary* model of the household, which treats the family as a single decision maker, to the *collective* model of the household, which brings individual preferences, conflicts, and bargaining powers to the fore (see Browning et al. (2012) and the references therein). Still, even while emphasizing intra-family conflicts, the collective model assumes that the household always achieves Pareto efficiency. This assumption has been challenged empirically (e.g., Udry (1996), Duflo and Udry (2004), Ashraf (2009), Ashraf et al. (2010), and Schaner (2012)), and recent papers propose household models in which intra-family conflicts entail inefficiencies (e.g., Konrad and Lommerud (1995), Lundberg and Pollak (2003), Basu (2006), and Hertzberg (2012)). A distinct feature of our models is that the family relationship is both a solution and a problem and that sometimes, ironically, the empathy rather than the conflict between family members causes the problem.⁹

⁹The only other claim we have found to the effect that altruism causes problems is a conjecture in Schulze et

2.2 Empirics

First, there is evidence that financial transactions can affect social relationships. In the context of group lending, Montgomery et al. (1996) report real-world cases where the reliance on peer pressure damaged relationships *ex post* and even provoked violence, and Karlan (2007) reports systematic evidence that relationships between group members deteriorate after default. Complementing these findings, Feigenberg et al. (2010) document that group lending can improve relations among group members, which does not preclude the possibility that defaults under joint liability are harmful to such relations; on the contrary, it suggests that relationship qualities are not exogenous. In the context of family finance, Rosenblatt (1991) provides examples of social tensions rising as economic difficulties endanger the financial arrangements.

Second, there is anecdotal and survey evidence that borrowers avoid family finance (Collins et al. (2010), Guerin et al. (2011)). We know of no evidence from large sample data on firm financing. However, using the Kauffman Firm Survey, Robb and Robinson (2012) find that the startups in their sample rely much less on funding from family and friends than expected, and much more on bank financing. Petersen and Rajan (1994) report evidence suggesting that firms follow a dynamic “pecking order,” borrowing first from family and friends and then progressively switching to more arm’s length sources. Similarly, using the World Bank Enterprise Surveys of about 70,000 firms – primarily SMEs – in 104 countries, Chavis et al. (2010, 2011) find that, while young firms use more family finance than formal (bank) finance, this financing pattern reverses over time: as the firms age, they replace family finance with bank finance. These empirical patterns are consistent with the hypothesis that entrepreneurs, though often dependant on family finance, prefer formal finance especially for risky investments and growth.

Third, there is suggestive evidence that family finance may reduce risk taking. Studying a large sample of private firms across Europe, Belenzon and Zarutskie (2012) show that family firms are more stable and liquid but also tend to grow more slowly. Moreover, these characteristics especially distinguish family firms that are at early stages of their life cycle and jointly owned by a married couple.¹⁰ The authors suggest that family ties, particularly marital ties, lead to higher operating efficiency and more conservative liquidity management, which reduces failure but also dampens investment and growth. Romano et al. (2000) find that small firms are less likely to utilize family finance when pursuing growth through new products or new process development. Saidi (2012) reports evidence from Amazonian hunter-gatherer societies that villagers who practice cross-cousin marriage, and are therefore more socially connected, provide each other with more informal finance but also invest in more traditional, safer activities. Similarly, Guerin et al. (2011) find in their survey among rural Indian households that family finance serves mainly consumption and insurance (“ceremonies, health, and housing maintenance”), while investment (“investments, house purchases, ... and cattle purchase”) is financed mainly through banks. Direct evidence on social risk aversion comes from large-scale experiments on delegated risk taking by Andersson et al. (2013), who find that altruism reduce a subject’s inclination to take risks on behalf of others.

al. (2001) that altruism between family members may soften rather than strengthen discipline. Alger and Weibull (2010) confirm this conjecture in a model where altruism has a non-monotonic effect on *ex ante* incentives because of the incentives to help each other out *ex post*.

¹⁰Some other studies on family firms discuss more generally the idea that family involvement can have a “dark side” (Schulze et al. (2001), Bertrand and Schoar (2006), Bertrand et al. (2008)). Bertrand and Schoar (2006) report empirical patterns consistent with the idea that “family values” negatively affect firm value, while evidence in Bertrand et al. (2008) suggests that conflicts between multiple heirs damage family firms.

A recent debate is interesting in this respect: Allen et al. (2005) argue that, lacking a well-developed formal financial system, China’s private sector has grown through informal finance. Challenging this view, Ayyagari et al. (2010) find growth in a sample of 2,400 Chinese firms to be concentrated among the (few) firms that use bank finance.¹¹ They also propose three instrumental variable regressions and report that the positive relationship between formal finance and growth survives, suggesting the interpretation that, apart from access to finance, the *type* of finance – formal or informal – has a causal impact on firms’ investment policy and growth.

All of the above is suggestive but none are direct tests of the predictions presented in this paper. In Section 6.1, we speculate about ways to directly test our predictions.

3 Benchmark model with egoistic preferences

As the basic framework, we use a simple moral hazard model of entrepreneurial financing. There is a “poor” entrepreneur A with a project idea. She has no initial wealth to cover the outlay I needed to start the project. There are two potential financiers: an outside investor such as a bank, called O, and a “wealthy” friend or relative, called F, who can dispose of up to W of his wealth to support A.

Once financed, the project is subject to moral hazard: A can divert the payoff created by the project as a private benefit. Specifically,

- If A *works*, the project yields no private benefit but a cash flow $\tilde{R} \in \{R, 0\}$ with $R > 0$ and $\Pr(\tilde{R} = R) = q$.
- If A *shirks*, the project yields no cash flow but a private benefit $\tilde{B} \in \{B, 0\}$ with $B \geq 0$ and $\Pr(\tilde{B} = B) = q$.¹²

Shirking is inefficient, that is, $R > B$.

O is risk neutral. To eliminate financing choices driven by differences in the investors’ risk bearing capacities, we also assume that F is (sufficiently wealthy to be) risk neutral (over W). Let w_i and $u_i(\cdot)$ denote, respectively, individual i’s terminal wealth and *selfish* utility function. We assume $u_O(\cdot) = \cdot$; $u_F(\cdot) = \cdot$. In contrast, we assume that A, being poorer, is risk averse and has a higher marginal utility of consumption; $u'_A > 0$, $u''_A < 0$, and $u'_A(R) > 1$. To simplify the analysis, we assume the (Inada-like) conditions $u'_A(0) = \infty$ and $u'_A(\infty) = 0$, and normalize $u'_A(1) = 1$.

For some of our results, it will be important that the investors are less risk averse than the entrepreneur. The assumption that they are risk neutral simplifies matters. Without it, there is a rationale for spreading risk across investors, that is, for co-financing. The risk neutrality assumption allows us to focus on co-financing choices that are driven by *social* preferences alone.

Let I_i denote the amount that investor i invests in the project. Investor i’s repayment is denoted by $\tilde{R}_i \in \{R_i, 0\}$, where $\tilde{R}_i = R_i \in [0, R]$ only if the project yields $\tilde{R} = R$.

¹¹In addition, they report (Table 7, Panel B) and discuss (3090) the following results: Business growth is associated with neither of two measures of “self-financing,” one of which includes family finance; one of the self-financing measures is associated with a higher profit reinvestment rate, but this is mainly driven by the inclusion of internal financing (rather than family finance) in the variable; the same measure is also associated with increases in productivity, which suggests that internal and family finance leads to more efficiency; but these correlations with reinvestment and productivity occur only in the *smallest* quintile of firms.

¹²The assumption that the private benefit is random simplifies the analysis but is not crucial.

We assume that selfish investors would be willing to provide exclusive financing if A could commit not to shirk:

Assumption 1. $E(W - I + \tilde{R}) \geq W$, that is, $R \geq I/q$.

Assumption 1 does not imply that A would self-finance the project, since she is risk averse. With limited liability, a selfish A accepts any external financing though.

In the absence of social preferences, the outcome is simple. Suppose A faces investor i. Due to the moral hazard problem, the project is financed only when A's incentive compatibility constraint, i's participation constraint, and the budget constraint,

$$\begin{aligned} E[u_A(\tilde{R}_A)] &\geq E[u_A(\tilde{B})] \\ E(W - I + \tilde{R}_i) &\geq W \\ R_A + R_i &\leq R, \end{aligned}$$

can be jointly satisfied.

Lemma 1. (Selfish financing) *A selfish investor exclusively finances a selfish entrepreneur if and only if $R \geq I/q + B$.*

This condition is stricter than Assumption 1, yielding the standard result that moral hazard can cause the entrepreneur to be capital-constrained. Moreover, note that, as O and F have the same information and the same selfish preferences, it does not matter who finances the project.

4 Financing and social preferences

4.1 Financing with standard altruism (Model 1)

In this section, we consider standard altruistic preferences:

$$U_i = u_i(\tilde{x}_i) + a_{ij}U_j \quad \text{for } i \neq j$$

where $a_{ij} \in [0, 1]$ measures i's altruism toward j. This utility function can be rewritten as a weighted average of the individuals' selfish utility functions:

$$U_i(\tilde{x}_i, \tilde{x}_j) = e_i u_i(\tilde{x}_i) + (1 - e_i) u_j(\tilde{x}_j) \quad \text{for } i \neq j \quad (1)$$

(see Hawkins and Simon (1949) or Nikaido (1968)). Here, $e_i \in (1/2, 1]$ reflects the degree of egoism i exhibits vis-à-vis j; a lower e_i means that i is more altruistic toward j.

We assume that only A and F are altruistic toward each other, and that the altruism is symmetric: $U_A(\tilde{x}_A, \tilde{x}_F) = e u_A(\tilde{x}_A) + (1 - e) u_F(\tilde{x}_F)$ and $U_F(\tilde{x}_F, \tilde{x}_A) = e u_F(\tilde{x}_F) + (1 - e) u_A(\tilde{x}_A)$. O remains purely selfish. The investors still have the same selfish preference component. They differ only in their relationship to A.

4.1.1 First best choice

To build intuition, we first examine what the outcome would be in the absence of moral hazard, i.e., when $B = 0$. The main question in this case is how the altruism affects A 's preference over the two financing sources: Does A prefer “family finance” from F , with whom she has an altruistic relationship, or “outside finance” from O , whom she does not care for and who does not care for her?

Suppose F and A would not exchange any transfers outside a financing arrangement, so that the outside option in F 's participation constraint is that F keeps W and O funds the project. Checking for which R_O and R_F the investors' participation constraints bind in this case yields the following auxiliary result.

Lemma 2. *Suppose $B = 0$. Let $R_i^+(l_i)$ denote the smallest promised repayment such that investor i agrees to exclusive financing, assuming that no transfers occur without the financing contract. Then, $R_O^+(\hat{l}) = R_F^+(\hat{l})$. A would be indifferent between these two financing contracts.*

We derive this result here because it is instructive. For any amount of funding $\hat{l} \geq l$, O 's break-even condition is

$$qu_O(W - \hat{l} + R_O) + (1 - q)u_O(W - \hat{l}) = u_O(W). \quad (2)$$

Similarly, defining $\Delta_I = \hat{l} - l$, F 's break-even condition is

$$q[eu_F(W - \hat{l} + R_F) + (1 - e)u_A(R + \Delta_I - R_F)] + (1 - q)eu_F(W - \hat{l}) = eu_F(W) + q(1 - e)u_A(R + \Delta_I - R_O), \quad (3)$$

taking into account that A is funded by O if F refuses to invest. This system of equations, (2) and (3), for R_O and R_F has at most one solution (see Appendix). Conjecturing that $R_O = R_F$ reduces (3) to

$$qu_F(W - \hat{l} + R_F) + (1 - q)u_F(W - \hat{l}) = u_F(W). \quad (4)$$

Given that O and F are identical with respect to selfish preferences, (4) is the same as (2), thus confirming the conjecture. It is noteworthy that this holds for any u_A and u_F , so long as they are the same.

Notwithstanding $R_O = R_F$, A may strictly prefer one of the financing sources due to the altruism. If financed by O , A 's expected utility is

$$E[U_A(\Delta_I + \tilde{R} - \tilde{R}_O, W)] = e[qu_A(\Delta_I + R - R_O) + (1 - q)u_A(\Delta_I)] + (1 - e)u_F(W). \quad (5)$$

By contrast, if financed by F , it is

$$E[U_A(\Delta_I + \tilde{R} - \tilde{R}_F, W - \hat{l} + \tilde{R}_F)] = e[qu_A(\Delta_I + R - R_F) + (1 - q)u_A(\Delta_I)] + (1 - e)[qu_F(W - \hat{l} + R_F) + (1 - q)u_F(W - \hat{l})],$$

which, due to (4), reduces to

$$E[U_A(\tilde{R} - \tilde{R}_F, W - \hat{l} + \tilde{R}_F)] = e[qu_A(\Delta_I + R - R_F) + (1 - q)u_A(\Delta_I)] + (1 - e)u_F(W). \quad (6)$$

Given $R_O = R_F$, (6) is identical to (5). Again, this is true for any identical u_A and u_F .

Lemma 2 may feel counterintuitive. On one hand, one might have thought F willing to provide funds at more attractive terms (than O) due to his altruism toward A . As we show later, F displays such generosity if A must forgo the project without funding from F . But here A can always resort to funding from O , and F is “happy” for A even if the project is financed by someone else. This increases F ’s reservation utility and thereby decreases her willingness to be generous. On the other hand, one might have expected A would rather share the project payoff with F , a “friend,” than with O , a “stranger.” Indeed, this would be the case if A were forced to give away money. But here she enters a *quid pro quo*; and as much as she prefers giving cash flow to F rather than to O when the project succeeds, she dislikes reducing F ’s rather than O ’s wealth to finance the project.

The financing terms in Lemma 2, under which the investor breaks even financially, are clearly those preferred by A when dealing with O . Due to altruism, however, it is a priori unclear whether such terms reflect the optimal arrangement between A and O . It is for this reason that Lemma 2 actually need not represent A ’s equilibrium preferences over the financing sources, but merely an interesting benchmark.

The key is to see that the allocation implemented by the contracts in Lemma 2 is not necessarily ex post optimal inasmuch as, prior to consumption, A or F may engage in charitable “intra-family” transfers because of their altruism – even absent the investment or outside any financing arrangement. To see this, define A and F ’s disposable “family wealth,” $\Pi_{AF} \equiv \pi_A + \pi_F$, and their “family utility,” $U_{AF} \equiv U_A(\pi_A, \pi_F) + U_F(\pi_F, \pi_A) = u_A(\pi_A) + u_F(\pi_F)$, and consider how F would divide up the family wealth:

$$\max_{\pi_A \in [0, \Pi_{AF}]} U_F(\Pi_{AF} - \pi_A, \pi_A). \quad (7)$$

This problem has a unique solution.¹³ The first-order condition is

$$u'_A(\pi_A) = \frac{e}{1-e}. \quad (8)$$

This equation has a positive solution $\pi_A^{\min} > 0$ as $u'_A(0) = \infty$ and $u'_A(\infty) = 1 < \frac{e}{1-e}$, and the solution is unique since $u''_A < 0$. The solution to (7) is then $\pi_A^* = \min\{\pi_A^{\min}, \Pi_{AF}\}$. That is, ex post, F is always willing to make an intra-family transfer to A to ensure that A ’s consumption is no less than π_A^* . A would solve a similar problem. However, the first-order derivative of U_A with respect to π_A is $u'_A(\pi_A) - \frac{1-e}{e}$ and, given $u'_A(\infty) = 1 > \frac{1-e}{e}$, always positive; thus, A would retain Π_{AF} . Intuitively, our model assumptions are such that F is so wealthy as not to receive charitable transfers from A .

With this, we can construct *indirect* family utility U_{AF}^* as a function of family wealth, taking the optimal intra-family transfers into account. The derivation is simple (see proof of the next proposition) and, for the case in which such transfers ever occur, yields

$$U_{AF}^*(\Pi_{AF}) = \begin{cases} u_A(\Pi_{AF}) & \text{for } \Pi_{AF} \leq \pi_{AF}^{\min} \\ u_A(\pi_{AF}^{\min}) + \Pi_{AF} - \pi_{AF}^{\min} & \text{for } \Pi_{AF} > \pi_{AF}^{\min} \end{cases}. \quad (9)$$

The intra-family transfers make $U_{AF}^*(\Pi_{AF})$ concave and *strictly* concave for $\Pi_{AF} \leq \pi_{AF}^{\min}$ (see Figure 3). This is key to proving the next result.

¹³The domain is compact and $U_A(\pi_A, \Pi_{AF} - \pi_A)$ is continuous and quasi-concave in π_A .

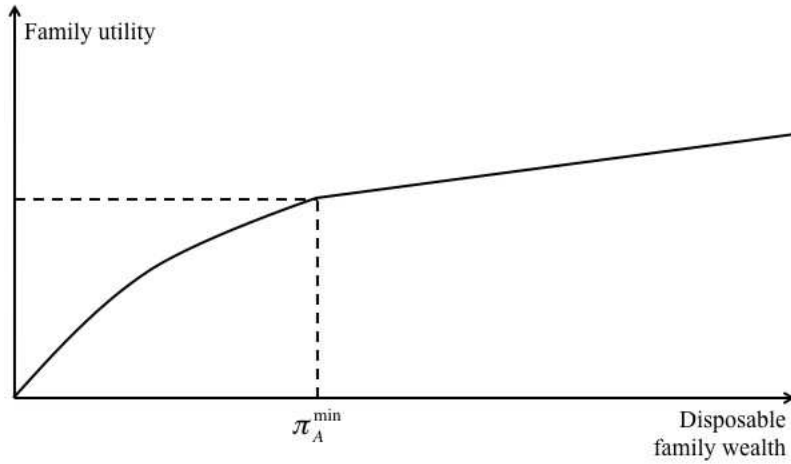


Figure 3: Family utility as a function of family wealth. The function is strictly concave below π_A^{\min} as all disposable family wealth up to π_A^{\min} is charity for A, who is risk averse.

Proposition 1. *For $B = 0$, A strictly prefers financing from O if $W - I < \pi_A^{\min}$ and is otherwise indifferent between the two financing sources.*

The altruistic preferences make family finance *less* attractive than outside finance. Altruism leads to charitable transfers from wealthy family members to the poorer ones. Family finance, that is, investing family wealth in a risky project introduces uncertainty into (the ability to make) intra-family transfers. In the model, family wealth is $W + qR - I$ under outside finance. Under family finance, it is $W - I + R$ with some probability and $W - I$ otherwise. When $W - I < \pi_A^{\min}$, a project failure ex post reduces the charitable transfer F gives to A, and ex ante, family finance thus reduces the informal “insurance” F extends to A. If so, expected family utility is lower under family finance than under outside finance, even though expected family wealth is the same under both.

Intuitively, A does not want to risk family funds on the project because they represent “emergency funds” that she can tap into during bad times. An alternative interpretation of charitable transfers is that F provides A with cheaper funds. However, it is important to keep in mind that outside finance with a lower rate would not have the same effect; in fact, cheaper outside finance would be even more attractive. What matters is that the ex ante funding comes at the expense of ex post insurance. For parent-child relations, a more fitting description than “cheap finance” is perhaps “early bequest” and the aversion against family financing is to be seen as one against gambling with one’s bequest.

Absent charitable transfers, the altruism is irrelevant to A’s preference over financing. For example, if $qR - I > \pi_A^{\min}$, there are no charitable transfers, A consumes $qR - I$, and the expected selfish utility of investor i equals $u_i(W)$, irrespective of whom A sells the entire project to. Increasing altruism matters only insofar as it increases the range of outcomes under which charitable transfers occur; it is easy to see from (8) that a decrease in e increases π_A^{\min} . This relaxes the constraint $W - I < \pi_A^{\min}$, which plays a key role in Proposition 1.

Corollary 1. *Stronger altruism increases A’s preference for financing from O.*

By the way, note that Proposition 1 and Corollary 1 depend only on F’s altruism toward A, not

on A's altruism toward F. The emergency funds or early bequest effect is, in general, driven by the altruistic preferences of those who tend to be givers rather than receivers in the relationship. Thus, in this external financing model, the entrepreneur's aversion to family finance derives not from her own altruism, but from her counting on the altruism of her wealthy relative (or friend).

In what follows, we turn to the case with moral hazard, and focus on the parameter range that gives rise to a trade-off between family finance and outside finance:

Assumption 2. $W - I < \frac{\min}{A}$.

4.1.2 Family insurance vs. family incentives

When $B > 0$, we know from Lemma 1 that exclusive financing by O is not always feasible due to A's incentive-compatibility constraint. In such instances, A may resort to family finance provided that the altruism overcomes the moral hazard problem. It is clear that family finance cannot improve upon outside finance for $e \rightarrow 1$. It is also clear from (8) that F will donate her entire disposable wealth W to A for $e \rightarrow 1/2$, in which case there is no financing problem.

Lemma 3. *There exists $\underline{e} \in (1/2, 1)$ such that F finances A for free only if $e \leq \underline{e}$.*

That is, if the altruism is sufficiently strong, it trivially resolves the financing problem – though it remains true that A would rather finance the project through O if she could. When $e > \underline{e}$, F requires some repayment $R_F > 0$ and hence supplies financing only if A's incentive-compatibility constraint is satisfied under the financing contract. Let us first examine how R_F would depend on the altruism. Assuming incentive compatibility, F's break-even constraint for $I_F \in [I, W]$ is

$$q[eu_F(W - I_F + R_F) + (1 - e)u_A(I_F - I + R - R_F)] + (1 - q)[eu_F(0) + (1 - e)u_A(W - I)] = eu_F(W - \frac{\min}{A}) + (1 - e)u_A(\frac{\min}{F}) \quad (10)$$

Equation (10) defines R_F implicitly as a function of e .

Lemma 4. *If the project is financed by F, $R_F/e > 0$ for all $e > \underline{e}$.*

We know that, for $e = 1$, R_F converges to the repayment that O would require, that is, R_F would be set to let F break even *financially*. Lemma 4 hence says that, if A must resort to family finance, F is willing to provide A with financing at below-market rates, and that the discount increases in the degree of altruism. It is interesting to compare Lemma 4 with Corollary 1. When driven by altruism, family finance is cheaper precisely when it is, in principle, less attractive than outside finance.

For family finance to play a role for $e > \underline{e}$, however, we must show that it mitigates the moral hazard problem. To this end, it suffices to compare A's incentive-compatibility constraint under the two different types of financing. We derive these constraints in the Appendix (see proof to the next proposition). In doing so, since we assume that private benefits are unobservable, we must specify F's beliefs about A's terminal consumption in the event that the cash flow is 0.¹⁴ In Perfect

¹⁴One may argue that private benefit consumption, or deliberate actions that reduce expected repayment, may be visible to family members or friends. Here, we intentionally decide not to differentiate between F and O in terms of the information they have. That said, in Section Y, we consider a setup, in which observable deliberate non-repayment can damage the relationship between F and O.

Bayesian Equilibrium, provided that the project is financed, F must believe that A 's consumption in that event is 0. Also, our assumption that the private benefit is random simplifies the constraints. Specifically, we have assumed that, irrespective of whether A works or shirks, the project does not yield *any* payoff with probability $1 - q$. As a result, with probability $1 - q$, all players' utilities are independent of A 's action, and those conditional utilities can hence be omitted from the incentive compatibility constraints. We then rearrange terms to get the following: Let $\hat{l} = l_O = l_F \geq l$ and $\Delta_I \equiv \hat{l} - l$. Under outside finance, A works if and only if

$$e [u_A(\Delta_I + B + \pi_A^{\min}) - u_A(\Delta_I + R - R_O)] \leq (1 - e) \pi_A^{\min}. \quad (11)$$

In contrast, under family finance, the analogous condition is

$$e [u_A(\Delta_I + B + W - \hat{l}) - u_A(\Delta_I + R - R_F)] \leq (1 - e)(W - \hat{l} + R_F). \quad (12)$$

The terms on the left and on the right represent, respectively, A 's personal gain and F 's personal loss (as internalized by A) in the event that A shirks successfully (i.e., realizes the private benefit B). We claim that (12) is more lax than (11). This may be intuitive, but it is interesting to identify the various channels through which altruism operates:

- **Insurance.** Shirking confers more consumption on A under outside finance ($\Delta_I + B + \pi_A^{\min} > \Delta_I + B + W - \hat{l}$) since A gets a larger transfer from F ($\pi_A^{\min} > W - l \geq W - \hat{l}$).¹⁵ (This effect is absent if Assumption 2 is violated.)
- **Price.** Successful working confers less consumption on A under outside finance ($\Delta_I + R - R_O < \Delta_I + R - R_F$) since O requires a larger repayment ($R_O > R_F$).
- **Family impact.** Successful shirking imposes a smaller marginal loss on F under outside finance ($\pi_A^{\min} \leq W - \hat{l} + R_F$) since the default is vis-à-vis O in this case.
- **Weighting.** Due to altruism, A values her personal gain from shirking less ($e < 1$) and F 's personal loss more ($1 - e > 0$), which amplifies the above three effects.

Thus, family finance is sometimes feasible when outside finance is not. The converse is, however, also true. We already know from Proposition 1 that, conditional on incentive-compatibility, A 's expected utility is lower – and thus her participation constraint tighter – under family finance than under outside finance. This immediately implies not only that, for some projects, A requires outside finance but also that, once incentive compatibility is satisfied, she generally prefers to procure any additional capital from outsiders. We now summarize the above insights:

Proposition 2. *Suppose A and F exhibit standard altruistic preferences vis-à-vis each other.*

1. *For $W - l \geq \pi_A^{\min}$, there exist projects that are financed if and only if F is present. In the presence of both O and F , A may use some financing from F for incentive compatibility, but is otherwise indifferent as to who funds the project.*

¹⁵It is easy to show that (11) is tighter than the incentive-compatibility constraint underlying Lemma 1, where the terms with π_A^{\min} are absent (and the constraint reduces to $B \leq R - R_O$). This means that the presence of altruism between F and A exacerbates the moral hazard under financing from O . This is because an altruistic F provides A with undeserved insurance when there is no cash flow, thus making shirking more attractive. In other words, intra-family insurance makes “failure” – whether unfortunate or intentional – less costly.

2. For $W - I < \frac{\min}{A}$, there exist projects that are financed if and only if F is present and such that are financed if and only if O is present. In the presence of both O and F , A may use some financing from F for incentive compatibility, but otherwise prefers financing from O .

Both types of finance expand the financial frontier: family finance when incentives are the primary concern, and outside finance when risk (insurance) is the primary concern. This also leads to a “pecking order”: borrowers may *have to* turn to family finance first due to incentive reasons, but they actually prefer outside finance and consider family finance a last resort. Furthermore, not only do the two sources of financing co-exist but they are sometimes even complementary. Family co-financing (or co-signing) may be a prerequisite for outside finance, and at the same time the borrower may be unwilling to undertake the risky investment with only family funds. Interestingly, all of the above effects are driven by the single assumption of standard altruism.

4.2 Financing with paternalistic altruism (Model 2)

Standard altruistic preferences create an aversion to family finance only when the choice of finance affects the scope for charity (induced by the altruism). This section examines a variant of altruistic preferences that works through a different mechanism:

$$U_i = u_i[e_i \tilde{u}_i + (1 - e_i) \tilde{u}_j] \quad \text{for } i \neq j \quad (13)$$

where $e_i \in (1/2, 1]$ again reflects the degree of egoism i exhibits vis-à-vis j . The difference to before is that, here, i internalizes j 's material payoff rather than j 's utility. This gives rise to a form of disagreement that is absent under standard altruism: Let $\tilde{u}_i = \tilde{u}_i$ and $\tilde{u}_j \in \{\tilde{u}_1, \tilde{u}_2\}$. Under preferences of the form (1), that is, under standard altruism, i and j have the same preferences over the two lotteries \tilde{u}_1 and \tilde{u}_2 (abstracting from charitable transfers):

$$\begin{aligned} e_i u_i(\tilde{u}_i) + (1 - e_i) E[u_j(\tilde{u}_1)] &\geq e_i u_i(\tilde{u}_i) + (1 - e_i) E[u_j(\tilde{u}_2)] \\ \Leftrightarrow \\ (1 - e_j) u_i(\tilde{u}_i) + e_j E[u_j(\tilde{u}_1)] &\geq (1 - e_j) u_i(\tilde{u}_i) + e_j E[u_j(\tilde{u}_2)] \\ \Leftrightarrow \\ E[u_j(\tilde{u}_1)] &\geq E[u_j(\tilde{u}_2)] \end{aligned}$$

for all $e_i, e_j, u_i, u_j, \tilde{u}_i$, and \tilde{u}_j . That is, any choice i makes for the sake of j is the same choice j would make. By contrast, under preferences of the form (13),

$$\begin{aligned} E\{u_i[e_i \tilde{u}_i + (1 - e_i) \tilde{u}_1]\} &\geq E\{u_i[e_i \tilde{u}_i + (1 - e_i) \tilde{u}_2]\} \\ \Leftrightarrow \\ E\{u_j[(1 - e_j) \tilde{u}_i + e_j \tilde{u}_1]\} &\geq E\{u_j[(1 - e_j) \tilde{u}_i + e_j \tilde{u}_2]\}. \end{aligned}$$

These preferences allow for “paternalism”: i may make choices for the sake of j that j would not choose for herself. This also implies that i may be willing to grant j money only for certain purposes; under non-paternalistic altruism, i wants j to spend the money on whatever j wants to spend it on (so long as no material harm is done to i). Jacobsson et al. (2007) provide experimental evidence for paternalistic preferences.¹⁶

¹⁶In their experiments, subjects can donate money or nicotine patches to a smoking diabetes patient. In one experiment, one group can donate only money and another group only patches. It turns out that average donations

We assume that A and F exhibit symmetric paternalistic preferences vis-à-vis each other: $U_A(e_A, F) = u_A[e_A + (1-e)F]$ and $U_F(F, A) = e_F + (1-e)A$. Note that $U_i/\partial_i \geq U_j/\partial_j$ for $e \geq 1/2$. Hence, ex post charitable transfers will not take place, which rules out the “emergency funds” effect studied in the previous section.

4.2.1 First best choice

As before, we first examine which financing source A prefers in the absence of moral hazard. For any amount $\hat{l} \geq l$ of exclusive financing, O’s break-even constraint is

$$R_O = \hat{l}/q. \quad (14)$$

Given that A can opt for funding from O, F’s break-even constraint for exclusive financing is

$$\begin{aligned} q[e(W - \hat{l} + R_F) + (1-e)(\Delta_I + R - R_F)] + (1-q)[e(W - \hat{l}) + (1-e)\Delta_I] \\ = q[eW + (1-e)(\Delta_I + R - R_O)] + (1-q)[eW + (1-e)\Delta_I] \end{aligned} \quad (15)$$

where $\Delta_I \equiv \hat{l} - l$. Together, (14) and (15) pin down unique values for R_O and R_F . It is straightforward to verify that the solution is $R_F = R_O$ by plugging it into (15). The intuition for this result is the same as for Lemma 2.

Let us now compare A’s expected utility under outside finance and family finance. Define $e_A \equiv e_A + (1-e)F$ as A’s “paternalistic” payoff. It is optimal for A to transfer the entire cash flow risk to the investor. Under outside finance, her expected paternalistic utility is therefore

$$E[u_A(e_A)] = qu_A[e(\Delta_I + R - R_O) + (1-e)W] + (1-q)u_A[e\Delta_I + (1-e)W]. \quad (16)$$

Under family finance, it is

$$\begin{aligned} E[u_A(e_A)] = qu_A[e(\Delta_I + R - R_F) + (1-e)(W - \hat{l} + R_F)] + \\ (1-q)u_A[e\Delta_I + (1-e)(W - \hat{l})]. \end{aligned} \quad (17)$$

Given $R_F = R_O$, the expected paternalistic payoff $E(e_A)$ is the same in both cases. The distribution of e_A in (17), having a larger variance, is thus a mean-preserving spread of its distribution in (16). This is because A partly internalizes F , which is more volatile under family finance, and it implies that (16) is larger than (17).

Proposition 3. *Suppose $B = 0$. Then, $R_F(\hat{l}) = R_O(\hat{l})$, but A strictly prefers financing from O. The optimal contract is $R_O = R$ and $l_O = qR$.*

A experiences direct disutility from imposing risk on F, that is, she is *worried* about F. She experiences no such disutility from imposing risk on O, whom she is indifferent towards. Crucially, A’s paternalistic disutility from risking F’s wealth is not offset by her paternalistic utility from repaying F. For A, family finance is thus an imperfect risk transfer.

are 40% greater in the nicotine patches group. Moreover, when subjects can donate both nicotine patches and money, more than 90% of the donations are given in kind rather than cash. Under non-paternalistic preferences, subjects should prefer donating money.

4.2.2 Social risk aversion vs. social incentives

Again, in the presence of moral hazard, exclusive financing from O can be infeasible. In this case, financing from F may be indispensable for implementing the project, so that F's break-even constraint changes to

$$q[e(W - I_F + R_F) + (1 - e)(\Delta_I + R - R_F)] + (1 - q)[e(W - I_F) + (1 - e)\Delta_I] = eW.$$

Solving for R_F yields

$$R_F = \frac{I_F}{q} - \frac{1 - e}{2e - 1} (R - I/q), \quad (18)$$

which is positive (only) for $e > \frac{qR - I + I_F}{qR - I + 2I_F} \equiv \underline{e}$.

Lemma 5. *If the project is financed by F, $R_F = 0$ for $e \leq \underline{e}$ and $R_F / e > 0$ otherwise.*

Again, once indispensable, F is willing to provide financing at rates below financial break even. The required repayment decreases with altruism, and if sufficiently altruistic, F simply gives A a cash gift to start the project.

Whenever $R_F > 0$, F finances the project if and only if A would work under family finance but shirk under outside finance; A is otherwise denied family finance or prefers outside finance. Under outside finance, A's incentive-compatibility constraint is

$$qu_A[e(\Delta_I + B) + ($$

The empirical predictions here are the same as in the second case of Proposition 2: (i) family financing is provided at below market rates but is nonetheless a last resort; (ii) certain projects require family finance for incentive reasons; (iii) certain risky projects will not be undertaken with (only) family funds. Propositions 2 and 4 represent “social” variants of the classic trade-off between risk sharing and incentive provision. In both cases, family finance is superior in terms of incentives but inferior in terms of risk allocation. The main difference is that, under standard altruism, the risk allocation effect operates through a material channel, the “emergency funds” effect, and implies that A dislikes family finance for ultimately selfish reasons. By contrast, under paternalism, the risk allocation effect works through a purely emotional channel, which we call “social risk aversion,” namely that A does not wish to expose F to risk out of genuine concern. This leads to a testable difference: the emergency funds effect increases with F ’s concern for A , whereas social risk aversion increases with A ’s concern for F . Furthermore, it is only under paternalistic preferences that a situation can arise in which A is unwilling to impose a risk on F that F is willing to accept.

Again, the optimal contract taps both financing sources for the right balance between incentives and risk sharing. Keen on shedding risk, A wants to raise funding only from O but might be unable to do so due to moral hazard. She must then raise some funding through F to preserve her incentives but, conditional thereupon, sells as much cash flow as possible to O . This “co-signing” effect of family finance is reflected in the following corollary.

Corollary 2. *If the project is co-financed, l_O decreases with e .*

It may seem counterintuitive that closer ties to F make A raise more financing from O . But this is consistent with the logic of co-signing: The closer A and F , the stronger is the incentive effect per unit of financing from F . As a result, less financing from F is needed to obtain co-financing from O . Intuitively, co-signing is more effective when the borrower and the co-signer are more closely related.¹⁷

4.3 Financing as gift exchange (Model 3)

In this section, we dispense with risk aversion to mute the mechanisms studied above. That is, A is now, like F and O , risk neutral.

Instead, we want to model family finance as a gift exchange (Akerlof, 1982). Akerlof proposed that workers who are paid above market wages reciprocate the “gift” by working harder, because they develop positive sentiment or adhere to a reciprocity norm. Here, we translate this idea to financing:

- A

To model “extraordinary effort,” we introduce a new stage in which A can pay F “favors.” A chooses the value g of her favors to F at a cost of cg to herself, where $c \geq 1$. When $c > 1$, favors are costly insofar as A would rather repay F in cash than default and pay *commensurate* favors. The gift exchange norm is that, if F gives A a below market rate loan, A should repay F in any case, whether in cash or in favors ($g \geq R_F$). We explicitly model the consequences of norm violations as changes in altruistic sentiment. A and F exhibit reciprocal altruism (Levine, 1998) of the form

$$U_i = u_i + \frac{a_i + a_j}{1 +} u_j \quad \text{for } i \neq j$$

where $a_i, a_j \in [-1, 1]$ and $\alpha \in [0, 1]$. Under this formulation, social feelings are *reciprocal*: how much i cares about j depends on how much j cares about i .¹⁸ While altruism types are fixed in Levine (1998), we assume that $a_A, a_F = \bar{\alpha} > 0$ initially but that, if A violates the gift exchange norm vis-à-vis F , a_F decreases to $\underline{\alpha} = 0$.¹⁹

The purpose of this analysis is not to show that informal financial relations can be sustained (or modelled) as a gift exchange. Rather, it is to see whether such a financing arrangement naturally exhibits below market financial returns as well as shadow costs.

4.3.1 First best choice

Setting $B = 0$, we compare an informal gift exchange between A and F to a formal loan between A and O . A gift exchange can be sustained only if, for a given “required” favor R_F , A is willing to accept the favor, which requires

$$(c - \bar{\alpha})R_F \leq \bar{\alpha} \frac{1}{1 +} (W - I). \quad (19)$$

The left-hand side is A ’s *net* cost of paying the favor, which is smaller than cR_F , because she partly internalizes F ’s utility from receiving it. The right-hand side is the altruistic utility A would lose if she denied F the favor, that is, if she violated the norm. We refer to this as ‘social collateral’ (in reference to a similar assumption in Karlan et al. (2010)). The value of the social collateral increases with the primitive altruism parameter $\bar{\alpha}$ and the reciprocity parameter α .

A successful gift exchange further requires that F is willing to accept the favor from A , which requires $R_F \geq \bar{\alpha}cR_F$, where the right-hand side reflects F ’s altruistic disutility from internalizing that the favor is costly to A . We henceforth assume

$$\bar{\alpha}c < 1, \quad (20)$$

which ensures that F would accept the favor.

Note that, if (19) holds, A is also willing to repay R_F in cash if the project succeeds (since $c \geq 1$). Thus, in a successful gift exchange, F receives R_F regardless of the project outcome. Given

¹⁸Levine (1998) presents experimental evidence consistent with the view that whether subjects behave altruistically or spitefully depends on their beliefs about the altruism or spitefulness of others.

¹⁹Arbak and Kranich (2007), Ellingsen and Johannesson (2008), and Dur (2008) model gift exchange as the outcome of games in which players with reciprocal altruism seek to signal their altruism types by being generous. In those models, altruism types are fixed. Here, altruism is not only reciprocal but altruism types may also change as a result of behavior. This has the effect that the altruistic relationship plays a role similar to what Karlan et al. (2009) refer to as social collateral.

that A can obtain financing from O, F's break-even constraint in that case is

$$q[W - I + R_F + \bar{\alpha}(R - R_F)] + (1 - q)[W - I + R_F - \bar{\alpha}cR_F] = q[W + \bar{\alpha}(R - I/q)] + (1 - q)W,$$

which we rearrange to express R_F as a function of c :

$$R_F(c) = \frac{1 - \bar{\alpha}}{1 - \bar{\alpha}[q + (1 - q)c]} I. \quad (21)$$

The next result describes this function.

Lemma 6. *Suppose (19) and (20) hold. Then $R_F(c) < R_O$, $R_F(1) = I$, and $R'_F(\cdot) > 0$.*

If (19) is violated for $R_F = R_F(c)$, F does not finance the project, since he would lose both money and a friend. If both (19) and (20) hold for $R_F = R_F(c)$, gift exchange is feasible: A would always repay F, in cash if the project succeeds and in favors otherwise. For $c = 1$, paying in favors creates no additional costs; it is as if A always repays in cash, and hence $R_F(1) = I$. $R_F(1) < R_O$ because A de facto never defaults in the gift exchange. In fact, $R_O - R_F(1) > 0$ equals the default premium under outside finance. For $c > 1$, paying favors is costlier than paying cash. This affects not only A but also F who, while wishing to be repaid, dislikes the “hassle” A must undergo to achieve that. The hassle required to even the balances (or the potential damage to their relationship) represents a (potential) deadweight loss, which we refer to as “social tension.” $R'_F(\cdot) > 0$ reflects that social tension is higher when c is larger. $R_F(c) < R_O$ remains true, however, despite the social tension for all c that satisfy (20), that is, all c for which F is still willing to accept the favor (see proof).

Does A prefer the gift exchange to outside finance? Her utility under outside finance is $qR - I + \bar{\alpha}W$. She prefers the gift exchange if and only if

$$q[R - R_F + \bar{\alpha}(W - I + R_F)] + (1 - q)[\bar{\alpha}(W - I + R_F) - cR_F] \geq qR - I + \bar{\alpha}W. \quad (22)$$

It can be shown that this is violated for all $c > 1$.

Proposition 5. *Suppose $B = 0$. Suppose (19) and (20) hold. If $c = 1$, then $R_O > R_F = I$ and A is indifferent between the two sources of finance. If $c > 1$, then $R_O > R_F > I$, and A strictly prefers financing from O and chooses $I_O = qR$ and $R_O = R$.*

To an outside observer who does not see subsequent favors, it might seem as if A is willing to finance F at negative returns. But this is a misperception because the “cheap” family loan is persistent insofar as F expects to be “repaid” by other means even after a “default.” Thus, whenever dealing with family debt through such means is less attractive than settling it in cash, family finance is less attractive. In other words, while seemingly cheap, it has a shadow cost.

4.3.2 Social tension vs. social incentives

When $B > 0$, outside finance is feasible only when A's incentive-compatibility constraint

$$q(R - R_O + \bar{\alpha}W) + (1 - q)\bar{\alpha}W \geq q(B + \bar{\alpha}W) + (1 - q)\bar{\alpha}W,$$

which reduces to $R \geq R_O + B$, is satisfied. Under family finance, the constraint is

$$q[R - R_F + \bar{a}(W - I + R_F)] + (1 - q)[\bar{a}(W - I + R_F) - cR_F] \geq \\ q[B - cR_F + \bar{a}(W - I + R_F)] + (1 - q)[\bar{a}(W - I + R_F) - cR_F],$$

which reduces to $R \geq B - (c - 1)R_F$. This is more lax than $R \geq I/q + B$ for two reasons:

- **Unlimited liability.** The gift exchange norm de facto eliminates limited liability, without which there is no moral hazard. To see this, note that the constraint under family finance would reduce to the first-best constraint $R \geq B$ for $c = 1$.
- **Social tension.** When $c > 1$, the constraint is even more lax than the first-best constraint $R \geq B$. That is, A's incentives to shirk are even weaker because she wants to avoid a situation in which she must reciprocate through costly favors.

Note that the unlimited liability effect washes out any price effect ($R_F < R_O$) or weighting effect ($\bar{a} > 0$). Here, the only incentive role of (the reciprocal) altruism is to provide social collateral to enforce the gift exchange, which in turn eliminates limited liability.

This creates again the trade-off that family finance is superior in terms of incentives but, given incentive compatibility, more costly.

Proposition 6. *Suppose A and F can enter an informal gift exchange.*

1. *For $c = 1$, there exist projects that are financed if and only if F is present. In the presence of both O and F, A may use some financing from F for incentive compatibility, but is otherwise indifferent as to who funds the project.*
2. *For $c > 1$, there exist projects that are financed if and only if F is present and such that are financed if and only if O is present. In the presence of both O and F, A may use some financing from F for incentive compatibility, but otherwise prefers financing from O.*

The second case is a “social” version of the trade-off between ex ante and ex post efficiency often seen in incomplete contract models of financial contracting (e.g., Bolton and Scharfstein, 1990). Family finance improves ex ante commitment at the risk of ex post frictions; in fact, the frictions engender the commitment. The optimal contract uses just enough family finance to establish the right incentives with minimal social tensions. Here the shadow cost derives not from A's concern about intra-family transfers or F's well-being but from her concern about preserving the relationship and avoiding tensions.

It should be noted that the gift exchange is sustained by the threat of a decrease in mutual sentiment, which is ex post inefficient. This begs the question of “renegotiability,” or why the parties would not suppress such negative sentiments after the fact. We discuss this issue in Section 6.4.

5 Extensions

In this section, we discuss some simple extensions of the above models that have distinct and practically relevant implications.

5.1 Size constraints

Suppose A can choose the size $l \in (0, \infty)$ of her project, with a project of size l yielding the expected cash flow $qR(l)$. We make the following assumption about technology.

A3. $qR'(l) > 1$ and $\lim_{l \rightarrow \infty} qR'(l) = 1$.

This assumption says that returns to scale are positive (but not necessarily increasing) but that the marginal return becomes negligible at very large sizes.

To ensure that the agency problem does not disappear with project size, we assume that A 's private benefits, $B(l)$, also increase with project size. Specifically, we assume:

A4. $q \left[R(l) - \frac{l}{q} \right] < qB(l)$ for all $l \in (0, \infty)$.

This assumption effectively says that, irrespective of project size, O cannot fund a project without some means of disciplining A . (Projects that are not subject to **A4** would not be capital-constrained.)

Unlike before, we assume that O possesses a costly monitoring technology she can use to reduce private benefit consumption. For simplicity, we assume that he can eradicate A 's private benefits at cost $M(l) = \bar{m} + m(l)$, where \bar{m} is a fixed cost (per borrower). F has no access to this monitoring technology and relies solely on social incentives to mitigate the agency problem.²⁰ So, we assume that formal finance is information-driven but informal finance, for lack of monitoring, by some form of "trust."

5.1.1 Outside finance with monitoring

With financing from O , A 's participation constraint is always satisfied due to limited liability. Moreover, O 's monitoring technology ensures incentive compatibility. This leaves F 's break-even constraint as a possible source of size constraints, $qR_O - M(l) \geq l$, which yields

$$R_O(l) \geq \frac{l + \bar{m} + m(l)}{q}.$$

Feasibility requires $R(l) \geq R_O(l)$, which yields

$$qR(l) - l - m(l) \geq \bar{m}.$$

Unsurprisingly, covering the fixed cost requires a minimum project size. Depending on the specific form of $R(l)$ and $m(l)$, the condition may also imply a maximum project size. However, this is not the case if the monitoring technology exhibits sufficient economies of scale (e.g., $m'(l) < qR'(l)$ for all l).

5.1.2 Standard altruism

In the model with standard altruism, if A values intra-family insurance sufficiently much, she prefers not to use F 's entire disposable wealth to invest in the project. To see this, suppose A maximizes

²⁰Note that our endowing the formal lender with an informational advantage over the informal lender is diametrically opposite to what many existing models of informal finance assume.

her expected utility with respect to project size:

$$\max_{I \in (0, W)} q[eu_A(R(I) - R_F(I)) + (1 - e)u_F(W - I + R_F(I))] + (1 - q)[eu_A(W - I) + (1 - e)u_F(0)].$$

Differentiating with respect to I yields

$$q[eu'_A(R(I) - R_F(I))(R'(I) - R'_F(I)) + (1 - e)u_F(W - I + R_F(I))(R'_F(I) - 1)] - (1 - q)eu'_A(W - I).$$

The last term increases in I since $u''_A < 0$, and the solution to the maximization problem is interior since $u'_A(0) = \infty$, irrespective of $R_F(I)$. (In the Appendix, we show a similar effect in the model with paternalism.) Additional size constraints may come from A 's incentive compatibility constraint.²¹

5.1.3 Gift exchange

Unless F is willing to donate money to A , an informal gift exchange requires that (19) holds, which in this setting is

$$(c - \bar{\alpha})R_F(I) \leq \bar{\alpha} \frac{1}{1 + \bar{\alpha}}(W - I).$$

Since, by (21), $R'_F(I) \geq 0$, the LHS is increasing in I , whereas the RHS is decreasing in I . For sufficiently large I , (19) is thus violated for some $I < W$. (It is worth noting that (19) would impose some upper bound on project size even if its RHS were independent of I .)

Moreover, A may want to limit the project size even when (19) holds. Using (21) to substitute for R_F in A 's expected utility in a gift exchange, we can derive A 's choice of project size as the solution to

$$\max_{I \in [0, W]} qR(I) + \bar{\alpha}W - [\bar{\alpha}(1 - \beta) + q\beta + (1 - q)c]I \quad (23)$$

where

$$\equiv \frac{1 - \bar{\alpha}}{1 - \bar{\alpha}[q + (1 - q)c]} > 1.$$

The derivative of (23) with respect to I is non-negative if

$$qR'(I) \geq \bar{\alpha}(1 - \beta) + q\beta + (1 - q)c,$$

which is stricter than **A3** if the RHS exceeds 1. This is possible since $c, \beta > 1$, and true, for example, when $\bar{\alpha} = 1$. In such cases, since $\lim_{I \rightarrow \infty} qR'(I) = 1$, the inequality could impose an upper bound on project size below W , that is, impose a size limit independent of F 's disposable wealth.

We summarize the previous three subsections in the following proposition.

Proposition 7. *If based on a monitoring technology with some per-borrower fixed costs, financing from O puts a lower bound $\underline{I} > 0$ on project size. If A and F exhibit altruistic preferences vis-à-vis each other and $u_A(\cdot)$ satisfies the Inada conditions, or if A and F enter a gift exchange, financing from F puts an upper bound $\bar{I} < W$ on project size.*

²¹It is simple to verify, for example, that the incentive compatibility constraint would similarly impose an upper bound on project size if the private benefits were certain.

This result is intuitive. An information-based lending technology requires a minimum loan size if the acquisition of information imposes some fixed cost per borrower; a loan that is too small cannot recoup the fixed cost. The altruism-based lending technology has the shadow cost that larger loans lead to smaller charitable transfers in those states of the world in which the borrower's marginal value of consumption is the highest. This trade-off between investment and insurance leads the entrepreneur to choose investments that are smaller than what is possible to finance. (In the case of paternalistic altruism, the intuition is that the borrower optimizes a “portfolio” of social payoffs and does not want to put everything in the “risky asset.”) The gift exchange technology limits project size for two reasons. First, with larger loans raising the financial stakes, the temptation to prioritize financial gains over the relationship is higher, which can frustrate the exchange. Second, even if the gift exchange is entered, the borrower may want to limit investment to reduce social tensions in the event of default, which loom larger, the larger the loan.

5.2 Risk choice

In the above models, project risk is determined ex ante. In this section, we analyze how the investor's identity affects the entrepreneur's choice of risk ex post. We abstract from private benefit consumption and monitoring, and instead assume that A chooses between two projects (requiring the same outlay I) and her choice is unobservable. One project yields the certain cash flow $\bar{R} > I$. The other project yields R with probability $q < 1$ and 0 otherwise. The risky project has a higher expected return, so

$$q > \bar{R}/R. \quad (24)$$

That is, neither project is dominated. But in the presence of a risk-neutral investor, the first-best outcome is to invest in the risky project.

5.2.1 Standard altruism

We begin with standard altruism. The benchmark outcome is outside finance. Given a required repayment $R_O \in [0, R]$, A takes the risky project if and only if

$$e[qu_A(R - R_O) + (1 - q)u_A(0)] + (1 - e)u_F(W) \geq eu_A((\bar{R} - R_O)^+) + (1 - e)u_F(W)$$

which reduces to

$$q \geq \frac{u_A((\bar{R} - R_O)^+)}{u_A(R - R_O)} \equiv \hat{q}(R_O). \quad (25)$$

Note that we assume the case without charitable transfers; A 's consumption is zero when the project fails. We comment on the case with charitable transfers further below.

Comparing the inequalities (25) and (24), we see that whether A takes on too much or too little risk relative to first best depends on $\hat{q}(R_O)$.

Lemma 7. $\hat{q}'(R_O) < 0 \forall R_O \in [0, \bar{R})$, $\hat{q}(R_O) = 0 \forall R_O \geq \bar{R}$, and $\hat{q}(0) > \bar{R}/R$.

In words, A is more inclined to choose the risky project when R_O is larger. Moreover, A is excessively risk-seeking for sufficiently high R_O but too conservative for sufficiently low R_O . This reflects two countervailing forces: risk shifting and risk aversion. For high R_O , O bears most of the downside risk, so A 's risk shifting incentives prevail. For low R_O , A bears most of the downside risk, so her risk aversion dominates.

Now consider family finance. Given $R_F \in [0, R]$, A chooses the risky project if and only if

$$e[qu_A(R - R_F) + (1 - q)u_A(0)] + (1 - e)[qu_F(W - I + R_F) + (1 - q)u_F(W - I)] \geq u_A((\bar{R} - R_F)^+) + (1 - e)u_F(W - I + \min(\bar{R}, R_F)),$$

which can be written

$$qu_A(R - R_F) + \frac{1 - e}{e}\Delta_{alt} \geq u_A((\bar{R} - R_F)^+) \quad (26)$$

where

$$\Delta_{alt} \equiv qu_F(W - I + R_F) + (1 - q)u_F(W - I) - u_F(W - I + \min(\bar{R}, R_F)).$$

Proposition 8. *Suppose A and F exhibit altruistic preferences vis-à-vis each other. A is less likely to take the risky project with financing from F than with financing from O. A can be too conservative taking the safe project even if $q > \bar{R}/R$.*

Family finance makes A more conservative. First, $R_F < R_O$ both because of altruism (which reduces F's required return) and because A tends to be more conservative (which reduces the default premium). Ignoring Δ_{Alt} for now, this makes A less likely to take the risky project because she retains more downside risk (Lemma 7). Second, Δ_{Alt} captures the altruistic disutility A experiences from reducing F expected consumption by taking the riskier project. As shown in the proof, this channel is effective only when $R_F < \bar{R}$, that is, when switching to the risky project decreases the expected repayment to F due to default risk – in which case, $\Delta_{Alt} < 0$.

We will not endogenize R_A and R_F here, because the trivially optimal contract is to sell the entire project to either investor. The purpose of studying A's risk choice for given financing terms is to argue that family-financed entrepreneurs pursue a more conservative investment policy because of their financing source. While such conservatism can prevent excessive risk taking, it can in general also deter efficient risk taking, as in our model.

Intra-family insurance complicates matters a little. As shown in the Appendix, charitable transfers produce a third effect, which reinforces Proposition 8 if the entrepreneur is “ordinarily” self-sufficient. Indeed, if the safe project yields enough for the entrepreneur not to receive charity, the third effect also leads to less risk taking under family finance than under outside finance. In this case, charity provides insurance against the failure of the risky project. This increases the entrepreneur's willingness to take risks under either type of finance, but the effect is weaker, the less ‘emergency funds’ are available. Family finance (unlike outside finance) reduces these funds. In contrast, if the entrepreneur receives charitable transfers even under the safe project – i.e., she is generally dependent on charity from her family – the third effect can work in the opposite direction. In this case, it can happen that under family finance the allocation is the same whether the risky project fails or the safe project is undertaken, while under outside finance a failed risky project induces larger transfers than the safe project. If so, with the entrepreneur's payoff fixed in the event of insurance, the safe project may be preferred under outside finance, where it lowers the family burden, though not under family finance. As noted, this can occur only when the entrepreneur “lives off” family support. In general, family finance discourages risk taking which is, as shown in the Appendix, also true in the model with paternalistic preferences, where social risk aversion provides yet another reason for conservatism under family finance.

5.2.2 Gift exchange

We now turn to the gift exchange model. Under outside finance, given $R_O \in [0, R]$, A chooses the risky project if and only if

$$q[R - R_O + \bar{a}W] + (1 - q)(\bar{a}W) \geq (\bar{R} - R_O)^+ + \bar{a}W,$$

which simplifies to

$$q \geq \frac{(\bar{R} - R_O)^+}{R - R_O} \equiv \hat{q}(R_O).$$

Note that simply $\hat{q}(R_O) = \hat{q}(R_O)$, as defined in (25), for $u_A(\cdot) = \cdot$. Thus, by Lemma 7, outside finance increases risk taking incentives.

Under family finance, we must specify whether A would be willing to pay favors, i.e., whether the gift exchange constraint (19) holds. Let us first assume that this is the case. Moreover, suppose $\bar{R} > R_F$, so there is no default under the safe project (we discuss the alternative case further below), and $c > 1$ such that favors are costly. Then, A chooses the risky project if and only if

$$q[R - R_F + \bar{a}(W - I + R_F)] + (1 - q)[\bar{a}(W - I + R_F) - cR_F] \geq \bar{R} - R_F + \bar{a}(W - I + R_F),$$

which simplifies to

$$q \geq \frac{\bar{R} + (c - 1)R_F}{R + (c - 1)R_F}.$$

It is straightforward to show that the RHS is greater than \bar{R}/R and increasing in c . Thus, family finance leads to excessive conservatism; the more so, the costlier the favors.

Now suppose (19) does not hold, so A would not pay F any favors. We assume that she does pay F from project cash flows, due to a formal contract or because (19) would hold for $c = 1$ (though not for $c > 1$). In this case, a failure of the risky project ends up reducing F's primitive altruism parameter from \bar{a} to 0, and hence A's effective altruism from \bar{a} to $\bar{a}/(1 + \lambda)$. A chooses the risky project if and only if

$$q[R - R_F + \bar{a}(W - I + R_F)] + (1 - q)\frac{\bar{a}}{1 + \lambda}(W - I) \geq \bar{R} - R_F + \bar{a}(W - I + R_F),$$

which simplifies to

$$q \geq \frac{\bar{R} + \Delta_{\text{gex}}}{R + \Delta_{\text{gex}}}$$

where

$$\Delta_{\text{gex}} \equiv \bar{a} \left[R_F + \frac{1}{1 + \lambda}(W - I) \right] - R_F.$$

A is excessively conservative for $\Delta_{\text{gex}} > 0$. This is more likely, the larger \bar{a} and λ , that is, the larger the impact (of A denying favors) on F's primitive altruism and the higher the degree of reciprocity in altruism. Moreover, it is possible as $\lim_{\bar{a}, \lambda \rightarrow 1} \Delta_{\text{gex}} = 1/2(W - I)$. Thus, family finance can lead to excessive conservatism regardless of whether (19) holds, because either way – paying favors or harming the relationship – default is socially costly.

Now suppose $\bar{R} < R_F$. In this case, $\hat{\pi}(R_O) = 0$, so A always takes the risky project under outside finance regardless of q , since she would gain nothing from the safe project. While it follows immediately that A is weakly more conservative under family finance, it can further be shown that A may be excessively conservative in this case as well (see proof of the next proposition). The reason is as follows: The safe project entails default. With the risky project, default is not certain, but the potential shortfall is larger. Opting for the risky project amounts to buying state-contingent cash by paying state-contingent favors; that is, taking the safe project amounts to “saving” on favors by paying in “cash.” That the marginal cost of favors exceeds the marginal value of cash then tilts incentives towards the safe project. Intuitively, the deadweight loss associated with social tensions raises the appeal of actions that decrease “social debt,” in particular relative to actions that may increase social debt for a potential monetary gain.

Proposition 9. *Suppose A and F initiated a gift exchange. If $c > 1$, A is less likely to take the risky project with financing from F than with financing from O. With financing from F, she may be too conservative taking the safe project even if $q > \bar{R}/R$.*

5.3 Formal contracts protect social relations

In an informal gift exchange, repayment is governed by a social collateral constraint such as (19). If the constraint is violated, F and A may not enter a gift exchange (ex ante) or may suffer damage to their relationship (ex post). In the absence of third-party enforcement, not only favors but also cash payments must be socially incentivized. Given required repayment R_F and project cash flow of R , A voluntarily repays F if and only if

$$(1 - \bar{\alpha}) \min\{R_F, \tilde{R}\} + (c - \bar{\alpha}) \max\{R_F - \tilde{R}, 0\} \leq \bar{\alpha} \frac{1}{1 + c} (W - I) \quad (27)$$

When paying favors is costlier than paying cash ($c > 1$), this constraint is more likely satisfied by higher \tilde{R} . For low \tilde{R} , A may find it so costly to satisfy F that she exercises the option of abandoning the relationship, the disutility from which is bounded by the value of the relationship, in which case she may as well walk away with the cash.

Now suppose A’s project, if undertaken, yields R^h with probability q and $R^l < R^h$ otherwise, such that (27) holds for $\tilde{R} = R^h$ but not for $\tilde{R} = R^l$, and let us distinguish between two different scenarios, in which the effective altruism between A and F starts out at the same level but in only one of which the altruism is reciprocal:

Case 1. $\alpha = 0$ and $\bar{\alpha} > 0$. In this case, $U_F = u_F + \bar{\alpha}u_A$ irrespective of whether A repays F. F’s participation constraint is hence

$$q[W - I + R_F + \bar{\alpha}(R^h - R_F)] + (1 - q)[W - I + \bar{\alpha}R^l] \geq W,$$

which can be written as

$$R_F \geq \frac{I - \bar{\alpha}[qR^h + (1 - q)R^l]}{q(1 - \bar{\alpha})}.$$

This is feasible only if the right-hand side does not exceed R^h , which gives

$$qR^h + \bar{\alpha}(1 - q)R^l \geq I. \quad (28)$$

Note that this is stricter than the first-best rule $qR^h + (1 - q)R^l \geq I$ for $\bar{\alpha} < 1$.

Case 2. $\alpha = 1$ and $\bar{\alpha} > 0$. In this case, $U_F = u_F + \bar{\alpha}u_A$ if A repays F but $U_F = u_F + \frac{\bar{\alpha}}{2}u_A$ otherwise. F's participation constraint is then

$$q[W - I + R_F + \bar{\alpha}(R^h - R_F)] + (1 - q)[W - I + \bar{\alpha}/2 R^l] \geq W.$$

Following the same steps as in the previous case, one can show that this is feasible only if

$$qR^h + \bar{\alpha}/2(1 - q)R^l \geq I.$$

This is stricter than (28). The two left-hand sides differ by $\bar{\alpha}/2(1 - q)R^l$, which is the utility loss that F suffers from damage to the relationship if A refuses to reciprocate F's gift.

So, there exist parameters such that F would participate in the case with unconditional altruism but not in the case with reciprocal altruism. For such parameters, introducing formal contracts, whereby repayment is enforced by third parties, has no impact on F's participation in the first case but may be pivotal for his participation in the second case, although the impact on F's expected cash flow is the same in both cases. In the second case, F's marginal gain from formal contracting is larger because it also prevents the possible decrease in reciprocal altruism. In other words, part of the value of formal contracts is to protect the relationship.

6 Discussion

6.1 Empirical implications

In this section, we speculate about empirical tests that could help distinguish our theory from other theories of informal finance. The first prediction is negative required returns. There is broad-brush evidence on interest-free family loans. In some jurisdictions, a more appropriate prediction may be that formal family loans bunch at minimum interest rates that exempt them from gift taxes. Systematic data on the pricing of family loans would provide a basic test of our theories.

A more difficult task is to show that, despite low required returns, borrowers prefer to raise formal finance. One way to test this hypothesis is to verify whether entrepreneurs that start out with family finance later – once they are able to – use high-interest formal loans to *settle*, rather than add to, low-interest family loans. Another test would be to identify an exogenous shock to the availability of formal finance and to examine how it affects the use of family finance. For example, Sweden passed a law in 2010 limiting mortgages to at most 85 percent of a home's market value. The Association of Swedish Real Estate Agents reports that homebuyers finance the remaining 15 percent primarily through loans from their families (*The Local*, 2011). An increase in family loans at *below market* interest rates following the law would imply that homebuyers did not exhaust this “cheaper” source of finance in the absence of the law.

Another prediction of our theories is that social ties between borrowers and lenders inhibit risk taking, both *ex ante* and *ex post*. An online experiment by Andersson et al. (2012) shows that variation in social preferences affects the proclivity to take risk on behalf of others. One could use a similar approach in other contexts. Imagine, for example, a microfinance field experiment in which (i) prospective borrowers are offered an individual-liability loan, (ii) some of them, randomly chosen, are offered better terms provided that they can procure an eligible co-signer, and (iii) some randomly chosen co-signers are relieved of their responsibility after loan approval but before the

loans are disbursed. Comparing the riskiness of the uses the loans are put to across treatments (i), (ii), and (iii) would shed light on the impact of social ties in financing on risk choices.²²

An empirical challenge is also how to identify the various channels through which altruistic relationships operate. To discriminate between the emergency funds motive and social risk aversion, one could study the impact of variations in the scope or proclivity for charitable transfers, in relative wealth, and in the relative strength or direction of the altruistic feelings. To discriminate between the unconditional altruism models and the gift exchange model, one could monitor the impact on relationship quality or study the role of anonymity. In the context of microfinance, one could design an experiment in which full repayment by some borrower is a prerequisite for loans to another, more or less socially connected borrower, and compare treatments where (iv) this is common knowledge, (v) the first borrower knows that the second one is unaware of the conditionality, and (vi) no such conditionality is imposed.

6.2 Social intermediation

According to the theories in this paper, institutions that want to harness social relations for financial transactions should be concerned about (how to reduce) social risk aversion and social tensions. Arrangements that foster social incentives but limit direct exposure to close acquaintances may reduce such shadow costs.

Gemachs, also referred to as Jewish or Hebrew Free Loan Societies, collect money from donors in a community and dispense interest-free loans to borrowers from the same community. This induces generosity, because the donors know that the loans benefit their community, and improves incentives because the borrowers know they are repaying their community. Importantly, *gemachs* usually operate on the basis of anonymity: with the fund run by third parties (such as rabbis), borrowers and donors know little of each other than that they are members of the same community. This reduces social tensions (e.g., shame, guilt, indignation, social obligations) relative to direct or non-anonymous lending relations. Still, *gemachs* are a last recourse rather than a regular financing source (as the first best outcomes of our models predict), typically experiencing revivals when formal credit dries up, such as in the US during the late financial crisis (Waldman, 2009; Freedman, 2011).

So-called *community loan funds* are a more formal version of this. Community loan funds pool money invested or donated by local individuals and organizations and then target loans to, for example, non-profit organizations for community improvement, micro enterprises for business development, and individuals for home ownership and repair. Again, the ties to the community elicit social incentives but the formal intermediation avoids the social tension that more direct financial interactions between members of the community might provoke.

Perhaps the best example are firms that administer loans between relatives or friends. In the US, such *social lending intermediaries* include LendFriend, Lending Karma, LoanBack, One2One Lending, WikiLoan, ZimpleMoney, Prosper, Bainco, CircleLending, and National Family Mortgage. Since they neither screen, match, nor search for counterparties, and provide neither capital nor diversification, they are difficult to explain with traditional theories of intermediation. As the following quote illustrates, the basic premise of this business is that the formalization and third-party enforcement of financial transactions between relatives or friends safeguards those relationships:

If you're intent on raising money from friends and family, proceed with your eyes open. And one excellent path to take is to structure the money as a loan and use

²²See Karlan et al. (2009) for an actual field experiment on which this idea is based.

CircleLending to administer the loan. CircleLending administers loans between you and friends, but they keep the business and emotions separate ... Raising money from friends and family seems attractive: potentially good rates, lenient credit standards, and a chance for your friends and family to share in the wealth you create. Just make sure to manage the downside, and find any way you can to keep the love and affection firmly separated from the business transactions (Robbins, 2001).

Crowdfunding platforms often also mix formal intermediation with social relations. Agrawal et al. (2012) empirically study financing patterns on the crowdfunding platform Sellaband through which musicians can raise funds to produce new albums. They find that early contributions often come from family and friends. Given that the crowdfunding platform is remunerated in proportion to the total amount raised, this begs the question why this family finance is provided “online” rather than “offline.” One possible explanation is that the platform, by formalizing the terms and introducing third-party enforcement, allows friends and relatives to finance the artist at lesser social frictions. For example, the authors speculate that

One benefit of crowdfunding in terms of raising funds from [family and friends] might be that the structure of the website makes it easier to ask for money and commit it to a particular use (6).

6.3 Microfinance

In their survey of financial management practices among the poor, Collins et al. (2010: 16) find that “almost every household borrowed informally from family and friends” though many of the households report that “they found informal transactions unpleasant but unavoidable.” Another central finding of the above study is that the poor use such financing primarily to ensure dependable cash flows and to manage risks. This is because uncertainty is one of their overarching concerns (18):

[The households] are, as a group, less healthy, live in neighborhoods with weaker security, and face income volatility tied to the swings of local supply and demand, no matter whether they are employed or self-employed or are small-scale entrepreneurs ... most adults in poor households ... experience occasional or chronic anxiety about these risks, and seek to mitigate them in every way they can, including managing their money.

One way the poor deal with the risks and anxiety they (already) face is to be conservative; they take few risks.²³ The social preference theories suggest that this should be true with respect to not only their own money but also money from family and friends. If so, family finance should primarily serve safe purposes, such as consumption smoothing (e.g., Udry (1996)), insurance (e.g., Ambrus et al. (2010)), or simply charity, rather than for taking on *additional* risks.

Similar observations have been made about microfinance. Recent evidence suggests that microloans designated as commercial loans are commonly used for safe business purposes, such as working capital rather than capital expenditure, or even non-business purposes, such as consumption smoothing (Collins et al. (2011): 47), and less (than expected) for risk taking and growth. According to Banerjee and Duflo (2010: Chapter 6), part of the explanation is that microlending

²³Banerjee and Duflo (2010) emphasize this point and provide an example of how such conservatism can deter the adoption of productivity-enhancing technology.

is designed to minimize default, that is, it makes “zero default” imperative. Consider, for example, joint-liability group lending, the idea behind which is that social pressure induces group members to repay each loan. But while improving repayment incentives, it also induces risk avoidance, as members will be reluctant to take risks lest they could default and harvest the anger of the others. As Ghatak and Guinnane (1999: 225) write,

When things go wrong, such as when an entire group is denied future loans, bitterness and recrimination among group members may have far-reaching consequences for village life. This risk is inherent in the system and needs to be viewed as a potential cost.

Such social tensions, as intended, deter default. But intolerance of default is antithetical to providing *risk* capital.

The idea of combining social relations (for incentives and information) and formal intermediation (to protect those relations) discussed in the previous section is applicable also to microfinance. For the sake of argument, we speculate about such an arrangement: A non-governmental organization (NGO) has a starting endowment of E . It seeks to finance SMEs in a small village. It identifies candidate entrepreneurs, all of whom have social relations in the village. Part of the endowment, E_1 , goes into a village fund. By anonymous vote, the villagers rank the entrepreneurs, and the village fund is invested into the different businesses in accordance with the vote. The NGO complements the village investments with investments out of the formal fund $E_2 = E - E_1$. Part of the profits that accrue to the village fund is distributed to the villagers; the rest is added to the principal. Similarly, profits that accrue to the formal fund are paid out to the NGO or reinvested. All contracts, funds, and transfers are administered by the NGO, not by the villagers. The first screening uses the NGO’s expertise. The village vote and its fund harness the social relations for information and incentives, respectively. Anonymity of the vote, NGO funding, and NGO administration protect the social relations. Moreover, the villagers do not risk their existing wealth, and there is some diversification across the village fund’s investments. The profits that accrue to the villagers can be viewed as performance-sensitive commissions for providing information and incentives; they bear no downside risk.

6.4 Legal liability vs. social debt

In the gift exchange model, the shadow cost of family finance is that the debt is, even if not legally, socially persistent.²⁴ The key strength of formal outside finance is therefore that it can implement limited liability; a ‘clean slate’ does not always require paying all one’s dues. The evolution of bankruptcy reflects the importance of this feature: Historically, the legal norm for loans used to be personal liability. Such personal liability could mean slavery for delinquent debtors and sometimes their entire households, imprisonment, or even the death penalty (Levinthal (1918)). But already in ancient times, there was an awareness that unlimited liability could be harmful. Deuteronomy 15:1-2 says,

²⁴That the notion of debt exists as a social and moral concept outside the legal context is reflected in wordings such as *forgive us our debt* in the Lord’s Prayer, religious parables likening sinners to debtors, and the idioms *you owe me* and *to pay a debt of gratitude*. In some languages, the parallel is so deep-rooted that the same word means debt or guilt (e.g., *Schuld* in German). In *Payback*, Margaret Atwood (2008) offers a wide-ranging discussion of the anthropological, both cultural and biological, roots of the social conception of “debt.”

At the end of every seven years thou shalt make a release. Every creditor that lendeth ought unto his neighbor shall release it; he shall not exact it of his neighbor, or of his brother, because it is the Lord's release.²⁵

Similarly, the ancient Babylonian Code of Hammurabi (117) states,

If anyone fails to meet a claim for debt, sells himself, his wife, his son, and his daughter for money or gives them away to forced labor: they shall work for three years . . . and in the fourth year they shall be set free.

The core of Julius Caesar's bankruptcy reform, considered by many a blueprint of modern bankruptcy law, was also to limit liability, allowing bankrupt borrowers to walk away with the basic tools of trade and related lands and limiting the liability of the borrower's family. Caesar's express intention was that the borrower could start over, with a clean slate, rather than waste talent in bondage.

This *tabula rasa* approach to bankruptcy was lost in the Middle Ages but reemerged during the Enlightenment. By the 1800s, England periodically released debt prisoners and forgave their debts. The US federal government abolished debtor prisons in 1833. This was followed by decades of legislative bargaining about bankruptcy law, during which Daniel Webster in a famous speech argued that persistence of debt harms society:

I verily believe that the power of perpetuating debts against debtors, for no substantial good to the creditor himself, and the power of imprisonment for debt . . . If any public good were attained, any high political object answered, by such laws, there might be some reason for counselling submission and sufferance to individuals. But the result is bad, every way. It is bad to the public and to the country, which loses the effort and the industry of so many useful and capable citizens. It is bad to creditors, because there is no security against preferences, no principle of equality, and no encouragement for honest, fair, and seasonable assignment of effects. As to the debtor, however good his intentions or earnest his endeavors, it subdues his spirit and degrades him in his own esteem (Skeel (2003): 26).

A related historical account is that limited liability was an institutional response to the need for risk taking and growth, and thus instrumental, during the Industrial Revolution (see, for example, Landes, 1999: Chapter 17). So, the evolution of bankruptcy law has been a transition from personal bondage to limited liability.

We argue that this evolution distinguishes formal outside finance from family finance. Legal liability is specified in contracts and enforced by courts, while social obligations are defined by emotions, norms, and social pressure. Given its different *modus operandi*, formal outside finance can limit liability where social obligations would persist (Section 4.3) or enforce liability where social incentives would have no bite (Section 5.3), thereby avoiding shadow costs that make family finance unattractive.

²⁵Asking why any lending occurred in the shadow of such future leniency, Atwood-4(2)3(0)3(0)3(8)3(3):-386(4)3(8)3(3))-379(s)2(u)-7(1) because the lendings and borrowings took place within small communities. You didn't have to wipe out the debt owed to you by foreigners – only those within the group where relations with the next-door neighbours were cradle-to-grave and tightly knit, . . . so you'd ultimately be repaid somehow for a forgiven debt, even if it wasn't with money." In other words, Atwood hypothesizes that, *socially*, the obligations persisted at least in part. At the same time, there must have been a reason for codifying the obligation to forgive debt within the community.

In essence, we argue that *contractual* designs of liability are more flexible than *social* obligations. This argument presumes that social obligations, unlike contract liabilities, cannot credibly be finetuned ex ante; if this were possible, social obligations would dominate formal contracts in our model. One justification for this assumption is that social tensions arise from norm violations that elicit emotional responses, such as disappointment, anger, or indignation, that are hard – perhaps impossible – to suppress ex post. But rather than being only a disadvantage, this rigidity has purpose. If emotional reactions were contractible, they would – like contractual liabilities – be renegotiable as well. This would render the threat of ex post (inefficient) social tensions an empty one, undermining the positive ex ante effects. In other words, the willfulness of the emotions is the *source* of commitment. This is consistent with the emotions-as-commitment theory in evolutionary psychology, according to which certain emotions evolved as commitment devices (see Haselton and Ketelaar (2006) and the references therein).

7 Concluding remarks

We argue that existing theories of informal finance do not account for some stylized facts about financing between relatives and friends, which arguably makes up the largest share of informal finance, and propose alternative theories in which a family investor differs from an outside investor (not in costs, capital, or information but) merely in that her relationship to the investee is characterized by (pro)social preferences. We consider three social preference relations – gift exchange and two variants of unconditional altruism – and find that they imply different shadow costs of family finance: the emergency funds motive, social risk aversion, and social tension.

The unified picture that emerges is that social preferences, even when as parsimonious as standard altruism, produce a trade-off between incentive benefits and the aforementioned shadow costs and thereby a complex set of predictions: When needed, relatives and friends are willing to provide finance at below market, even negative, required returns, and yet the investee uses outside finance as much as she can. Furthermore, while using the money of relatives and friends mitigates agency problems, its shadow costs can lead to excessively conservative investments, whereas outside finance encourages risk taking. It can hence be optimal to combine the two sources: to harness social relations for incentives and to weave in formality to mitigate the social repercussions. Our results suggest that family finance is (i) suitable at early stages of a firm but inherently constrains entrepreneurial risk taking and growth and (ii) suitable for mitigating endogenous risks (moral hazard) but unsuitable for ventures with significant exogenous risks (uncertainty). Compared to other theories of informal finance, our social preference models emphasize the *disadvantages* of basing financial transactions on social relations and suggest that *impersonal* financial relations may be critical to certain types of entrepreneurial activity.

We have clearly left several issues unaddressed. Two strike us as particularly salient. First, our models abstract from the question of security design, such as whether, or when, a family investor should receive debt or equity. Robb and Robinson (2012) document that, in their Kauffman Firm Survey data, family equity is rarer than family debt but more frequent than outside equity, and when used often an important financing source for the firm in question. We conjecture that the trade-offs discussed in this paper affect optimal security design: debt would impose less risk on family and friends, which reduces shadow costs, but giving them equity would create stronger social incentives. Second, we have not considered the endogenous formation of social relations. A larger number of altruistic relations might allow the entrepreneur to diversify certain “social risks.” If forming or

maintaining social relationships is costly (e.g., more offspring, strategic marriages, spending more time with family and friends), an optimal network size exists. Furthermore, improvements in the provision of formal finance (e.g., stricter enforcement, better monitoring) would reduce the optimal network size, as the importance of social relations for financial transactions would decrease. Such effects of formal institutions on the value of social ties may be related to broader changes in social structure, such as family size and marriage choices.

Last, the insights of this paper might apply to other contexts in which social ties influence financial transactions. For example, in the banking literature it has been shown that “distance” (e.g., local vs. non-local banks) is important for lending relationships, and it has been suggested that proximity to borrowers gives lenders better “soft” information (e.g., Berger et al. (2005)). If loan officers share social ties with local borrowers, which may be the case especially in small communities, information may not be the only aspect that distinguishes local lending relationships. Financing and investment decisions can also interact with personal relationships within firms. For example, in a family of funds, top management may invest in its own funds, and (fettered) fund of funds invest in funds of its own family, in which case fund managers would be entrusted funding from people they frequently interact with professionally, and possibly socially. Such labor market, or social, relationships may then influence the “financing” relations inside the firm, and hence investment decisions.

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Appendix: Proofs

Lemma 2

Proof. First consider (2). The left-hand side (LHS) is continuous and monotonically increasing in R_O . For $R_O = 0$, the LHS is $u_O(W - \hat{l})$ which is smaller than the right-hand side (RHS). For $R_O = R$, the LHS is $qu_O(W - \hat{l} + R) + (1 - q)u_O(W - \hat{l})$, which, by Assumption 1, is larger than the RHS for some $\hat{l} \geq l$. For such \hat{l} , (2) pins down a unique solution for R_O by the Intermediate Value Theorem. Similarly, consider (3). For any given R_O , the LHS is continuous in R_F , and as long as F is unwilling to grant cash to A , monotonically increasing in R_F . Thus, it has at most one solution. \square

Proposition 1

Proof. The indirect utility function is derived as follows. First, when $\Pi_{AF} < \frac{\min}{F}$, all of Π_{AF} is given to A . Second, note that the possibility of $\Pi_{AF} < \frac{\min}{F}$ implies $qR - l < \frac{\min}{F}$, since the net present value of the project, $qR - l$, is a lower bound on Π_{AF} if the project is undertaken. Third, if $qR - l < \frac{\min}{F}$, A 's consumption is $\frac{\min}{F}$ for $\Pi_{AF} > \frac{\min}{F}$, while $\Pi_{AF} - \frac{\min}{F}$ is retained by F . Finally, note that intra-family transfers occur if and only if $qR - l < \frac{\min}{F}$; otherwise, simply selling the entire project to F puts A 's consumption above $\frac{\min}{F}$, in which case F is unwilling to make a charitable transfer and the indirect utility function is instead $U_{AF}^*(\Pi_{AF}) = u_A(qR - l) + \Pi_{AF} - (qR - l)$. Taken together, this means that the indirect utility function is given by (9) when intra-family transfers occur with positive probability.

Taking (9) as given, consider expected family utility under both types of finance. Under outside finance, O buys the project for $qR - l$ from A , so that family wealth is $W + qR - l = q(W - l + R) + (1 - q)(W - l)$. Expected family utility is $U_{AF}^*[q(W - l + R) + (1 - q)(W - l)]$. Under family finance, family wealth is $W - l + R$ if the project succeeds and $W - l$ otherwise. Expected family utility is therefore $qU_{AF}^*(W - l + R) + (1 - q)U_{AF}^*(W - l)$. Now note that, by Jensen's inequality,

$$qU_{AF}^*(W - l + R) + (1 - q)U_{AF}^*(W - l) \leq U_{AF}^*[q(W - l + R) + (1 - q)(W - l)]$$

since $U_{AF}^*(\Pi_{AF})$ is concave and *strictly* concave for $\Pi_{AF} \leq \frac{\min}{AF}$. The inequality is strict if and only if $W - l < \frac{\min}{F}$, in which case expected family utility is lower under family finance than under outside finance.

Last, note that F 's participation constraint requires that he fares as well under family finance as under outside finance. Hence, if $W - l < \frac{\min}{F}$, A 's expected utility is strictly lower under family finance than under outside finance, but otherwise the same. \square

Lemma 4

Proof. Subtract the RHS from the LHS in (10), and denote the difference as H . By the analytic Implicit Function Theorem, we have

$$\frac{R_F}{e} = -\frac{H/e}{H/R_F}.$$

Consider first

$$H/R_F = q[e - (1 - e)u'_A(l_F - l + R - R_F)].$$

We assume here $l_F - l + R - R_F \geq \frac{\min}{A}$; (8) thus implies $u'_A(l_F - l + R - R_F) < \frac{e}{1-e}$ and thereby $H/ R_F > 0$. The only alternative is that A retains her minimum consumption $\frac{\min}{A}$ when the project succeeds. In that case, $H/ R_F = qe > 0$. To prove the lemma, it remains to establish that $H/ e < 0$.

So consider

$$H/ e = [qu_F(W - l_F + R_F) + (1 - q)u_F(0) - u_F(W - \frac{\min}{A})] - [qu_A(l_F - l + R - R_F) + (1 - q)u_A(W - l) - u_A(\frac{\min}{A})].$$

Define the term in the first bracket as T_1 and the term in the second bracket as T_2 , so that $H/ e = T_1 - T_2$. Now rewrite the break-even constraint (10) as follows

$$e [qu_F(W - l_F + R_F) + (1 - q)u_F(0) - u_F(W - \frac{\min}{A})] - e [qu_A(l_F - l + R - R_F) + (1 - q)u_A(W - l) - u_A(\frac{\min}{A})] = - [qu_A(l_F - l + R - R_F) + (1 - q)u_A(W - l) - u_A(\frac{\min}{A})].$$

Defining the term in the last line as $-T_3$, note that this can be written as $T_1 - T_2 = -\frac{1}{e}T_3$, or

$$H/ e = -\frac{1}{e}T_3.$$

Note that T_1 and T_2 are, respectively, F's and A's gain in expected *selfish* utility from undertaking the project under this contract. If $T_2 > 0$, then $H/ e < 0$, thus establishing the lemma.

Recall that expected family utility is $E(U_{AF}) = E(U_A) + E(U_F)$. The project is undertaken only if there are gains from trade, i.e., if the gain in expected family utility from undertaking the project is positive: $\Delta E(U_{AF}) = \Delta E(U_A) + \Delta E(U_F) > 0$. The break-even constraint (10), by definition, implies that the gain in F's expected utility from financing the project is $\Delta E(U_F) = 0$, which can be written as

$$eT_1 + (1 - e)T_2 = 0. \quad (29)$$

When $\Delta E(U_F) = 0$, the gains from trade accrue to A, i.e., $\Delta E(U_A) > 0$, which can be written as

$$eT_2 + (1 - e)T_1 > 0. \quad (30)$$

Since (29) implies $T_1 = -\frac{1-e}{e}T_2$, (29) and (30) can hold only jointly if

$$\frac{e}{1-e}T_2 > \frac{1-e}{e}T_2.$$

Given that $e \in [1/2, 1]$, this is only true if $T_2 \geq 0$. By (29), $T_2 = 0$ would imply $T_1 = 0$ and hence $\Delta E(U_A) = 0$, which in turn would imply the absence of any gains from trade. Thus, if $\Delta E(U_{AF}) > 0$, then $T_2 > 0$. \square

Proposition 2

Proof. Most of the proof is in the text. Here, we formally derive the incentive-compatibility constraints (11) and (12).

Because private benefits are unobservable, F cannot learn from the absence of project cash flow whether A consumes private benefits or would have zero consumption absent charitable transfers. To F , these two possibilities are in the same information set. So, whether F makes a charitable transfer to A depends on his (posterior) beliefs. In Perfect Bayesian Equilibrium (PBE), these beliefs must be consistent with equilibrium play. In equilibrium, given that $e > \underline{e}$, the project is financed only if A 's incentive-compatibility constraint is satisfied. In constructing such a PBE, the only admissible beliefs are hence that, absent charitable transfers, A 's consumption is 0 when the project cash flow is 0. In constructing the incentive-compatibility constraints, we accordingly assume that A receives a charitable transfer (in addition to potential private benefits) if she shirks.

Under outside finance, A works if and only if

$$\begin{aligned} q[eu_A(\Delta_I + R - R_O) + (1 - e)u_F(W)] + \\ (1 - q)[eu_A(\frac{\min}{A}) + (1 - e)u_F(W - \frac{\min}{A})] \geq \\ q[eu_A(\Delta_I + B + \frac{\min}{A}) + (1 - e)u_F(W - \frac{\min}{A})] + \\ (1 - q)[eu_A(\frac{\min}{A}) + (1 - e)u_F(W - \frac{\min}{A})]. \end{aligned}$$

Under family finance, the corresponding condition is

$$\begin{aligned} q[eu_A(\Delta_I + R - R_F) + (1 - e)u_F(W - \hat{I} + R_F)] + \\ (1 - q)[eu_A(W - I) + (1 - e)u_F(0)] \geq \\ q[eu_A(B + W - I) + (1 - e)u_F(0)] + \\ (1 - q)[eu_A(W - I) + (1 - e)u_F(0)]. \end{aligned}$$

First, note that A 's utility when the project fails to deliver a payoff (be it a private benefit or the cash flow) is independent of whether she works or shirks. In either case, A 's and F 's is determined by the charitable transfer that F implements given family wealth, which is independent of A 's action whenever the project fails. In either financing scheme, the utilities under project failure thus cancel out of the constraint. This gives

$$\begin{aligned} eu_A(\Delta_I + R - R_O) + (1 - e)u_F(W) \geq \\ eu_A(\Delta_I + B + \frac{\min}{A}) + (1 - e)u_F(W - \frac{\min}{A}) \end{aligned}$$

and

$$\begin{aligned} eu_A(\Delta_I + R - R_F) + (1 - e)u_F(W - \hat{I} + R_F) \geq \\ eu_A(B + W - I) + (1 - e)u_F(0). \end{aligned}$$

Second, we collect all terms with u_A on the LHS and all terms with u_F on the RHS to get (11) and (12). \square

Proposition 3

Proof. Consider the participations constraints (14) and (15). First, (14) defines a unique R_O . Second, the RHS (LHS) in (15) is strictly increasing (constant) in R_F for $e > 1/2$. Thus, (15) pins

down a unique R_F for any R_O . Last, substituting $R_F = R_O$ in (15) and canceling terms yields $R_O = \hat{I}/q$, i.e., (14).

Now consider (16) and (33). In (16),

$$E(e_A) = qe(R - R_O) + e\Delta_I + (1 - e)W. \quad (31)$$

In (33),

$$E(e_A) = qe(R - R_F) + e\Delta_I + (1 - e)(W + qR_F - \hat{I}). \quad (32)$$

Given $R_F = R_O$ and $qR_O = \hat{I}$, (32) reduces to (31). However, note that e_A has a smaller variance in (16) than in (33). For u_A strictly concave, (16) is thus larger than (33). \square

Corollary 2

Proof. Let $\Delta_I = I_O + I_F - I \geq 0$. Under co-financing, F's break-even constraint is

$$q[e(W - I_F + R_F) + (1 - e)(\Delta_I + R - R_F - R_O)] + (1 - q)[e(W - I_F) + (1 - e)\Delta_I] = eW.$$

Solving this for R_F yields (18). Similarly, A's incentive-compatibility constraint in this case is

$$\begin{aligned} qu_A[e(\Delta_I + R - R_F - R_O) + (1 - e)(W - I_F + R_F)] + (1 - q)u_A[e\Delta_I + (1 - e)(W - I_F)] \\ \geq qu_A[e(\Delta_I + B) + (1 - e)(W - I_F)] + (1 - q)u_A[e\Delta_I + (1 - e)(W - I_F)], \end{aligned}$$

which simplifies to

$$(2 - 1/e)R_F \leq R - R_O - B. \quad (33)$$

Substituting (18) and $R_O = I_O/q$ into (33) and rearranging gives

$$(2e - 1)I_F \leq e(qR - I_O - qB) + (1 - e)(qR - I).$$

A prefers to choose I_F just large enough to make this constraint bind. Further substituting $I_O = \Delta_I + I - I_F$ and simplifying then gives

$$I_F = \frac{e(\Delta_I + qB) - (qR - I)}{1 - e}. \quad (34)$$

Clearly, using (34), $I_F/e > 0$ and hence, given $I_O = \Delta_I + I - I_F$, $I_O/e < 0$. \square

Lemma 6

Proof. It is immediate from inspection that $R_F(c) = I$ and $R'_F(c) < 0$. It remains to show that R_F is strictly smaller than $R_O = I/q$. This is true when

$$\frac{1 - \bar{\alpha}}{1 - \bar{\alpha}[q + (1 - q)c]} < \frac{1}{q}. \quad (35)$$

Case 1. $1 - \bar{\alpha}[q + (1 - q)c] < 0$. Rearranging this inequality gives

$$\frac{1 - \bar{\alpha}q}{1 - q} < \bar{\alpha}c.$$

Given $\bar{\alpha} \leq 1$, the LHS is weakly larger than 1. So, this inequality contradicts (20). This case is hence irrelevant.

Case 2. $1 - \bar{a}[q + (1 - q)c] > 0$. In this case, (35) can be rearranged to

$$1 - \bar{a}c > q(1 - \bar{a}c),$$

which is implied by (20). This proves that $R_F(c) < R_O$. □

Proposition 5

Proof. Substituting $R_F = I$ on the LHS of (22). Simplifying then yields

$$1 \geq q + (1 - q)c,$$

which is a contradiction for $c > 1$ and holds with strict equality for $c = 1$. Now recall that $R_F(c) > I$ for $c > 1$, and note that if (22) is violated for $R_F = I$, it is *a fortiori* violated for $R_F > I$. □

Size constraints with paternalistic altruism and social risk aversion

For a given $R_F(I)$, A chooses her preferred project size by solving

$$\max_{I \in [0, W]} qu_A[e(R(I) - R_F(I)) + (1 - e)(W - I + R_F(I))] + (1 - q)u_A[(1 - e)(W - I)].$$

Differentiating with respect to I yields

$$qu'_A[e(R(I) - R_F(I)) + (1 - e)(W - I + R_F(I))] \times \\ [e(R'(I) - R'_F(I)) + (1 - e)(R'_F(I) - 1)] - (1 - q)u'_A[(1 - e)(W - I)].$$

As in the case of standard altruism, the last term increases in I since $u''_A < 0$, and if the Inada conditions hold, the solution to the maximization problem is interior, irrespective of $R_F(I)$.

Lemma 7

Proof. First, note that, for $\bar{R} - R_O > 0$, the numerator of

$$'(R_O) = \frac{u_A(\bar{R} - R_O)u'_A(R - R_O) - u_A(R - R_O)u'_A(\bar{R} - R_O)}{[u_A(R - R_O)]^2}$$

is negative because $u_A(\bar{R} - R_O) < u_A(R - R_O)$ as well as $u'_A(R - R_O) < u'_A(\bar{R} - R_O)$, since $u' > 0$ and $u'' < 0$. Second, note that, whenever $(\bar{R} - R_O)^+ = 0$, $'(R_O) = 0$ provided that $R - R_O > 0$. (If $\bar{R} - R_O = 0$, A is strictly indifferent between the projects for any and all q , and $'(R_O)$ is undefined.) Third, note that

$$(0) = \frac{u(\bar{R})}{u(R)} > \frac{\bar{R}}{R}$$

because

$$\frac{u(\bar{R})}{\bar{R}} > \frac{u(R)}{R}$$

for $u'' < 0$ and $\bar{R} < R$. □

Proposition 8

Proof. To begin with, note that $R_F < R_O$ for obvious reasons mentioned in the text. To see that this makes A more conservative, suppose $\Delta_{Alt} = 0$ so that (26) reduces to

$$q \geq \frac{u_A((\bar{R} - R_F)^+)}{u_A(R - R_F)}, \quad (36)$$

which is identical to (25) except that R_F replaces R_O . So we can apply Lemma 7.

Next, consider the impact of Δ_{Alt} . If $\Delta_{Alt} < 0$, it makes A more conservative. We distinguish two parameter cases: First, assume $R_F < \bar{R}$. Indeed, in that case,

$$\Delta_{Alt} = (1 - q)[u_F(W - I) - u_F(W - I + R_F)] < 0.$$

Second, assume $\bar{R} \leq R_F \leq R$. Here, the RHS of (26) is 0. The LHS is strictly positive for $\bar{R} = R_F$, in which case (26) again reduces to (36). Furthermore, for $\bar{R} < R_F$, the derivative of the LHS with respect to R_F is

$$-qu'_A(R - R_F) - \frac{1 - e}{e}(1 - q)u'_F(W - I + R_F) < 0,$$

and the LHS converges to

$$\frac{1 - e}{e}[qu_F(W - I + R) + (1 - q)u_F(W - I) - u_F(W - I + \bar{R})]$$

as $R_F \rightarrow R$. This term is positive if F would rather self-finance the risky project than the safe project (i.e., when the term in the brackets is positive), which holds by assumption. Thus, for $\bar{R} \leq R_F \leq R$, the RHS of (26) is 0 and the LHS is strictly positive, so that A always takes the risky project.

To sum up, suppose $R_F = R_O = \hat{R}$. If $\hat{R} < \bar{R}$, A is more conservative under family finance; if $\bar{R} \leq \hat{R} \leq R$, she always prefers the risky project irrespective of her source of financing. In addition, it is generally the case that $R_F < R_O$, which unambiguously makes A more conservative under family finance. \square

Risk choice with standard altruism and the emergency funds motive

Staying within the setting of Section 5.2.1, we now assume that (i) A receives charitable transfers if she takes the risky project and the project fails and (ii) family finance reduces the amount of funds available for such charity. That is, we assume $R_O, R_F \leq R - \frac{\min}{A}$ and $W - I < \frac{\min}{A}$. In addition, we distinguish two cases.

Case 1. $R_O, R_F \leq \bar{R} - \frac{\min}{A}$. In this case, A receives no charitable transfers if she takes the safe project. Under outside finance, the entrepreneur chooses the risky project if and only if

$$\begin{aligned} e[qu_A(R - R_O) + (1 - q)u_A(\frac{\min}{A})] + \\ (1 - e)[qu_F(W) + (1 - q)u_F(W - \frac{\min}{A})] \geq \\ eu_A(\bar{R} - R_O) + (1 - e)u_F(W), \end{aligned}$$

which simplifies to

$$\underbrace{e[qu_A(R - R_O) - u_A(\bar{R} - R_O)]}_{K_2^O} + \underbrace{(1 - q)u_A(\frac{\min}{A})}_{K_3^O} + (1 - e)(1 - q)\underbrace{[u_F(W - \frac{\min}{A}) - u_F(W)]}_{K_1^O} \geq 0$$

Under family finance, she chooses the risky project if and only if

$$e[qu_A(R - R_F) + (1 - q)u_A(W - I)] + (1 - e)[qu_F(W - I + R_F) + (1 - q)u_F(0)] \geq eu_A(\bar{R} - R_F) + (1 - e)u_F(W - I + R_F),$$

which simplifies to

$$\underbrace{e[qu_A(R - R_F) - u_A(\bar{R} - R_F)]}_{K_2^F} + \underbrace{(1 - q)u_A(W - I)}_{K_3^F} + (1 - e)(1 - q)\underbrace{[u_F(0) - u_F(W - I + R_F)]}_{K_1^F} \geq 0.$$

Clearly, $K_1^F < K_1^O$, which captures the effect that A internalizes the impact of choosing the risky project on F. This impact is larger under family finance as long as $R_F \geq I$. Also, note that

$$K_2^F - R_F = -qu'_A(R - R_F) + u'_A(\bar{R} - R_F) > 0$$

since $u'_A(\bar{R} - R_F) > u'_A(R - R_F)$ given $u'' < 0$. Thus, for $R_F \leq R_O$, which is plausible as argued in the text, $K_2^F < K_2^O$. This captures the effect of Lemma 7 that family finance, being cheaper, allocates more cash flow risk to A so that her risk aversion has more impact on project choice. Both these effects are present in the case without charitable transfers, but the third effect is new: $K_3^F < K_3^O$ reflects that there is less intra-family insurance available under family finance, which makes it less appealing for A to choose the risky project.

Case 2. $R_O, R_F > \bar{R} - \frac{\min}{A}$. In this case, A receives charitable transfers if she chooses the safe project. There are two subcases.

- $\bar{R} - R_O < 0$. In this case, it is straightforward to show that A chooses the risky project under either type of finance. Under outside finance, A chooses the risky project if and only if

$$e[qu_A(R - R_O) + (1 - q)u_A(\frac{\min}{A})] + (1 - e)[qu_F(W) + (1 - q)u_F(W - \frac{\min}{A})] \geq eu_A(\frac{\min}{A}) + (1 - e)u_F(W - \frac{\min}{A}),$$

which simplifies to

$$e[u_A(R - R_O) - u_A(\frac{\min}{A})] + (1 - e)q[u_F(W) - u_F(W - \frac{\min}{A})] \geq 0.$$

This is always true since $R_O < R - \frac{\min}{A}$. Under family finance, A chooses the risky project if and only if

$$\begin{aligned} e[qu_A(R - R_F) + (1 - q)u_A(W - I)] \\ + (1 - e)[qu_F(W - I + R_F) + (1 - q)u_F(0)] \geq \\ eu_A(W - I) + (1 - e)u_F(0), \end{aligned}$$

which simplifies to

$$eq[u_A(R - R_F) - u_A(W - I)] + (1 - e)q[u_F(W - I + R_F) - u_F(0)] \geq 0.$$

This is always true since $W - I < \frac{\min}{A} < R - R_F$.

- $\bar{R} - R_O \geq 0$. In this case, family finance may lead to more risk taking than outside finance. Under family finance, the condition under which A chooses the risky project is the same as in the previous subcase, which always holds. Under outside finance, A chooses the risky project if and only if

$$\begin{aligned} e[qu_A(R - R_O) + (1 - q)u_A(\frac{\min}{A})] + \\ (1 - e)[qu_F(W) + (1 - q)u_F(W - \frac{\min}{A})] \geq \\ eu_A(\frac{\min}{A}) + (1 - e)u_F(W - \frac{\min}{A} + (\bar{R} - R_O)), \end{aligned}$$

which simplifies to

$$\begin{aligned} eq[u_A(R - R_O) - u_A(\frac{\min}{A})] + \\ (1 - e)[qu_F(W) + (1 - q)u_F(W - \frac{\min}{A}) - u_F(W - \frac{\min}{A} + (\bar{R} - R_O))] \geq 0. \end{aligned}$$

This need not always be true since the second term can be negative.

Risk choice with paternalistic altruism and social risk aversion

Staying within the setting of Section 5.2.1, we now assume paternalistic preferences between A and F instead of standard altruistic preferences. We assume $R_O, R_F \leq R$. In addition, we distinguish two cases.

Case 1. $R_O, R_F > \bar{R}$. In this case, there is a partial default when A takes the safe project. Then, under outside finance, A takes the risky project if and only if

$$qu_A(e(R - R_O) + (1 - e)W) + (1 - q)u_A((1 - e)W) \geq u_A((1 - e)W),$$

which simplifies to

$$u_A(e(R - R_O) + (1 - e)W) - u_A((1 - e)W) \geq 0.$$

This is always true. Under family finance, she takes the risky project if and only if

$$qu_A(e(R - R_F) + (1 - e)(W - I + R_F)) + (1 - q)u_A((1 - e)(W - I)) \geq u_A((1 - e)(W - I + \bar{R}))$$

which can be written as

$$q \geq \frac{u_A((1-e)(W-l+\bar{R})) - u_A((1-e)(W-l))}{u_A(e(R-R_F) + (1-e)(W-l+R_F)) - u_A((1-e)(W-l))} \equiv z(R_F).$$

This is violated for sufficiently low q . To see that A can be *too* conservative, assume $u_A(\cdot) = \ln \cdot$, $W-l=1$, $\bar{R}=3$, $R=5$, and $e=0.9$. In this example, $z(R) \approx 0.77 > 0.6 = \bar{R}/R$. Since $z(R_F)$ is continuous for $R_F \in [0, R]$, this implies the existence of a non-empty interval $[\underline{R}_F, R]$ such that $z(R) > \bar{R}/R$ for all $R_F \in [\underline{R}_F, R]$.

Case 2. $R_O, R_F \leq \bar{R}$. In this case, A does not default when she takes the safe project. Then, under outside finance, A takes the risky project if and only if

$$qu_A(e(R-R_O) + (1-e)W) + (1-q)u_A((1-e)W) \geq u_A(e(\bar{R}-R_O) + (1-e)W), \quad (37)$$

which can be written as

$$q \geq \frac{u_A(e\bar{R} - eR_O + (1-e)W) - u_A((1-e)W)}{u_A(eR - eR_O + (1-e)W) - u_A((1-e)W)}. \quad (38)$$

Under family finance, she takes the risky project if and only if

$$qu_A(e(R-R_F) + (1-e)(W-l+R_F)) + (1-q)u_A((1-e)(W-l)) \geq u_A(e(\bar{R}-R_F) + (1-e)(W-l+R_F)), \quad (39)$$

which can be written as

$$q \geq \frac{u_A(e\bar{R} - (2e-1)R_F + (1-e)(W-l)) - u_A((1-e)(W-l))}{u_A(eR - (2e-1)R_F + (1-e)(W-l)) - u_A((1-e)(W-l))}. \quad (40)$$

Define

$$(R_F, l) \equiv \frac{u_A(e\bar{R} - R_F + (1-e)(W-l)) - u_A((1-e)(W-l))}{u_A(eR - R_F + (1-e)(W-l)) - u_A((1-e)(W-l))}.$$

Note that the RHS of (38) is $(R_O, e, 0)$ and the RHS of (40) is $(R_F, 2e-1, l)$. Following similar steps as for $\psi(\cdot)$ in Lemma 7, it can be verified that $\partial \psi / \partial R_F < 0$ and $\partial \psi / \partial R_F < 0$. Since $2e-1 \leq e$ and $R_F \leq R_O$ (with strict inequalities when $e < 1$), these effects imply that (40) is tighter than (38), making A less likely to take the risky project under family finance. As regards l , note that it appears with the same coefficient in the arguments of *all* utility terms in (39), i.e., as $-(1-e)l$. So, variation in l is a wealth effect. If A has decreasing absolute risk aversion (e.g., $u''' > 0$), this would be another channel through which family finance reduces risk taking, since it reduces A 's "paternalistic" wealth.

To see that social risk aversion is at play, consider $R_F = R_O = R$ and $qR = \bar{R}$. The first assumption makes A indifferent between the two projects if she considers only her *selfish* payoff. The second assumption implies that F 's *expected* paternalistic payoff is always eqR , which makes him indifferent between the two projects as he is risk neutral. So, A bears no cash flow risk under either type of finance, nor does she reduce F 's expected utility by taking the risky project; both of these channels

are mute here. Nevertheless, given these parameters, the risk taking constraint (both in Case 1 and in Case 2) becomes

$$qu_A((1-e)W) + (1-q)u_A((1-e)W) \geq u_A((1-e)W)$$

for outside finance and

$$qu_A((1-e)(W-l+R)) + (1-q)u_A((1-e)(W-l)) \geq u_A((1-e)(W-l+\bar{R}))$$

for family finance. Under outside finance, A is indifferent between the two projects. Under family finance, she strictly prefers the safe project due to Jensen's inequality and the fact that she internalizes F's material payoff with intensity $1-e$.

Proposition 9

Most of the proof is in the text. It remains to be shown that A can be excessively conservative under family finance also when $\bar{R} < R_F$. Suppose first that (19) holds. Then, A always repays F, if necessary through favors. Under the safe project, this means that A partly repays F with cash and makes up for the shortfall through favors. A then chooses the risky project if and only if

$$q[R - R_F + \bar{\alpha}(W - l + R_F)] + (1-q)[\bar{\alpha}(W - l + R_F) - cR_F] \geq \bar{\alpha}(W - l + R_F) - c(R_F - \bar{R}),$$

which simplifies to

$$q \geq \frac{c\bar{R}}{R + (c-1)R_F}.$$

It is straightforward to show that RHS is larger than \bar{R}/R as long as $R > R_F$, which holds here by assumption and, more generally, is violated if and only if A *always* defaults under either project. So, for $R > R_F$, A exhibits excessive conservatism.

Now assume that (19) does not hold, but the weaker inequality

$$(c - \bar{\alpha})R_F - (c - 1)\bar{R} \leq \bar{\alpha} \frac{1}{1+} (W - l)$$

holds, where the RHS equals $(1 - \bar{\alpha})\bar{R} + (c - \bar{\alpha})(R_F - \bar{R})$. In this case, A is willing to repay F under the safe project – partly in cash and partly through favors – but unwilling to pay F through favors when the risky project fails. She then chooses the risky project if and only if

$$q[R - R_F + \bar{\alpha}(W - l + R_F)] + (1-q)\frac{\bar{\alpha}}{1+}(W - l) \geq \bar{\alpha}(W - l + R_F) - c(R_F - \bar{R}),$$

which simplifies to

$$q \geq \frac{c(\bar{R} - R_F) + \bar{\alpha}[R_F + \frac{\lambda}{1+\lambda}(W - l)]}{R - R_F + \bar{\alpha}[R_F + \frac{\lambda}{1+\lambda}(W - l)]}.$$

First, note that $\bar{R} - R_F < 0 < R - R_F$ in this case. Still, If $\bar{\alpha}[R_F + \frac{\lambda}{1+\lambda}(W - l)]$ is sufficiently large, the RHS can be larger than $\hat{\alpha}(R_F)$, in which case this inequality is tighter than under outside finance, and possibly even larger than \bar{R}/R , in which case A is excessively conservative.

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