Financing from Family and Friends*

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Abstract

Financing from family and friends is the predominant type of informal finance. This paper proposes a theory that reconciles two seemingly paradoxical traits of this form of finance, namely, it is often provided at negative prices but nevertheless eschewed by borrowers. A central prediction is that such finance, while breeding trust, deters risk taking. Demand is thus constrained: entrepreneurs may forgo risky investment rather than finance it through family and friends. Formal finance is valuable precisely because it is regulated only by contract. The highlighted trade-offs between formal and informal finance are potentially relevant for the provision of microventure capital.

Keywords: Informal finance, family loans, peer-to-peer lending, small business lending, entrepreneurial finance, microfinance, missing middle, financing gap, risk capital, social ties, altruism, social collateral

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Neither a borrower nor a lender be;

For loan oft loses both itself and friend.

— Hamlet, Act I, Scene 3

1 Introduction

Many policymakers believe that micro, small, and medium-sized enterprises (MSMEs), which are the backbone of most economies, have inadequate access to formal finance.[1] This financing gap is believed to contribute to the top and bottom heavy firm size distribution in developing countries, the so-called "missing middle" (International Finance Corporation (2009)). It has also led to widespread efforts to expand access to formal finance.

While lacking formal finance, smaller firms tap into informal finance. A study of 42 countries by the Global Entrepreneurship Monitor (GEM)[2] estimates that, in 2006, several million companies received $600 billion from 208 million informal investors (Bygrave and Quill (2006)).[3] Thus informal finance somehow overcomes the frictions that impede formal finance. This raises a natural question: can informal finance not close the financing gap? The common view is that informal investors do not have sufficient funds or, for this and other reasons, require very high returns. In short, supply is limited or costly.[4]

[1] According to the Organization of Economic Cooperation and Development (OECD, 2006), MSMEs are the dominant form of business, accounting for over 95% and up to 99% of enterprises depending on the country, and for 60 to 70 percent of net job creation in OECD countries.

[2] The GEM is the largest ongoing study of entrepreneurship in the world.

[3] By 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).

[4] Existing theory reflects this view (see Section 2.1). Models of informal finance typically assume that informal investors have some technological advantage – such as superior information, cheaper monitoring, or stricter enforcement – in mitigating moral hazard or adverse selection. Models that feature a choice between

This paper argues that demand for informal finance is constrained as well. The supply-side story seems accurate in the case of informal moneylenders, who typically charge enormous interest rates. But it is at odds with aspects that commonly characterize financing from family and friends—or short, family finance—which constitutes the bulk of informal finance.[5] To begin with, family finance is cheap. In fact, it often has a negative price. As a Wall Street Journal (2012) guide writes, many startups turn to "the Bank of Mom or Dad" for a "dream-come-true interest rate." Indeed, half of all informal investors in the GEM study expect zero or negative returns (Bygrave, 2004: 17), and family loans among the poor are predominantly interest-free (Collins et al., 2010: Chapter 2). Family finance, it would seem, should therefore be a first resort.

But paradoxically, it is not. Borrowers frequently eschew family finance even when it is cheap. Many poor households state that they dislike borrowing from family and friends, or that they borrow elsewhere whenever they can (Collins et al., 2010: 54f). In the GEM study, the largest informal investments involve strangers, not relatives or friends, despite the fact that the investor's required return rises with her social distance to the entrepreneur. As the most likely reason, the study does not cite limited supply of family funds but rather that "investments in strangers are made in a more detached and business-like manner than investments in relatives and friends" (Bygrave, 2004: 17). Tellingly, 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).

formal and informal finance usually assume, in addition, that informal investors are wealth-constrained or must be compensated for higher costs, thus creating a trade-off that can explain the coexistence of informal and formal finance.

[5]The GEM study finds that about four out of five informal investors are either relatives or friends of the entrepreneur (Bygrave and Quill, 2006: 12). For developing economies, the conclusion that most financial activity occurs among friends and relatives was already drawn in the 1989 World Development Report (World Bank, 1989: 112).

This poses basic questions. Why is family finance so prevalent? Why does it come at giveaway prices? Why are borrowers nevertheless averse to it? What, if so, is the constraint on family finance? Building on a moral hazard model of constrained lending similar to Holmstrom and Tirole (1997), this paper argues that a *single* aspect of family finance offers a coherent answer to all these questions: relatives or friends are linked by altruism. Clearly, altruism can explain how family finance overcomes contracting frictions and why family investors may accept negative returns. But it can also explain why a borrower may dislike family finance. The borrower may be averse to imposing risk on family and friends, and more, afraid of repercussions on his relationships to them. Since such concerns increase with risk, family finance deters the borrower from taking chances, especially large ones. This, then, curtails the usefulness of family finance for entrepreneurial risk-taking and growth, and hence its potential to close the financing gap. In other words, altruism, the very bond that makes family finance a good source of *trust capital*, also makes it a bad source of *risk capital*.

Whether the relevant constraint on family finance is only a lack of supply or, for the reasons above, also a lack of demand is not just an academic issue; it can matter for policy. For example, it could inform the design of micro venture capital programs in developing countries. If our arguments are correct, a micro venture capitalist who wants to harness the power of social relations must take into account that this can endanger those relations and mute the entrepreneur's incentive to take risks. The challenge is then to design a program that taps the trust embedded in social relations while minimizing the risk imposed on them. Interestingly, there are firms in *developed* economies that cite this as their motivation for *intermediating* loans between relatives or friends. These intermediaries build on ideas that could also work for microventure capital funds (see Section 6.1).

As mentioned, our analysis focuses on altruism between relatives or friends as the key distinction between family finance and formal finance. For simplicity we assume no other differences (for example, in wealth, cost, or information). Notwithstanding, the model produces a number of predictions, each and every one of which results from the single distinction:

(1) *Coexistence*: Borrowers use family and formal finance. Some borrowers use both sources of finance simultaneously.

(2) *Negative price*: Family lenders may accept negative returns.

(3) *Pecking order*: Despite being cheap, family finance is the last resort.

(4) *Risk-taking*: Family finance discourages risk-taking.

(5) *Certification*: Family finance helps raise formal finance.

(6) *Deepening*: Family finance can be indispensable for projects with severe agency problems. Formal finance can be indispensable for risky projects.

(7) *Size constraint*: Family finance limits firm size.

The basic friction in the workhorse model we build on is that the entrepreneur may reduce his probability of success in order to enjoy a private benefit. For him not to do so, he must keep a sufficiently large financial stake in the project. But this limits his pledgeable income, that is, he can pledge only up to a certain part of the cash flow to a lender without losing his incentive to properly manage the project. When his pledgeable income is smaller than the repayment required by the lender, financing is infeasible—the entrepreneur is capital-constrained.

We consider two ways in which altruistic ties can influence the borrowing relationship, one in which the altruism is invariant throughout, and another in which the altruism can

be affected by decisions of the entrepreneur. The two scenarios expose different mechanisms but yield the same main conclusions.

The first scenario focuses on the fact that close relatives and friends partly internalize each other's wellbeing. This has several effects. First, the family lender may accept a repayment below her breakeven level because she enjoys helping the entrepreneur. Second, the entrepreneur is less prone to consume the private benefit because he dislikes harming the family lender. This increases pledgeable income. Third, the entrepreneur dislikes the risk he imposes on the family lender. The first two effects—which relax the lender's participation constraint and the entrepreneur's incentive-compatibility constraint—make it more likely that the pledgeable income exceeds the required repayment; that is, they relax the capital constraint. The third effect—which tightens the entrepreneur's participation constraint—makes family finance unattractive in terms of risk sharing, since the entrepreneur retains risk exposure through his altruism. Thus, in this scenario, family finance manifests a "social" version of a classic trade-off: it improves incentives at the expense of risk sharing.

The second scenario focuses on the fact that altruistic relationships are valuable beyond being a source of finance, and that a financial transaction may put this value at risk. While a financial default per se need not harm the relationship, it may create social obligations, that is, expectations on part of the family lender that the borrower will somehow make up for the loss, or one day return the favor. If the lender is denied such favors, the relationship may suffer. Thus the leniency, or flexibility, of family loans may be a false impression: it is hard to shake off family "debt." In other words, family loans seldom come with limited liability. This has again several effects. First, the observable returns to family loans can be negative, because of altruism and unobservable means of compensation. Second, a delinquent entrepreneur faces social frictions—he owes the family lender, possibly costly, favors or he

risks making her indignant by denying her such favors. Third, the absence of limited liability and the threat of social frictions make default less appealing and hence reduce the moral hazard problem; the entrepreneur is less prone to consume the private benefit. In this scenario family finance embodies another classic trade-off: it improves ex ante incentives at the risk of ex post frictions.[6]

The logic common to both scenarios is that, despite being "cheap," family borrowing is a costly commitment device. Because of these costs, entrepreneurs prefer only formal finance unless the additional commitment of family finance is necessary. The costs can even be so high that the entrepreneur rather forgoes a risky project than finance it through family and friends, especially if the risk is large. This basic logic underlies predictions (1) to (7) mentioned above.

If our portrayal of family finance is accurate, it also sheds a different light on the strengths of formal finance. The promise of formal finance is then not just an increase in the supply of loanable funds. Formality creates two distinct advantages over family finance: it channels risk out of the borrower's social sphere and it is immune to the threat of social frictions.[7] Both of these advantages imply that formal finance is better than family finance for borrowers who seek to fund risky investments, such as those with entrepreneurial ambitions. This, if true, suggests that it may be worthwhile thinking about loan designs that combine social incentives and formality in potentially more effective ways.

Anecdotal evidence suggests that the concerns outlined in our theory of family finance are salient in reality. For example, the following advice echoes the kind of altruistic concern that is key to the first scenario:

[6]This raises the question why the frictions are not negotiated away ex post. Section 6.2 discusses this issue and how it relates to commitment.

[7]A more fundamental interpretation of the second point is that liabilities governed by contract, as opposed to emotions or norms, can be designed more flexibly. Section 6.2 discusses this point in more detail.

> 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.[8]

Similarly, the next advice mentions the kinds of social frictions that are key to the second scenario:

> The borrower becomes a servant to the lender (Proverbs 22:7). This is exactly how I felt when I borrowed money. 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.[9]

Such advice is the rule rather than the exception—which suggests that these issues are of first-order importance to family finance. Last but not least, Collins et al. (2010: 55) document that such concerns indeed reduce the *demand* for family finance:

> 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

[8] See http://moneyning.com/money-beliefs/5-times-you-shouldnt-take-money-from-family, retrieved 16 May 2012.

[9] See http://www.moneycrashers.com/why-you-should-not-lend-money-to-friends-and-family, retrieved 16 May 2012.

employer) before they would resort to relatives. Sultan the carpenter 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. If he took a loan from them and wasn't able to repay it, he might lose the social relationship with them, which he valued greatly.

2 Related literature

2.1 Theoretical literature

There is a well-established theoretical literature on the role of social ties in financial contracting. One strand focuses on information advantages: Lower monitoring costs or superior information on the part of social lenders reduce moral hazard (Stiglitz, 1990; Varian, 1990; Banerjee et al. ,1994; Jain, 1999), costly state verification (Mookherjee and Png, 1989; Prescott, 1997; Gine, 2011), and adverse selection (Ghatak, 1999). We abstract from such information benefits in order to focus on the effects of altruism. In fact, Section 5 assumes the opposite, namely that *formal* lenders rely on monitoring whereas family lenders rely (only) on altruism.

Another strand, which our second model belongs to, argues that social ties—through the threat of social sanctions in case of default—help enforce repayment. Besley and Coate (1995) start with a given group of borrowers and show that a repayment game can be designed such that social sanctions, modeled as a cost to a defaulting borrower, help exact repayment. Besley et al. (1993) study similar disciplinary benefits of peer pressure. In a recent paper, Karlan et al. (2009) embed such effects in a social network model where social ties serve as

social collateral, and show how the network structure influences transactions.

While focusing on how social ties facilitate lending, these papers pay less attention to the downside of social enforcement. 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," citing real-world examples from Montgomery et al. (1996) where the reliance on social relations for enforcement damaged those relations ex post and even provoked violence. It is, among other things, such negative implications of family finance that the present paper focuses on.

Another related literature focuses on family firms. Early influential work in this literature models the family as a unified entity. In Burkart et al. (2003), family ownership mitigates conflicts between managers and outside shareholders but creates conflicts between the family and other stakeholders. In Almeida and Wolfenzon (2007), families use pyramidal business groups to fund new investments when external finance is difficult to obtain due to agency problems. These papers parsimoniously model the fact that certain frictions that impede transactions between strangers are mitigated within the family, but treat the family as a "black box." Recently, there have been attempts to study governance issues in settings where family members do not necessarily act in unison (Lee and Persson, 2011; Noe, 2011).

The broader literature on family economics starts with Becker's (1973) *unitary* model of the household, which treats the family as a single decision maker. Empirical evidence against a key prediction of this model—namely, that a family's expenditure decisions are independent of whom income is endowed upon—has led 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). While stressing family conflicts, the collective model assumes nonetheless that the household always achieves Pareto efficiency. The

efficiency assumption has been challenged empirically (e.g., Udry, 1996; Duflo and Udry, 2004; Ashraf, 2009; Ashraf et al., 2010); and Schaner, 2012), and several studies propose alternative household models in which intrafamily conflicts entail inefficiencies (e.g., Konrad and Lommerud, 1995; Lundberg and Pollak, 2003; Basu, 2006; and Hertzberg, 2012).

Although we also posit that social relations can lead to inefficient outcomes, the perspective is rather different: In the first scenario, the Achilles heel is the empathy, not the conflict, between family members; in the second scenario, family transactions are problematic not because existing conflicts distort decisions, but because the decisions can create conflict.

2.2 Empirical literature

We are not aware of empirical studies that explicitly test the trade-offs discussed in this paper. However, there are observations in various empirical studies that speak to some of our main points.

First, there is evidence that (the success or failure of) financial transactions can affect social relationships. In the context of group lending, Karlan (2007) reports direct evidence that the relationships between group members deteriorate after default. Complementing this finding, Feigenberg et al. (2010) document that group lending can improve social relations among group members, notwithstanding—we presume—that joint-liability defaults could still harm these relations.

Second, recent studies indicate that social preferences can create "social risk aversion." Saidi (2010) reports evidence suggesting that funding based on social relations leads to less risky investments. In an experimental study on delegated risk-taking, Andersson et al. (2012) show that pro-social preferences decrease a subject's inclination to take risks on behalf of

others.

Third, there is some empirical indication that, consistent with anecdotal evidence, entrepreneurs may prefer formal over family finance. 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. 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, bank finance *replaces* informal finance. This is consistent with our theoretical conclusion that, though entrepreneurs may sometimes have to rely on family finance, they prefer formal finance, sometimes even requiring it, when funding risky investments.

Finally, several empirical studies on family firms discuss more generally 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 that are consistent with the idea that "family values" can negatively affect firm value, while the evidence in Bertrand et al. (2008) strongly suggests that conflicts between multiple heirs damage family firms. An interesting conjecture in Schulze et al. (2001), which is opposite to the focus in this paper, is that altruistic ties between family members may soften, rather than strengthen, discipline.[10]

[10] Alger and Weibull (2010) theoretically confirm a similar conjecture in a different setting by showing that altruism can have non-monotonic effects on *ex ante* incentives because of the incentives to help each other out *ex post*.

3 Social risk

3.1 Model setup

Our basic framework is a variation of the widely used model of Holmstrom and Tirole (1997). A penniless entrepreneur, A, has a project idea. The project requires a fixed investment $I > 0$ at time 0. If undertaken, it will yield a verifiable cash flow at time 1, which equals $R > 0$ (success) with probability q and 0 (failure) otherwise.

A can seek funds from two investors: Investor F is a friend or relative. Investor O is an outsider who has no social relationship with A. Other than that, the two investors are identical: risk neutral, equally (un)informed, and endowed with the same wealth $W \geq qR$.[11] Both only demand to break even, and everyone discounts time at rate 0.

A financial contract promises agent $i \in \{A, F, O\}$ a repayment $R_i \geq 0$ in the event of success, where $\sum_{i\in\{A,F,O\}} R_i = R$. So, if O invests I_O, her breakeven condition is $qR_O = I_O$. We sometimes use $\mathbf{R} \equiv (R_A, R_F, R_O)$ for convenience.

A is subject to moral hazard. While running the project, he can consume private benefits in the amount B also with probability q.[12] Private benefit extraction comes at the expense of cash flows reducing them, for simplicity, to 0. We make the following parametric assumption.

A1. $qR > \max\{I, qB\}$.

This assumption states that the expected cash flow from a well-run project exceeds both the investment cost and expected private benefits.

[11] The assumption of risk-neutrality is not crucial. See footnote 13 and Section 6.3.

[12] We assume that private benefits are uncertain so as to avoid that they are more attractive simply because they are safer. This is for convenience and not crucial for the results.

A is risk averse. We model his risk aversion through simple mean-variance preferences:

$$E[U_A(\pi_A^s)] = E(\pi_A^s) - \rho Var(\pi_A^s),$$

where the parameter $\rho > 0$ gauges his risk aversion.

The key aspect of this otherwise standard model is the social relation between A and F. We model their relationship as mutual altruism. Specifically, we assume that their altruistic payoffs are

$$\pi_i^s = \pi_i + \phi\pi_{j\neq i} \qquad \text{for } i \in \{A, F\},$$

where $\phi \in (0, 1)$ is the degree of altruism.[13]

3.2 Social risk aversion

It is instructive to first compare the two sources of finance in the absence of moral hazard, since this allows us to isolate the facet of altruism that is central to our main insights.

Let us begin with funding from only O. Suppose A pledges the entire cash flow to O, that is, $R_O = R$. For this, O pays A the amount qR at time 0. A's expected utility $E[U_A(\pi_A^s)|\mathbf{R}]$ is then

$$E[U_A(\pi_A^s)|0, 0, R] = qR - I + \phi W, \tag{1}$$

where qR is cash received from O and ϕW is A's utility from internalizing F's payoff. Note that the risk is optimally allocated; it is fully borne by the risk neutral party, O.

Let us now bring in F, who is risk-neutral like O. Suppose A pledges some cash flow

[13] We model altruism in terms of payoffs as opposed to utilities out of convenience. Intuitively, in this case, A may worry over F even if F is not worried herself. This modeling choice is not crucial for the results; as we discuss in Section 6.3, we could alternatively assume that A and F internalize each other's utilities, which yields similar results so long as F is risk averse.

to F, that is, $R_F \in (0, R]$. For this, F pays A the amount I_F that meets her breakeven constraint:

$$W - I_F + qR_F + \phi\,(I_F + qR_O - I) = W + \phi\,(qR - I)\,. \tag{2}$$

The left-hand side of (2) is F's expected utility if she provides funds; $W - I_F$ is residual cash, qR_F is expected cash flow from the project, and $\phi(I_F + qR_O - I)$ is the utility from internalizing A's payoff. The right-hand side of (2) is F's expected utility if the funding is left entirely to O; F keeps all her cash W and enjoys utility ϕqR from internalizing A's payoff. This yields

$$I_F = qR_F. \tag{3}$$

A's expected utility is $E[U_A(\pi_A^s)|0, R_F, R_O] = qR_O + I_F - I + \phi\,(W - I_F + qR_F) - \rho q(1 - q)\phi^2 R_F^2$, which by way of (3) collapses to

$$E[U_A(\pi_A^s)|0, R_F, R_O] = qR - I + \phi W - \rho q(1 - q)\phi^2 R_F^2, \tag{4}$$

where qR is the total cash from F and O, ϕW is the utility from internalizing F's expected payoff, and $-\rho q(1 - q)\phi^2 R_F^2$ is the disutility from internalizing F's risk.

Comparing (4) and (1) leads to our first result.

Lemma 1. *Absent private benefit consumption, A is financed only by O.*

Key to Lemma 1 is the last term in (4), $-\rho q(1 - q)\phi^2 R_F^2$, which embodies the cost of a financial contract between A and F, with $q(1 - q)R_F^2$ being the risk A transfers to F. Since A and F are friends, A internalizes this risk with intensity ϕ^2, and since he dislikes risk with intensity ρ, he experiences disutility from shifting risk to F. He feels no such disutility when transferring risk to O, to whom he is indifferent.

In common language, the disutility means that A *worries* about F. Thus, from A's point of view, selling the project to F is an imperfect risk transfer: He still worries about the outcome. This intuition also shines through in the comparative statics.

Corollary 1. *A's preference for funding from O increases with ρ, ϕ, and $q(1-q)R_F^2$.*

A finds financing from F less attractive, the greater his risk aversion ρ, the stronger his altruism ϕ toward F, and the larger the project risk $q(1-q)R_F^2$.

It may seem surprising that ϕ has no countervailing positive effect, for two reasons. First, F requires breaking even in monetary terms—just like O—but one might have thought her willing to provide funds at (more) attractive terms since she cares for A. This would be true if A were to forgo the project without funding from F, but here A can realize the project without F, who is happy for A even if she is not involved.

Second, one might have thought that A would prefer to "share" the project with a friend rather than a stranger, due to the altruistic utility. Indeed, if A had to give away profits, he would rather give them to F. But here A enters into a *quid pro quo*. As much as he would enjoy giving F the expected cash flow qR_F, he would dislike reducing her cash by $I_F = qR_F$. These effects cancel each other, and what remains is that A imposes risk on F.

3.3 Social incentives and risk aversion

Once there is moral hazard, A may be unable to fund the project solely through O and may have to raise capital from F. First, consider A's expected utility

$$E[U_A(\pi_A^s)|\mathbf{R}] = qR - I + \phi W - \rho q(1-q)\left(R_A + \phi R_F\right)^2 \tag{5}$$

for a general claim structure $\mathbf{R}$ when the project is run well. This equals his expected utility under the first-best outcome (1) minus $\rho q(1-q)\left(R_A - \phi R_F\right)^2$, his disutility from exposure to risk both directly and indirectly through F. Clearly, A would like to increase R_O, that is, transfer (more) risk to O. However, this would also increase his incentives to consume private benefits.

This brings us to A's incentive compatibility constraint,

$$q\left(R_A + \phi R_F\right) - \rho q(1-q)\left(R_A + \phi R_F\right)^2 \geq qB - \rho q(1-q)B^2. \tag{6}$$

The left-hand side of (6) is A's expected utility from a well-run project; it comprises utility from his own and $F's$ expected cash flow, $q\left(R_A + \phi R_F\right)$, and disutility from his own and F's exposure to risk, $-\rho q(1-q)\left(R_A + \phi R_F\right)^2$. The right-hand side of (6) shows his expected utility if he decides to consume private benefits.

Since A wants to maximize R_O, he chooses R_A and R_F just large enough for (6) to be binding. The resulting quadratic equation yields

$$R_A + \phi R_F = B. \tag{7}$$

A larger R_F relaxes A's incentive compatibility constraint inasmuch as it allows him to retain a smaller R_A. This is the incentive benefit of financing from F relative to financing from O.

To determine whether A would rather sell risk to F than retain it, we plug (7) into (5), which consequently collapses to

$$E[U_A(\pi_A^s)|R_A, 0, B - R_A] = qR - I + \phi W - \rho q(1-q)B^2. \tag{8}$$

Strikingly, this implies that A does not care whether the incentive compatibility constraint is met by allocating risk to himself or to F. We see in (7) that R_F is an imperfect substitute for R_A in that a one-dollar claim given up by A requires a $1/\phi$-dollar claim taken up by F to preserve A's incentives. Intuitively, since A cares less about risk borne by F than by himself, commensurately more risk needs to be borne by F to equally motivate A. Thus, one way or another, A internalizes the same amount of risk to have proper incentives.

We can compare the situation represented by (8) with A's situation in the absence of O to assess the latter's importance for project funding. Absent O, the project is forgone unless F funds it fully. Assuming $I_F \geq I$, F's breakeven constraint then becomes

$$W - I_F + qR_F + \phi\left[I_F - I + q(R - R_F)\right] = W \tag{9}$$

which yields $qR_F = \frac{I_F - \phi(I_F - I + qR)}{1-\phi}$. It is straightforward to verify that this is smaller than I_F, which means that F is willing to accept a negative return when she is pivotal for realizing the project. The reason is that she partly internalizes benefits accruing to A *that would not materialize without her funding*; she likes to help A out. The lower "cost of capital"—lower R_F and hence larger $R_A = R - R_F$—further relaxes A's incentive-compatibility constraint. In spite of this, formal finance may be indispensable for A to undertake the project.

Proposition 1. *There exist projects that A only undertakes if O is present.*

Proof. If only F is present, the upper bound on A's expected utility is $Z \equiv (1+\phi)(qR - I) + \phi W - \rho q(1-q)\phi^2 R^2$. This is his expected utility when transferring all the risk to F, which he may not be able to do for incentive reasons. By contrast, if O is also present, A may be able to fund the project with the help of F and O, in which case his utility is given by (8) where $B < R$; let Z' denote this utility. There exist parameters consistent with **A1** such that

$Z < 0 < Z'$ (e.g., choose $\rho q(1-q)R^2$ large enough so that $Z < 0$, and then let $B \to 0$). □

As spotlighted by Lemma 1, A dislikes exposing not only himself but also F to risk. In the absence O, A may hence prefer forgoing the project over putting the risk on himself or F, even though F is willing to accept a negative expected return, that is, subsidize the project. By contrast, once O is present, A may dare undertake the project since some risk can be put outside of his social sphere by funding it through O.

At the same time, not all projects can be funded solely through O. In the absence of F, A needs to retain a claim $R_A = B$ to satisfy the incentive compatibility constraint (see (7)). However, the residual claim $R_O = R - B$ may be too small to raise the required outlay I.

Proposition 2. *There exist projects that A only undertakes if F is present.*

Proof. Absent F, A can finance the project if and only if $q(R-B) \geq I$, or $qR \geq I + qB$. Clearly, there are parameters consistent with **A1** that violate this condition. If the condition is violated, F is necessary to fund at least part of the project. Now suppose F is also present. F's participation constraint is then $W-(1+\phi)\,I_F+qR_F+\phi\,(qR_O-I) = W$. Compared with (2), the only difference is that the right-hand side is smaller; thus, the break-even rate I_F is larger than in the case of (2): $I_F = qR_F+\varepsilon$ where $\varepsilon > 0$. From O and F together, A can hence raise $qR_F+\varepsilon+q\,(R-R_F-R_A)$. After substituting for R_A using the incentive-compatibility constraint (7), this becomes $qR_F+\varepsilon+q\,(R-R_F-(B-\phi R_F)) = \varepsilon+q\,(R-B+\phi R_F) > q(R-B)$. □

The intuition is that A may be unable to obtain enough capital from O without losing the incentive to run the project well. In comparison, selling claims to F also yields capital but reduces A's incentives less. That is, A can sell more claims—or "pledge more income"—to F than to O without destroying his incentives. Furthermore, when F is pivotal, she is willing

to provide funds below the breakeven rate, making it even easier for A to raise the necessary funds. As a result, there are projects he can finance only with F's participation.

Taken together, Propositions 1 and 2 state that formal finance (funding from O) and family finance (funding from F) both promote financial deepening, that is, expand the capital market. The reason is that they relax two different constraints: The former facilitates investment when risk aversion sets the binding constraint, whereas the latter fulfills that role when incentives set the binding constraint. In a nutshell, formal finance is a source of *risk capital*, whereas family finance is a source of *trust capital*.

A simple way to understand this result is to view it as a permutation of the classic trade-off between risk sharing and incentive provision, but with a social twist. Family finance is better for incentives but worse for risk sharing than formal finance. The optimal contract taps both sources for the right balance between risk sharing and incentives.

Proposition 3. *If the project is funded, A sells only so much cash flow to F that his incentive compatibility constraint binds and sells the remaining cash flow to O.*

Proof. First, consider funding the project without O. This is possible if there exists some $\mathbf{R} = (R_A, R - R_A, 0)$ such that the incentive compatibility constraint $R_A + \phi\,(R - R_A) \geq B$ is satisfied. If no such capital structure exists, the project cannot be funded due to incentive reasons; selling claims to O would but weaken incentives further. If such a capital structure exists and the constraint binds, the project is fully funded by F for $Z > 0$, and abandoned otherwise (Z is defined in the proof of Proposition 1). If the constraint is slack, A can raise his expected utility by selling claims to O until the constraint binds. He undertakes the project, at that point, with funding from O and F if and only if his expected utility is positive. □

Recall that A, eager to shed risk, wants to raise funding only from O but may not be able to due to moral hazard. He must then raise some funding through F to preserve his incentives but, conditional thereupon, still sells as much cash flow as possible to O. That is, A uses family finance as a commitment device, but only to the extent necessary since it is costly in terms of risk sharing. With a more continuous choice on the part of A, there would also be a more continuous trade-off between more risk sharing and better incentives.

Note that the two sources of finance can be complementary in that one may not be used without the other: A may not ask F for funding unless he can shift some risk to O; conversely, A may not receive funding from O without funding from F. This second point is, in a more nuanced way, also reflected in the next result.

Corollary 2. *If the project is funded by O and F, R_O* increases in ϕ.

Proof. For larger ϕ, the incentive compatibility constraint $R_A + \phi R_F \geq B$ has more slack. A can then sell more risk to O, which he wants, without losing his incentives. □

Somewhat counterintuitively, closer ties to F make A raise more funding from O, since less funding from F suffices to obtain (more) funding from O. On the surface, variation in ϕ makes the two sources of finance appear like substitutes in our model. This is partly due to the binary nature of the actions. The complementarity would be more apparent in a model with a choice of project size or a continuous choice of private benefits, where a larger ϕ could lead to more formal finance *and* family finance.

4 Social debt

4.1 Model setup

We cast our second model in the same framework with but a few modifications. First, we dispense with risk aversion to throw out the channel studied above. A is now, like F and O, risk neutral.

Instead, we extend the timeline to capture the following idea: There exists a reciprocity norm between A and F such that if A defaults on a loan from F, F expects favors from A. Such favors can include many things from mowing lawns, running errands, organizing or attending social events, repaying the "old debt" instead of taking a fancy trip, to giving a loan in return. If A refuses such favors, F is indignant, and their relationship suffers.

More specifically, we add a time 2 at which A can pay F a favor. The favor imposes a cost C on A and confers a benefit G on F. If A defaults *and* declines F the favor, then ϕ drops to 0. We make the following parametric assumption:

A2. $C = aG > G = R_F > \phi C$.

This assumption says two things: First, effects on the relationship aside, the favor is inefficient (since $C > G$) but attractive to F (since $G > \phi C$). Thus, the favor will not be paid absent a default, but when paid, will benefit F. Second, larger defaults call for commensurately larger favors ($G = R_F$).

Crucially, we assume that decisions on future favors are non-contractible and that damages to relations can occur even when they are ex post inefficient. We have in mind that relatives or friends tend to base entitlements on personal promises rather than the letter of the contract, and that a willful breach of such promises evokes emotional reactions, such as disappointment or indignation, that are impossible to contract (away). We will return to

these assumptions in Section 6.2 to discuss their importance and back them with insights from social psychology.

4.2 Social frictions

Again, to clarify the forces at work, we first abstract from private benefit consumption, which allows us to focus on repercussions for "life after the project." In this setting, we start with an informal contract between A and F and discuss the effects of introducing formal contracts and O. So, as a starting point, suppose there are no formal contracts; that is, there is no legal enforcement. In this case, O would not be repaid and hence refuses to finance A. However, F may still supply funds since she may be able to rely on social incentives for repayment.

These incentives stem from the threat of losing F as a friend if A can repay F but refuses. Note that A prefers paying F in money to paying favors because the favors are costlier ($C > R_F$). Hence, if A refuses to repay the loan in money, he will a fortiori refuse to pay the favor. Suppose A has the money to repay F. He does so if and only if

$$\phi(W - I + R_F) \geq R_F, \tag{10}$$

that is, if the relationship is worth more to him than the money he gives up. In other words, he repays F if his social collateral $\phi(W - I + R_F)$ is sufficiently valuable.[14] If (10) is violated, F will not fund the project; she would lose money as well as a friend. This is, for example, the case when $W - I \to 0$. Importantly, the looming loss of friendship can be *pivotal*, since there are cases in which a mere loss of money would not be reason enough for F to deny

[14] Repayment hinges on the fragility of the friendship. Fixed altruism cannot exact repayment for $\phi < 1$.

funding.[15] This is one example—others will follow—of the central insight of this model: The threat of social frictions deters financial transactions between friends.

With this thought in mind, let us introduce formal contracts. Under a formal contract, A repays F at time 1, if he can, even when (10) is violated. But this does not imply that he always can. Nor does it imply that, in case of default, he would pay F the favor, since even if (10) holds, the inequality

$$\phi(W - I + R_F) \geq C \tag{11}$$

need not hold given that $C > R_F$. Thus, there are two cases. First, suppose (11) is violated. F's breakeven constraint is then

$$W - I + q\left[R'_F + \phi\left(R - R'_F\right)\right] + (1 - q)\,0 = W, \tag{12}$$

which yields $R'_F = \frac{I/q - \phi R}{1-\phi}$. It is straightforward to verify that this is smaller than I/q, which means that F is willing to accept a negative interest rate out of altruism. Now, suppose (11) holds. In which case, A will pay F the favor after a default, so F's breakeven constraint is

$$W - I + q\left[R''_F + \phi\left(R - R''_F\right)\right] + (1 - q)\left(G - \phi C\right) = W \tag{13}$$

and yields $R''_F = \frac{I - q\phi R}{q(1-\phi)+(1-q)(1-\phi a)}$. Since the favor is de facto a deferred payment that F receives in case of default, we have $R''_F < R_F$. That is, F is willing to accept, at least nominally, an even more negative financial return in this case.

Formality helps not only enforce monetary transfers but also prevent social frictions. More specifically, when (10) is violated, a formal contract reduces the probability of so-

[15] If the relationship is invariant, F's participation constraint is $W \leq W - I + \phi qR$, simplifying to $I \leq \phi qR$. That is, F will still provide funding as long as she values the gain to A more than her monetary loss.

cial frictions by q. But it cannot eliminate them completely. With probability $1-q$, A will still have to pay F favors, or else damage the relationship; and due to these social frictions, A might still forgo the project. If (11) is violated, A's expected gain is $q\left[R - R'_F + \phi\left(W - I + R'_F\right)\right] - \phi W$, which can be written as

$$qR - I + q\phi(R - I) - (1-q)\phi W. \tag{14}$$

Otherwise, it is $q\left[R - R''_F + \phi\left(W - I + R''_F\right)\right] + (1-q)\left[\phi(W - I + G) - C\right] - \phi W$, which can be written as

$$qR - I - (1-q)(C - G). \tag{15}$$

Note that (14) is negative if A finds the threat of losing a friend, $(1-q)\phi W$, too costly. Similarly, (15) is negative if A deems the expected burden of future favors, $(1-q)(C-G)$, too large. These are further cases in which the threat of social frictions outweighs the monetary prospects.

Last but not least, let us introduce O. A formal contract with O is always feasible: A can raise I from O and repay $R_O = I/q$ if the project is successful. This satisfies O's breakeven constraint and A's participation constraint. Moreover, A's expected profit in this case, $qR - I$, is strictly larger than (14) or (15) because there is not threat of social frictions.

Lemma 2. *Absent private benefit consumption, A funds the entire project through O.*

The advantage of funding the project through O is that A neither risks a friendship nor fears future social obligations. In short, he sidesteps social frictions.

4.3 Social incentives and frictions

When private benefit consumption is possible, the contract must also preserve A's incentives to run the project well, whatever the funding source. Given this additional constraint, A can fund the entire project through O only if

$$qR \geq I + B. \tag{16}$$

When (16) is satisfied, any (efficient) project is financed.

As in our analysis of the social risk model, we can compare the situation represented by (16) with A's situation in the absence of formal contracting or O to assess the importance of (each of) the latter.

Proposition 4. *There exist projects that A only undertakes if formal contracts are available, and some that he only undertakes if O is present as well.*

Proof. Let (16) hold and (10) be violated. Without formal contracting, we show above that the project is not undertaken if (10) is violated. Now suppose formal contracting is available but O is still absent. Irrespective of (10), the project is then financed if A's participation constraint, either (14) or (15), is positive *and*, furthermore, his incentive compatibility constraint is satisfied. Depending on which case applies, the incentive compatibility constraint is either $q\left[R - R'_F + \phi\left(W - I + R'_F\right)\right] \geq B$ or $q\left[R - R''_F + \phi\left(W - I + R''_F\right)\right] + (1-q)[\phi(W - I + G) - C] \geq B + \phi(W - I + G) - C$. After substituting R'_F and R''_F, respectively, these two conditions can be rearranged to $qR \geq \frac{I+B-\phi(W-I)}{1+\phi}$ and $qR \geq \frac{I+B-q(C-\phi G)-(1-q)(G-\phi C)}{1+\phi}$, either of which is implied by (16) given A2. Now note that there exist parameters consistent with A1 and A2 such that (16) holds but (14) and (15) are negative. (To see this, let $(1-q)\phi W \to \infty$ and $(1-q)(C-G) \to \infty$.) For such parameters, F alone does not fund

the project even with formal contracting. Finally, introduce O. Given (16), all (efficient) projects are now financed. □

Proposition 4 adapts Lemma 2 to the setting with moral hazard: As long as A does not (have the incentives to) consume private benefits, it is efficient to finance the entire project through O. By contrast, financing from F can produce social frictions that formal contracting as well as the presence of O, an unrelated investor, help avoid.

Of course, (16) need not hold; when it is violated, O will refuse to finance the project (alone) due to moral hazard. Financing from F mitigates such incentive problems and can therefore be crucial to project funding in such cases.

Proposition 5. *There exist projects that A undertakes only if F is present.*

Proof. Let (11) hold but (16) be violated. In this case, A alone does not finance the project. However, F alone would finance the project if (15) is positive and the incentive compatibility constraint $qR \geq \frac{I+B-q(C-\phi G)-(1-q)(G-\phi C)}{1+\phi}$ holds. There are parameters consistent with A1 and A2 such that this incentive compatibility constraint and (11) hold, (15) is positive, and (16) is violated. (To see this, let $W \to \infty$ to satisfy (11), $qR - I - B \to 0^-$ to violate (16) but satisfy incentive compatibility, and $C - G \to 0$ to ensure that (15) is positive.) □

Proposition 5 highlights the fact that social frictions can improve matters. The threat of losing F's friendship, or social collateral, strengthens incentives via two channels. First, it exacts repayments formal contracts cannot enforce. This de facto reduces limited liability, thereby raising incentives and pledgeable income. Second, it increases A's incentives to succeed because a failure provokes social frictions, in the form of social obligations or damaged relations. In any case, it is precisely the cost of family finance—the threat of social frictions—that improves the ex ante incentives.

Propositions 4 and 5 exhibit parallels to Propositions 1 and 2 in Section 3. On one hand, formal finance facilitates investment by reducing risk, though here it is the risk of social frictions. On the other hand, family finance facilitates investment by improving incentives. Thus, again, formal finance is a source of risk capital, whereas family finance a source of trust capital.

This 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 commitment "today" at the risk of frictions "tomorrow;" in fact, the frictions engender the commitment. This trade-off sometimes has an interior solution: It can be optimal to use some but not only family finance to create the right incentives with minimal social frictions.

Proposition 6. *If the project is funded, it is optimal for A to sell cash flow to O as long as it reduces social frictions and the incentive compatibility constraint binds.*

Proof. Let I_F denote the amount raised from F. Note that the smaller I_F, the smaller is R_F. Condition (11) can then be written as $\phi(W - I_F) \geq (a - \phi)R_F$. This is less likely to be violated for smaller I_F and R_F, since $a > 1 \geq \phi$. Moreover, A's expected gain from financing the project when (11) is satisfied becomes $qR - I - (1 - q)(a - 1)R_F$, which is decreasing in R_F. Thus, A benefits from reducing I_F if it helps satisfy (11), or if (11) is already satisfied. If (11) cannot be met, then reducing I_F does not reduce social frictions, and hence does not benefit A. Last, when full financing from O is feasible, F's breakeven constraint yields either $R'_F = \frac{\phi(R - I_F/q) + I_F/q - \phi R}{1-\phi}$ or $R''_F = \frac{\phi(R - I_F/q) + I_F/q - (1-q)G'/q - \phi R}{1-\phi}$. In either case, it is straightforward to verify that A's expected gain from getting (partly) funded by F is then negative. □

This also means that A prefers to fund the project entirely through O if possible. Intuitively, when F is non-pivotal for financing the project, she offers neither favorable rates nor incentive benefits; at the same time, involving her would still bring about the risk of social frictions.

The ability to raise funding from F and O in tandem can be critical. When sole formal finance violates A's incentive compatibility constraint and sole family finance violates A's participation constraint, financing the project through both F and O can help simultaneously satisfy incentive compatibility and reduce the threat of social frictions to a level that is acceptable to A.

5 The "missing middle"

This section studies capital constraints that arise when entrepreneurs can request funding from either family and friends or formal banks that possess a costly technology to monitor borrowers. We then show how a combination of the two funding sources relaxes these capital constraints.

5.1 Distribution of projects and monitored finance

Consider a population of entrepreneurs that differ in the size $I \in (0, \infty)$ of their project (one can, e.g., think of them as entrepreneurs with different growth opportunities). A project of size I yields the expected cash flow $qR(I)$. We make the following assumption about technology.

A3. $R'(I) > 0$.

This assumption says that returns to scale are positive (but not necessarily increasing).

To ensure that the moral hazard problem does not disappear with project size, we further assume that A's private benefits, $B(I)$, are increasing in size. More specifically, we make the following assumption about the severity of the moral hazard problem.

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

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, O has access to costly monitoring technology she can use to reduce private benefit consumption. For simplicity, we assume that she can eradicate private benefits at cost M. That the cost is independent of I is meant to capture fixed costs of monitoring. Adding variable costs does not affect the results so long as they do not increase too quickly with size. The only condition we need is for monitoring larger loans to be cheaper *per dollar*.[16]

5.2 Size and social risk aversion

Suppose each entrepreneur's financial environment in this economy is described by the social risk model in Section 3. First, let us determine which entrepreneurs can and would raise only family finance (funding from their respective Fs). We know that an entrepreneur's expected utility gain, if reliant on family finance, from the project is $Z - \phi W = (1+\phi)\left(qR(I) - I\right) - \phi\rho q(1-q)R(I)^2$ (see the proof of Proposition 1). The derivative with respect to I is

$$\frac{\partial(Z - \phi W)}{\partial I} = R'(I)\left[(1+\phi)q - \phi\rho q(1-q)2R(I)\right] - (1+\phi)$$

[16] Note that we endow the formal lender with an informational advantage over the informal lender, contrary to what other models often assume about the differences between formal and informal lenders.

Given $R'(I) > 0$, this term is negative for all I above a threshold. As a result, there exists some $\bar{I}_F \in (0, \infty)$ such that $Z - \phi W < 0$ for all $I > \bar{I}_F$, that is, a size above which A is unwilling to fund the project through F alone.

Now consider the case of only formal finance. For O to be willing to be the sole financier, she must find it profitable to monitor the project. She does if $qR_O \geq M$ and, conditional on monitoring, she breaks even if $qR_O = I + M$. This requires $R_O = (I + M)/q$. Consequently, there exists some size $\underline{I}_O > 0$, defined by $R(\underline{I}_O) = (I + M)/q$, such that O is willing to fund the project alone if and only if $I > \underline{I}_O$.

When $\bar{I}_F < \underline{I}_O$—which is, for example, the case for sufficiently large M and ρ—having to choose between the two sources of finance causes firms in the "middle" of the population to be capital constrained (see Figure 1).

Figure 1

There is a simple intuition as to why formal finance requires a lower bound on project size whereas family finance imposes an upper bound. Formal finance relies on monitoring technology that exhibits fixed costs and therefore economies of scale. Monitoring the project is worthwhile only if the involved cash flows are sufficiently large. The lower bound on project size thus increases in the fixed cost M. By contrast, the cost of family finance is that O internalizes the risk that F bears. Thus, when deciding whether to take funding from F, it is *as if* A makes a portfolio decision: whether to invest only in a safe asset that yields ϕW (i.e., preserving F's wealth) or to invest part in a risky asset (i.e., risking part of F's wealth on the project). The larger the project, the larger the share A would need to "invest in the risky asset"—if it is too large, he prefers the safe option. For this reason, the upper bound on project size increases in the risk aversion parameter ρ; the more risk averse A is, the less

risk he is willing to impose on his friend F.[17]

Finally, as in Section 3, combining family finance and formal finance relaxes capital constraints. Consider a project size $\hat{I} = \bar{I}_F + \epsilon$, where $\epsilon > 0$ is infinitesimal. While A's participation constraint is violated under family finance, his incentive compatibility constraint may hold with slack. If so, A can transfer *part* of the cash flow to O without destroying his incentives to run the project well. With enough slack, he can transfer enough to meet his participation constraint, and without monitoring because the presence of family finance ensures proper incentives.

5.3 Size and social frictions

Now suppose the entrepreneurs' financial environment is described by the social debt model in Section 4. Both of the social frictions in this model increase with project size: The expected favor in case of a default increases with the amount laid out by F. This not only imposes greater costs on A if he pays F the favor. It also makes A more prone to deny F the favor, and thus makes the relationship more prone to harm. Thus, larger projects provoke greater social frictions.

Figure 2

To illustrate this in the simplest manner, we focus on a very stark comparison, namely, that between family finance without formal contracting and formal finance. In the absence of formal contracts, family finance is not feasible unless condition (10) can be satisfied, which

[17] In our model, we cannot vary the variance of the project cash flow independent of its mean. It is intuitive, though, that, if possible, the upper bound on project size would increase in that variance, which would mean that A will be less willing to fund a project of a certain size through F if, all else being equal, the cash flow risk is larger.

can be rewritten as

$$\frac{\phi}{1-\phi}(W-I) \geq R_F. \tag{17}$$

We consider the lowest possible R_F, namely, the required repayment if A were to pay F the favor after a default—in doing so, we are conservative in deriving a condition under which family finance is infeasible. This repayment is R_F'' as derived from the breakeven constraint (13). Substituting R_F'' for R_F in (17) yields

$$\frac{\phi}{1-\phi}(W-I) \geq \frac{I-q\phi R}{q\,(1-\phi)+(1-q)(1-\phi a)}. \tag{18}$$

For $I \to \infty$, the left-hand side of this inequality goes to $-\infty$, whereas the right-hand side goes to $+\infty$. Thus, there exists a threshold value $\bar{I}_F'$ such that (18) is violated for all $I > \bar{I}_F'$. In other words, $\bar{I}_F'$ is an upper bound on project size imposed by family finance. By contrast, formal (monitored) finance requires a minimum project size $\underline{I}_O$, as defined in Section 5.2 (see Figure 2).

As before, the lower bound on project size under formal finance stems from the fixed cost of monitoring; however, the reason for the upper bound on project size under family finance is now different. When the financial stakes are high, it is no longer certain that a transaction (even) between friends will be concluded frictionlessly. The temptation to prioritize financial gains over friendship becomes stronger, which can lead to broken promises and relationships. This puts a limit on the stakes that the friendship can support in the transaction.

Again, combining formal finance and family finance can improve matters. As discussed in Section 4, A could seek $I_F < \bar{I}_F'$ in funding from F, just enough to satisfy (17). This would reduce the amount of money that must be raised from O, possibly so much so that A's incentive compatibility constraint holds. If so, A can fund projects larger than $\bar{I}_F'$ without

having to compensate O for monitoring costs.

6 Discussion

6.1 Microventure capital

The quote from Collins et al. (2010) in the introduction illustrates that demand-side constraints play a role in practice; there are borrowers that eschew family finance for fear of social frictions, and such behavior is by no means anomalous. At the same time, Collins et al. (2010) find that "the most important providers of loans are not moneylenders but friends and neighbors" (14). Indeed, "almost every household borrowed informally from family and friends" though many of the households report that "they found informal transactions unpleasant but unavoidable" (16).

A central finding of the above study is that the poor use financing primarily to ensure *dependable* cash flows and to *manage risks*, because their overarching concern is uncertainty (18):

> The households ... live lives that are far more uncertain than those in better-off circumstances. [They] 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 they (already) face and the anxiety is to be conservative;

that is, they take few risks.[18] In light of our theory, this should be true with respect to not only one's own money but also money from family and friends, because they face the same harsh reality and a default can seriously harm them as well as the borrower's relationship to them. If so, family finance primarily serves safe purposes, or as insurance rather than risk capital. Indeed, ample empirical evidence shows that intra-family transfers among the poor help smooth consumption (e.g., Udry, 1996) and provide insurance (Ambrus et al., 2010), quite the opposite of providing funds to take *on* risky ventures.

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 non-business purposes, such as consumption smoothing (e.g., Collins et al., 2011: 47). That is, microloans seldom fund entrepreneurial risk-taking. Part of the explanation is that microfinance lending is typically designed to minimize default, that is, they often make "zero default" imperative (Banerjee and Duflo, 2010: Chapter 6). For our discussion, it is instructive to consider joint-liability group lending. The original idea behind joint-liability loans is that the group members, through social pressure, induce each other to repay their loans. While this increases the incentives to repay, it also induces risk-avoidance: group members will be reluctant to take risks lest they could default and harvest the anger of the other group members. 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.

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

Such potential costs, as intended, discourage default. But intolerance of default is antithetical to providing *risk* capital. After assessing this and similar caveats of microfinance that deter risk-taking, Banerjee and Duflo (2010: 181) conclude that "finding ways to finance medium-scale enterprises is the next big challenge for finance in developing countries."[19]

Our analysis suggests that microfinance programs that want to harness the power of social relations for incentives but, at the same time, encourage risk-taking should give thought to (how to reduce) social risk aversion and social frictions. This idea is actually not novel. In many developed economies, there are formal intermediaries specialized in arranging and administering so-called friends-and-family, or social, loans. In the United States, for instance, such intermediaries include LendFriend, Lending Karma, LoanBack, One2One Lending, WikiLoan, ZimpleMoney, Prosper, Bainco, and National Family Mortgage. The key idea behind this business is that the third-party intermediation and formalization of financial transactions between relatives or friends safeguards those relationships, as the following advertisement expresses:

> Essentially, we provide a simple way to structure a social loan to help keep friendships exactly as they should be—friendly. ... We orchestrate the logistics of the loan from behind the scenes to ensure that both the borrower and the lender are free from the pressure that can often result from less formalized social loans.[20]

A similar *intermediated social finance* approach could be taken to the provision of microventure capital. The basic principle would be to both use social relations for incentives and

[19] In practice, this debate has spawned a new breed of microfinance: microventure capital. *Forbes* ran a cover story on microventure capital, "Can Venture Capital Save The World?," on December 19, 2011. *Time* ran a cover story on the microfinance lenders in the US, "Can Microfinance Make It in America?," on January 11, 2009.

[20] From http://www.virginmoneyus.com/Virgin_Money_Social_Loans, accessed on March 25, 2010.

protect them by limiting downside social risks and frictions through formal intermediation. The following is a tentative proposal:

> 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 maintain 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 used to grow the fund. Profits that accrue to the formal fund are paid out to the NGO. 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 fund harness the social relations, respectively, for information and for incentives. The anonymity of the vote, the formal funding, and the NGO stepping in-between the village and the entrepreneurs 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 "rents" that accrue to the villagers can be interpreted as compensation for providing information and incentives.

6.2 Formality as innovation

Compared to the existing literature on social ties in financial contracting, which emphasizes the benefits of social ties, our analysis focuses more on the benefits of *not* having to rely on social ties, that is, the "value added" of formality. To view formality as an innovation

is, arguably, historically correct: family finance probably preceded formal finance. Even today, absent formal institutions, transactions primarily occur within the confines of social relations.

Formal enforcement allows transactions with people beyond one's immediate social sphere. A clear benefit of this is access to more potential counterparties. In this paper, we emphasize another key advantage of formality, one that comes out in the following quote:

> Jeffrey Wolfson, a Boston attorney with a family business practice, often urges clients to approach outside lenders before soliciting family funds. ... By the same token, bankers usually regard family contributions as part of the entrepreneur's equity—and evidence that a start-up is more than a hobby. "You don't want to go back to an aunt or uncle and say, 'I lost the money,'" observes Carl Harris, first vice-president at People's Bank in Bridgeport, CT.[21]

Between the lines, this passage makes three noteworthy points: First, for some reason, people deem losing a family member's money worse than losing a bank's (or stranger's). Second, this is why family finance breeds trust. Third, it is also a reason to avoid family finance.

Both our models match these points naturally. But while it is easy to see risk sharing as an innovation of formal finance, arguing that it has evolved to avoid (social) "indebtedness" is less obvious. Yet the evolution of formal finance much reflects this rationale. Historically, the original norm for all loans—including formal ones—used to be personal liability.[22] But already in ancient times, there was an awareness that unlimited liability could be harmful. Deuteronomy 15:1-2 says,[23]

[21] From http://www.businessweek.com/smallbiz/news/columns/98-25/e3583056.htm, accessed on March 26, 2012.

[22] Such personal liability could mean slavery for delinquent debtors and sometimes their entire households, imprisonment, or even the death penalty (Levinthal, 1918).

[23] Asking why any lending occurred under these circumstances, Atwood (2008: 48) interestingly submits:

> 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.

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.

Indeed, the roots of modern bankruptcy laws are considered to be the bankruptcy reform Julius Caesar implemented: He allowed moneylenders to confiscate land in lieu of debt payments but allowed a bankrupt borrower to walk away from any debt with the tools of his trade and related lands and limited the personal liability of the borrower's immediate and extended family. Caesar's express intention was that the borrower could start over, with a clean slate, rather than waste talent in personal bondage.

Lost in the Middle Ages, this *tabula rasa* approach to bankruptcy reemerged during the Enlightenment. By the 1800s, England periodically released debt prisoners and forgave their debts. In 1833, US federal law abolished debtor prisons, which was followed by decades of legislative bargaining about bankruptcy law. In his book on the evolution of bankruptcy law, Skeel (2003: 26) cites a famous speech by Daniel Webster that articulates a key concern behind this legislative process, namely, that persistent debt is counterproductive::

> Sir, 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

"Probably 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." This is to say that, *socially*, the obligations persisted beyond the legal forgiveness.

> debt, at least as it existed in this country ten years ago, have imposed more restraint on personal liberty than the law of debtor and creditor imposes in any other Christian and commercial country. 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.

The modern legal approach to bankruptcy, with its leniency toward debtors, marks an evolution from personal bondage to limited liability. We argue that this is a key innovation that distinguishes formal finance from family finance. With formal finance, liability is designed by contract and enforced by law. With family finance, emotions, norms, and social pressure define the degree of indebtedness.[24] Formal finance can thus eliminate liability when social obligations would persist and, by the same token, enforce liability when social incentives have no bite.

In essence, we posit that formal enforcement allows for *contractual* designs of liability that are more flexible than *social* obligations. Crucially, this argument presumes that social obligations, unlike contractual liabilities, cannot credibly be finetuned ex ante—if this were

[24]The notion of debt exists as both a social and moral concept outside the legal context. Note, for example, the wording *forgive us our debt* in the Lord's Prayer, religious parables comparing sinners to debtors, and the phrases *you owe me* and *to pay a debt of gratitude*. In certain languages (such as German), the idea is so ingrained that the words for debt and guilt are the same (*Schuld*). Margaret Atwood elaborates on the anthropological, both cultural and physical, foundations of debt as a social concept in her book *Payback*.

possible, social obligations would dominate formal contracts in our model. One possible explanation is that social frictions arise from norms and violations thereof that elicit emotions, such as disappointment, anger, or indignation, that are hard—perhaps impossible—to suppress. While this rigidity may seem to be a disadvantage, it has purpose. If emotional reactions were contractible, they should—like contractual liabilities—be renegotiable as well. However, this would render the threat of ex post (inefficient) social frictions an empty one, undermining the positive ex ante effects. In other words, the rigidity of the emotional reactions underlying social frictions is the *source* of commitment. This is consistent with one of the principal evolutionary theories of emotion in social psychology, according to which (some) emotions have evolved as commitment devices (see Haselton and Ketelaar, 2006, and the references therein).

6.3 Robustness

6.3.1 Social risk assumptions

The principal assumptions of the social risk model are A's risk aversion and the altruism between A and F. The particular specifications selected for these assumptions in Section 3, however, are not crucial. Instead of assuming that A and F internalize each other's *realized payoff*, we could assume that they internalize each other's *realized utility*. A would, if risk-averse, still experience disutility from volatility in F's utility, and hence prefer to sell any risk to O. We could also assume that A and F internalize each other's *expected utility* (at time 0) though we find this less plausible. In this case, the main conclusions go through so long as F is also risk averse and A therefore internalizes F's (but not O's) disutility from bearing risk.

This brings us to the other assumption: risk aversion. In Section 3, only A is risk averse.

We could alternatively assume either that (i) F is also risk-averse, (ii) everyone, including O, is risk averse, or (iii) everyone except A is risk averse. In the first case, formal finance is superior to family finance from a risk-sharing perspective, even in the absence of altruism. Our model rules this out in order to isolate the impact of social risk aversion. In the second case, little changes except that F would also have a preference for A transferring risk to O because F would be averse to risk borne by A. In the third case, social risk aversion emerges provided that A internalizes F's utility. Thus, our conclusions do not rely on the assumption that only A is risk-averse.

6.3.2 Social debt assumptions

The key assumption of the social debt model is that the altruism between A and F decreases if A refuses to recompense F for a past shortfall through favors. This is how Section 4 specifies the fragility of friendship.

Alternatively, we could assume that the altruism is sensitive also to other decisions and outcomes. For example, the relationship could suffer immediately upon a family loan default, which would represent a simpler form of social friction. Another possibility is to assume that F can see A's project decisions and will renounce the friendship if A consumes private benefits at F's expense. If sufficient, this threat creates commitment against private benefit consumption, but it does not eliminate the possibility of social frictions following a default. That said, if we let friendship be vulnerable *only* to private benefit consumption, and let private benefit consumption be seen only by F, then we would merely assume that family finance has a technological monitoring advantage over formal finance, with no downside. This would amount to assuming away social frictions on the equilibrium path.

Last but not least, we could introduce actions on the part of F that relate to the financial

transaction, such as seizing collateral or actively exerting pressure, and assume that the friendship is vulnerable to such actions as well. This would add to the social frictions that make family finance costly and hence reinforce our conclusions.

Again, our conclusions seem robust to alternative specifications. The crucial assumptions are that defaults on family loans create social obligations and that the ex post fragility of social relations cannot be finetuned ex ante, as discussed in Section 6.2.

6.3.3 Adverse selection

Our model uses moral hazard as the specific friction impeding external finance. Similar insights, however, can be obtained in a model with adverse selection. For example, suppose A needs external funding for a risky project but has private information about its expected return. He can signal favorable information by retaining a larger stake in the project. The greater the temptation to lie about the expected return, the more must A retain.

It is easy to see that A has less incentive to lie to F than to O: Because A internalizes part of F's payoff, his gain from lying to her is smaller. As a result, A must retain less in order to credibly signal information to F. At the same time, funding the project through F, as opposed to O, forces A to internalize more social risk, or exposes him to more social frictions. Thus, family finance is a costly signaling device, and the strength of formal finance is that it reduces social risk and sidesteps social frictions.

7 Concluding remarks

We present two models of formal and family finance in which a family investor differs from a formal investor only in that she has an altruistic relationship with the entrepreneur who seeks funding, and not in her information or enforcement technology. According to

both models, this single difference leads to benefits and costs of family finance that make the choice—or, better, the interaction—between the two sources of finance quite interesting. Family finance breeds trust, but it also has social ramifications that discourage risk taking. Conversely, by circumventing such ramifications, formal finance encourages risk taking. Combining the strengths of both sources can thus be optimal in harnessing social relations for incentives but weaving in formal intermediation to mitigate the social repercussions of financial transactions.

We believe it is worthwhile to devise direct empirical tests of our key predictions, namely, (i) that family finance discourages risk taking, (ii) that this happens because of aversion to both social risk and social frictions, (iii) that defaults harm the quality of social relations, and (iv) that formal finance alleviates these effects. In particular, it would be interesting to study (the impact of) variations of the intermediated social finance model proposed in Section 6.1. In the best case, this can deliver insights that help improve the provision of microventure capital.

On the theoretical side, we have clearly left some issues unaddressed. Two strike us as good candidates for future research. First, our model deliberately abstracts 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 very rare, and much more so than family debt, but, when used, often turns out to be an important source of finance for the firm in question. We conjecture that the optimal security design, though beyond the scope of this paper, is affected by the trade-offs discussed. For example, in the social risk model, debt would impose less risk on family members, but giving them equity would lead to stronger social incentives—or, if co-financing by a formal investor is involved, a stronger certification effect.

Second, we have yet to analyze the endogenous formation of social relationships. Again, consider the social risk model. Having altruistic ties to multiple others allows the entrepreneur to spread the risk, and this could create a social "diversification" effect. If forming a social tie is costly, an optimal number of friends, that is, network size, exists. Furthermore, our analysis suggests that improvements in the quality of formal finance—for example, better legal enforcement or monitoring technology—should reduce the optimal network size, since social relations become less important and hence less attractive. We think that such effects of improved formal institutions on social network formation comprise a more general phenomenon and may underlie various socioeconomic trends, such as the continuous decline in family size and the trend toward living solo.

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Figures

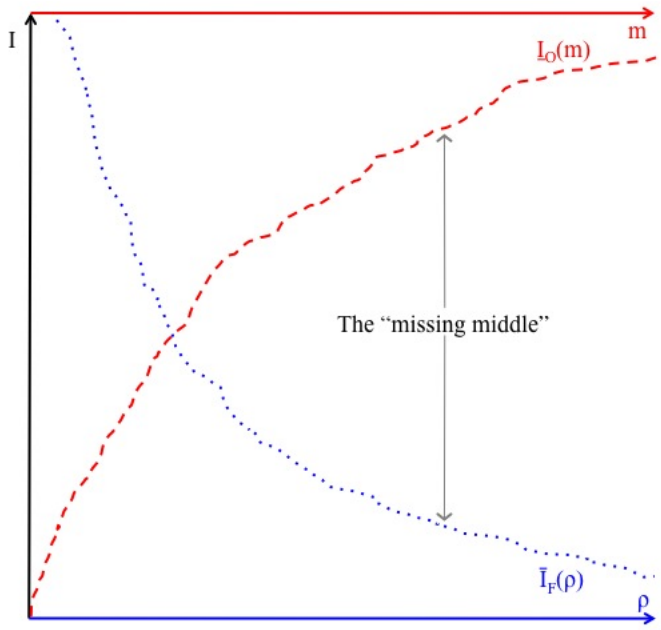

Figure 1: Project size (I) is depicted on the vertical axis, the entrepreneur's risk aversion (ρ) on the bottom horizontal axis, and the formal investor's monitoring cost (m) on the top horizontal axis. The dotted line depicts the maximum project size under family finance as a function of risk aversion, $\bar{I}_F(\rho)$. The dashed line depicts the minimum project size under formal finance as a function of monitoring cost, $\underline{I}_O(m)$. Project sizes above the dotted line but below the dashed line are capital constrained (the missing middle).

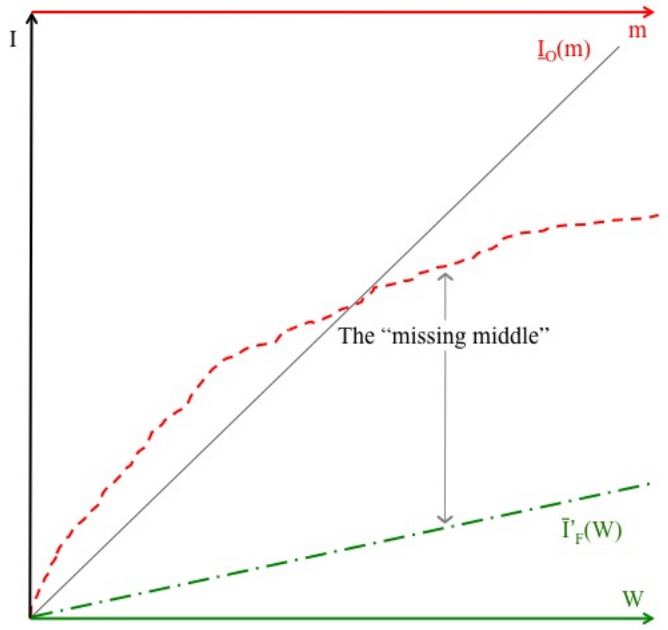

Figure 2: Project size (I) is depicted on the vertical axis, the family investor's wealth (W) on the bottom horizontal axis, and the formal investor's monitoring cost (m) on the top horizontal axis. The solid diagonal is the 45 degree line. The dashed-dotted line depicts the maximum project size under family finance as a function of the altruism and the family lender's wealth, $\bar{I}'_F(W)$. The dashed line depicts the minimum project size under formal finance as a function of monitoring cost, $\underline{I}_O(m)$. Project sizes above the dashed-dotted line but below the dashed line are capital constrained (the missing middle).