Financing from Family and Friends*

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Abstract

We present two models in which a family investor differs from a non-family investor only in that she has an altruistic relationship with the entrepreneur who seeks financing. We show that because of this single difference, family finance is a source of trust capital whereas formal finance is a source of risk capital. Both deepen the financial market. Family finance has two drawbacks: Risk remains in the entrepreneur's social sphere and exposes his social relations to negative feedback effects, both deterring risk taking. Our models emphasize crucial differences between legal liability and social indebtedness and shed light on the dearth of growth finance in developing countries. Based on these insights, we propose a method for providing microventure capital.

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Those we hurt the most are often those we love the most. — Unknown

1 Introduction

Financing from family or friends—hereafter, family finance—is an important phenomenon. It is a dominant source of seed capital for small business in developed economies (Figure 1) and more so in less-developed ones. It is the most common source of finance for the poor (Collins et al., 2010), especially for the third of the world's population without access to formal finance. Moreover, it is important for small and medium enterprises (SMEs), a sector that comprises much of worldwide economic activity.[1] A recent industry report estimates that financial institutions have yet to tap into a potential global market for SME financing worth about $5 trillion (MasterCard, 2008).

Figure 1

Notwithstanding family finance, there is often financing gap, a lack of growth finance for SMEs, that afflicts developing countries in particular (Organization for Economic Co-operation and Development, or OECD, 2006a,b). The hope that microfinance would fill this gap has waned (Banerjee and Duflo, 2011), though new initiatives have recently emerged to readdress the problem (Forbes, 2011). Against this background, it is important to study family finance to understand how its works, and, crucially, its limitations.

In a frictionless economy, there is no need for family finance. Hence, theories of informal finance assume some friction, adverse selection or moral hazard, and some technological advantage on the part of the informal financier, such as superior information, better monitoring, or a greater ability to enforce repayment. Sometimes, when there is a choice between different sources, informal finance is subject to wealth constraints or higher refinancing costs, thus making informal finance, while more effective, scarcer.

This portrayal fits informal moneylenders, but less so family finance. Family members are arguably often less capable of assessing an investment than a specialized bank, but they still invest. Also, unlike moneylenders, they do not necessarily require higher returns. Quite the contrary, they often accept zero or even negative returns. Perhaps more oddly, entrepreneurs often avoid family finance, even when it is cheaply available (Collins et al., 2010).

[1]For example, a 2005 OECD report estimates that 80 percent of the firms in the Congo had fewer than five employees and 83 percent were informal; SMEs in Kenya employed 3.2 million people; SMEs in Nigeria accounted for 70 percent of industrial jobs; 93 percent of all industrial firms in Morocco were SMEs and accounted for 46 percent of all jobs; in South Africa, small business provided more than 71 percent of the employment.

In searching for a suitable model of family finance, it is instructive to start with real-world commentaries:

> [Family financing is] an approach to raising money as complex, combustible, and rewarding as families themselves. Done right, it can provide patient capital, while building credibility with other lenders and investors. Done wrong, it can break the very bonds of familial affection. No matter what, "if a deal goes south, it can really screw up Christmas."[2]

Consider also the following:

> Financial planners warn that intrafamily loans can lead to trashed relationships. ... People who've lent money to family members often complain about ingratitude, missed payments and strained holiday dinners. Even the borrowers grumble, especially when their benefactors start quizzing them about their spending. "Suddenly, [the lender] is looking at the vacation they took and saying, 'They owe us money, how can they go on vacation?"[3]

Such advice by (small) business finance professionals is the rule, not the exception. It informs us in two ways. First, the key difference between family finance and formal finance may stem from social rather than technological aspects. Second, the social aspects in question may not always be benign.

This paper studies two models in which family and formal investors are identical in all (technological) aspects except that the family investor has a mutually altruistic relationship with the entrepreneur. The first model considers a one-time interaction in which the strength of the relationship (the degree of altruism) is invariant. In the second model, the relationship can be affected by actions in the wake of the financial transaction.

In this rather simple framework, both sources of finance deepen the market: Some projects can be realized with formal finance but not family finance, whereas for others, the opposite is the case. The reason is that the two sources supply different forms of capital. In our own words, and for reasons explained below, family finance provides *trust capital*, whereas formal

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

[3]From http://www.bundle.com/article/the-right-way-to-loan-money-to-family-members-7202, accessed on March 26, 2012.

finance provides *risk capital*. Because of their different roles, the two forms of finance can be combined to maximize market depth, a point we use in Section **5.1** to propose a method for providing venture capital in developing economies.

Both models share the above conclusions but highlight different reasons why family finance is good for trust but bad for risk. In the first model, the entrepreneur is faced with a social version of the classic trade-off between risk sharing and incentives. Altruism means that the entrepreneur cares about cash flows to a family member—not just levels but also volatility. This renders family finance good from an incentive perspective, but bad in terms of risk sharing.

In the model, the entrepreneur is subject to moral hazard: He can extract private benefits at the expense of cash flows. His project is only financed if investors can ensure he will not (have the incentive to) extract these benefits. As in other similar models, formal finance cannot always guarantee this, in which case family finance can help. Selling claims yields necessary start-up funds, but selling them to family members, thanks to altruism, reduces the entrepreneur's incentives less. Knowing this, family investors will *trust* the entrepreneur with more capital than a formal investor would. Moreover, since they also care about the entrepreneur, they may even be willing to accept a return below the breakeven rate. As a result of these two effects, otherwise infeasible projects may be feasible under family finance.

However, inasmuch as the entrepreneur's altruism preserves his incentives, it also channels risk back to him: Being risk averse and altruistic, he dislikes exposing his family members to volatility; put differently, he worries about them. Thus, incentive problems aside, he prefers to transfer as much risk as possible to formal investors. In addition, for certain risky projects he is neither willing to bear the risk himself nor willing to impose it on family, though he would be willing to undertake the projects if he could shift (some of) the risk to formal investors. Thus, the innovation of formal finance, relative to family finance, is to channel risk out of the entrepreneurs' social sphere, which fosters entrepreneurial *risk*-taking.

We believe this trade-off to be a real phenomenon. Imagine quitting your job to open a restaurant, for which you need $100,000, and consider borrowing the amount from a large bank. Should you fail, you will mourn your own loss but hardly the bank's. Suppose, instead, that your parents lend you their savings or co-sign the bank loan. Now a failure hurts twice: Not only will you bemoan your own loss but also the hardship confronting your parents. Ex ante, you may dislike exposing your parents to this risk—that is, you worry about their financial future—and thus prefer not to involve them. However, the bank does not trust you enough to approve the loan, whereas your parents may trust you with their money, confident you will do your utmost to repay them. Still, you may pass up your parents' offer and stay at

your job, since you find the venture worth gambling the bank's money but not your parents'.[4]

Lastly, in the model, some projects can be undertaken only with a combination of family finance and formal finance. It is generally optimal for the entrepreneur to obtain just enough family finance to ensure proper incentives and the remaining capital through formal finance, but in some cases both are required, since he might elicit too little trust without family finance and bear too much risk without formal finance.

The second model involves "life after the project," in which the entrepreneur has access to income that is non-contractible at the beginning; it can be non-verifiable or immune to legal recourse. Crucially, we assume that the entrepreneur's use of this income can affect his relationship with a family investor. Should the entrepreneur, though able, refuse to settle an "old family debt," the relationship will suffer. Thus, the relationship (quality) is a form of social collateral that, as in Karlan et al. (2009), renders non-contractible cash flows pledgeable.

In this model, the entrepreneur trades ex post for ex ante efficiency. Family finance engenders three ex post effects: It increases pledgeable income, it endangers the relationship, and it can distort future choices. All three ex post effects, in turn, increase the entrepreneur's ex ante incentives by making project failure less attractive. As a result, sometimes family investors trust the entrepreneur with their money while formal investors will not. The catch is, of course, that the ex ante benefit of family finance hinges on the risk of ex post inefficiency, since social frictions, such as damaged relations and distorted choices, are deadweight losses. Thus, the risk of social friction makes family finance both more effective and less attractive.

For this reason, and since failure can provoke social frictions, there also are risky projects that the entrepreneur can undertake with formal finance but not with family finance. Again, formal finance is the better source of risk capital. In this case, the innovation of formal finance is that it sidesteps social frictions, or, put differently, the weakness of family finance is that financial transactions, due to default risk, can have repercussions for social relationships.

This trade-off, too, strikes us as realistic. Consider the aforementioned example. Besides a $100,000 bank loan, your alternative this time is to ask your parents-in-law for the capital. If they agree, not only will a failure harm you financially but the lost capital will stand between you and them, burdening your future relationship: You may feel uncomfortable in their company, change your behavior toward them, or—if you continue to go about life "as if nothing happened"—lose their sympathy. Granted you would work harder to avoid failure, but you still may dislike the risk of such social frictions and thus prefer to approach a bank. However, as before, a bank may not deem you creditworthy, leaving you to jeopardize your

[4]Causing one's family financial hardship can lead to tragic acts of redemption. The article "Debt Destroyed My Family" (*The Guardian,* June 8, 2008) recounts one such tragedy.

in-law relations for a restaurant career or to simply stay at your job.

We further discuss the difference between formal and family finance in the second model at a more fundamental level. In essence, the crucial assumption is that the entrepreneur and the family investor cannot contractually specify the severity of social repercussions beforehand. Intuitively, the idea is that they cannot contractually enforce degrees of disappointment, anger, or other emotional reactions; else they could finetune these consequences such that the "social" contract would be superior to any formal contract. However, if social consequences were indeed contractible, it should also be possible to *re*negotiate them later, in which case family finance would provide no commitment to begin with. Thus, the inflexibility of social repercussions is both the virtue and weakness of family finance.

By the same token, the innovation of formal finance is that it can tailor "liability" more flexibly than family finance. Contracts enforced by law can limit liability vis-à-vis strangers in cases where social obligations vis-à-vis one's family would persist. They can also enforce liability where social pressure would fail. For this reason, even family finance benefits from using formal contracts. We show that formalizing repayment commits the entrepreneur to repay in situations that might otherwise stir up social frictions and that this commitment is valuable ex ante. This prediction is also reflected in the real-life advice of family finance experts:

> Draw up a contract. You both may be "handshake" type of people, but ... put your expectations and your lender's expectations in writing and both of you sign it. ... If there's more than $10,000 involved, use a lawyer to review the contract. You'll both be much happier down the line if you have that document to refer to.[5]

There are even intermediaries specialized in formalizing family transactions. As discussed in more detail in Section **5.2**, they do not make investment decisions but merely serve as legal middlemen who structure and administer financial transactions between family members or friends.

In the final part of our analysis, we grant the *formal* investor a technological advantage: We assume she has access to costly monitoring technology that can eliminate private benefit extraction at a fixed cost. The fixed cost creates a lower bound on project size below which formal finance is not feasible. By contrast, we show that family finance in both models sets an upper bound on project size. As a result, there is a "missing middle." This is consistent with the top- and bottom-heavy distribution observed in many developing countries, where small

[5]From http://greenbusinessowner.com/raising-funds-for-your-green-business-considerations-for-personal-loans, accessed on March 26, 2012.

and large firms raise family finance and formal finance, respectively, but the middle range is capital constrained (International Finance Corporation, or IFC, 2009). As mentioned, combining the two types of finance reduces the gap. This motivates us to theorize about a financial intermediation design that harnesses the power of social relations while minimizing social risk and social frictions to effectively bridge the "missing middle."

This paper relates to work that analyzes the role of social ties in financial contracting. One approach builds on the idea that social ties harbor information: If social lenders have lower monitoring costs or superior information, they reduce moral hazard problems (Stiglitz, 1990; Varian, 1990; Banerjee et al., 1994; Jain, 1999), costly ex post state verification (Mookherjee and Png, 1989; Prescott, 1997; Gine, 2011), and adverse selection (Ghatak, 1999). We do not assume any informational differences between investors and hence do not rely on either of these mechanisms.

Another approach, related to our second model, argues that social ties—by harboring 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. 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 transactions, these papers pay less attention to the downsides of social enforcement. Ghatak and Guinnane (1999, p.221) write in their survey that "the literature on group lending shies away from discussing the possible negative implications of peer pressure" and cite real-world examples from Montgomery et al. (1996) where reliance on social relations for enforcement damaged those relations ex post and even provoked violence. Ghatak and Guinnane (p.225) conclude,

> 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.

We concur, and our second model examines an entrepreneur's choice of funding specifically when financial transactions can entail negative feedback effects on social relations.

The theoretical literature on family firms treats 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. Empirical studies by Schulze et al. (2001), Bertrand and Schoar (2006), and Bertrand et al. (2008) informally discuss that family members can have disagreements or non-pecuniary objectives that adversely affect corporate decisions. In addition, Schulze et al. (2001) conjecture that altruism among family members can soften discipline.[6]

The much broader literature on family economics starts with Becker's (1973) unitary model of the household, which treats the family as a single decision maker. Mounting 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. Again, with empirical evidence challenging the efficiency assumption (e.g., Udry, 1996; Duflo and Udry, 2004; Ashraf, 2009; Ashraf et al., 2010; and Schaner, 2012), 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 channels are different: In our first model, it is the "harmony," and not the conflict, between family members that renders family transactions less efficient than formal ones; in our second model, family transactions are less efficient not because existing preferences distort incentives, but because the transactions can damage family relations. We are not aware of any study on family economics or family firms that considers these effects or financial contracting problems between family members.

Several empirical papers are related to our study's perspective. Bertrand and Schoar (2006) study correlations consistent with the idea that "family values" can negatively affect firm value, while Bertrand et al. (2008) present evidence suggesting that conflicts between multiple heirs damage family firms. For group loans, 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 defaults can still harm these relations. Regarding family finance, using the Kauffman Firm Survey, Robb and Robinson (2012) find that the startups in their sample rely much less on funding from friends and family than expected, and much more on external sources such as banks. This is consistent with

[6] Alger and Weibull (2010) 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*.

our theoretical conclusion that entrepreneurs prefer formal finance, sometimes even requiring it, when funding risky investments.

The paper proceeds as follows. Sections 2 to 4 formally develop our main arguments, focusing in turn on social risk, social frictions, and the missing middle. Section 5 discusses the practical relevance of our results for development finance, the link between our results and the historical evolution of bankruptcy law, testable empirical predictions, and alternative modeling assumptions. Section 6 presents our concluding remarks.

2 Social risk

2.1 Model setup

A penniless agent, 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 $W > qR$. 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 contributes 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 a fixed amount $B > 0$ as private benefits. Private benefit extraction makes the project less likely to succeed and reduces the probability of success from q to 0. We make the following parametric assumption.

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

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

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.

2.2 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 analysis.

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

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

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 $E[U_A(\pi_A^s)|0, R_F, R_O] = qR_O + I_F - I + \phi\left(W - I_F + qR_F\right) - \rho q(1 - q)\phi^2 R_F^2$, 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 in ρ, ϕ, and $q(1-q)$.*

A finds financing from F less attractive, the more he worries about risk (ρ), the more he cares for her (ϕ), and the riskier the project is ($q(1-q)$).

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 non-pecuniary benefits. Indeed, if A were forced 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.

2.3 Social incentives and risk aversion

Once there is moral hazard, A may not be able 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,

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

The left-hand side of (6) is A's expected utility from a well-run project; it comprises utility derived from his own and $F's$ expected cash flow, $q\left(R_A+\phi R_F\right)$, and disutility derived 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 the private benefits he can consume.[7]

Since A wants to maximize R_O, he chooses R_A and R_F just large enough for (6) to be binding. Provided that a solution exists, the resulting quadratic equation yields

$$R_A+\phi R_F=\frac{q-\sqrt{q^2-16B^2}}{2\rho q(1-q)} \equiv \underline{R}. \tag{7}$$

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

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

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.

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

Proof. Absent O, the project is forgone unless F funds it fully. The breakeven constraint then yields $I_F = \frac{qR-\phi I}{1-\phi}$. If the project is funded, all risk is sold to F, and A's expected

[7]Note that greater risk aversion (larger ρ) draws A toward private benefits, thus paradoxically forcing him to bear more risk (larger $\underline{R}_A^O$). This is an artifact of the assumption that private benefits are less risky.

utility is $Z \equiv (1+\phi)(qR-I)+\phi W-\rho q(1-q)\phi^2 R^2$. By contrast, if A funds the project with the help of O, his utility is given by (8) with $\underline{R} < R$; let Z' denote this utility. There exist parameters consistent with **A1** such that $Z < 0 < Z'$ (e.g., for ρ such that $Z < 0$, let $B \to 0$). □

As Lemma 1 highlights, A dislikes exposing not only himself but also his friend F to risk. Absent O, A may even prefer forgoing the project over taking the risk or imposing it on F. 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. Absent F, A needs to retain a claim $R_A = \underline{R}$ to satisfy the incentive compatibility constraint (see (7)). However, the residual claim $R - \underline{R}$ 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 $q(R-\underline{R}) \geq I$. Substituting for $\underline{R}$ and rearranging yields $qR - I \geq \frac{q-\sqrt{q^2-16B^2}}{2\rho(1-q)}$. There exist parameters consistent with **A1** that violate this condition. If the condition is violated, F is needed to fund at least part of the project. Her breakeven 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, I_F must be larger than in that case: $I_F = qR_F+\varepsilon$, where $\varepsilon > 0$. With F's help, A can therefore raise $qR_F+\varepsilon+q(R-R_F-R_A) = qR_F+\varepsilon+q(R-R_F-(\underline{R}-\phi R_F)) = \varepsilon+q(R-\underline{R}+\phi R_F) > q(R-\underline{R})$. □

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 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 $R_A + \phi(R - R_A) \geq \underline{R}$ 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 have a symbiotic relation. One may not be possible 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. The latter 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 $R_A + \phi R_F \geq \underline{R}$ has more slack. A can then sell more risk to O, which he wants, without losing his incentives. □

Closer ties to F make A raise more funding from O, since less funding from F suffices to obtain (more) funding from O. That variation in ϕ makes the two sources of finance appear to be substitutes is due to the fixed project size. Allowing for choice of project size may emphasize the symbiosis more, in that a larger ϕ can lead to more family finance *and* formal finance.

3 Social debt

3.1 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. At time 2, A can find a new project at a fixed effort cost $C > 0$. The new project requires, for simplicity, no financing and yields $\bar{R} > 0$ with certainty. Alternatively, A can decide to quit self-employment for a job that pays a fixed salary $L > 0$. Either alternative pays out at time 3. Times 2 and 3 and the career decision are stand-ins for life after the project and some decision in that future. We assume this to be a (type of) decision that is non-contractible (at time 0).

In addition to **A1**, we make the following parametric assumptions.

A2. $\bar{R} > \max\{C + L, I\}$.

This assumption says that it is efficient for A to stay self-employed and that the new project yields enough to fully repay his investor(s). The latter is inconsequential for our results and merely simplifies the analysis.

A3. $L < I$.

This assumption says that A's funding need at time 0 exceeds what A can earn in the labor market if the project fails. Effectively, this means that the investment presents such a large risk that failure is material enough to affect A's future decisions.

We extend the timeline to introduce the following assumption concerning the relationship between A and F. Up until time 2, nothing changes. At time 3, A and F's relationship suffers if A refuses to use available income to compensate F for any shortfall sustained at time 2. For simplicity, we assume that ϕ drops to 0 if A willfully dismisses any "old debt." If there is nothing left to settle at time 3, their relationship is safe.

We aim to capture the following idea: Friends or relatives often base their entitlement on *personal promises* rather than the *letter of the contract*. While failing to keep a promise involuntarily may be forgivable, prioritizing one's own pleasure is a more prickly matter and

indulging oneself but ignoring social debts can damage relations. Many find it hard—perhaps beyond their control—to suppress negative emotions, such as disappointment or indignation, toward someone who is a "friend in need but not in deed."

We adopt the idea that social relations are fragile from Karlan et al. (2009), although we model it somewhat differently. The threat of losing friends creates a form of social collateral that can exact repayment. This remains true in our model but we further show that it can also distort other decisions.

3.2 Social frictions

To clarify the forces at work, we isolate the costs of family finance. Again this is best done in a setting without private benefit consumption, which allows us to focus on repercussions for life after the project. In this setting, we first study informal contracting between A and only F and then analyze the effects of introducing, in turn, formal contracts and O. As a starting point, suppose there are no formal contracts. Absent formal enforcement, 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. Suppose A has the money to fully repay the investment outlay I. He does so only if

$$\phi W \geq I, \tag{9}$$

that is, if the friendship (after repayment) is worth more to him than the money he gives up. In other words, he repays F if his social collateral ϕW is sufficiently valuable. If (9) holds, A is also willing to use his labor income $L < I$ to cover any shortfall, in which case he retains F's friendship since he pays as much as he can. Thus, (9) fully characterizes A's repayment incentives.[8]

If (9) is violated, the project may not be funded; F could lose I plus a friend. For example, if $\phi W < L$, he would indeed lose both. The looming loss of friendship can be pivotal. There are cases in which a mere loss of money would not be reason enough for F to deny funding.[9] This is the first example of the main point we put forward: The anticipation of social frictions can frustrate financial transactions between friends. Another example follows further below.

If (9) holds, A will use his available cash to repay F but the social obligations can create

[8] Repayment hinges on the fragility of the friendship, since fixed altruism is too weak here for $\phi < 1$.

[9] F's participation constraint would be $W + \phi(\bar{R} - C) \leq W - I + \phi(qR + \bar{R} - C)$, 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.

other distortions. Consider A's career choice after a project failure. Anticipating that he will be compelled to repay F as much as he can at time 3, he exerts entrepreneurial effort at time 2 only if $\bar{R} - I - C + \phi W \geq \phi W$. This simplifies to

$$\bar{R} - C \geq I. \tag{10}$$

The efficient decision is to remain an entrepreneur if $\bar{R} - C \geq L$ (**A2**), which is more lax than condition (10), since $I > L$ (**A3**). This means that a social debt to F makes A more prone to inefficiently quit entrepreneurship after a failure.

This inefficiency is the result of an interaction between (9) and (10). The former constraint captures the idea that social pressure pushes A to payments he is not legally bound to make. The latter constraint captures the idea that this pressure influences not only repayment but also other decisions; in this setting, it dampens entrepreneurial initiative.

Our point is that social debt creates distortions, but not that they take on this particular form. In fact, a variation of the model could yield the opposite: If continued entrepreneurship were less efficient but riskier than the alternative, A's propensity to continue could be too high. Moreover, the distortions need not relate to career choice; other actions A feels bound to take, or avoid, due to social debt but deems ex ante unappealing also exemplify the point.

When (9) and (10) hold, project funding is efficient despite the absence of formal contracts, but when only (9) holds, A does not seek funding from F unless $q\left(R - I + \bar{R} - C + \phi W\right) + (1-q)\,\phi\,(W - I + L) \geq \left(\bar{R} - C\right) + \phi W$. This inequality simplifies to

$$qR \geq I + (1-q)\,S, \tag{11}$$

where $S \equiv \bar{R} - C - I + \phi\,(I - L)$. For $S > 0$, this condition is stricter than $qR \geq I$ (**A1**). There are parameters consistent with **A2**, **A3**, and (9) such that $S > 0$ holds, but not (10).[10] Intuitively, when (11) is violated, A does not seek funding from F because—and this is the second example of our main point—the threat of social distortions outweighs the monetary prospects.

Let us now introduce formal contracting (but not yet O) in that we allow contracting over cash flows at time 1. The events after time 1 remain non-contractible. The main question is whether formal contracts mitigate the aforementioned frictions. The career distortion, which we refer to as *social debt overhang,* is immune to formal contracting; it is the result of social pressure that arises from the threat of broken relationships. No formal contract or court can relieve such pressure.

[10] $S > 0$ holds when $\bar{R} - C \geq I - \phi(I - L)$, which is weaker than (10). For $\bar{R} - C \to I^-$, which is consistent with **A2**, **A3**, and (9), $S > 0$ holds in the limit, but not (10).

Frictions that arise from strategic default at time 1, which we call *social bankruptcy*, can be curtailed by formal contracts. Social bankruptcy is a threat when social incentives are too weak to enforce repayment. Here, formal enforcement can protect the friendship, and thus help finance the project when a violation of (9) impedes a purely informal transaction. Consider again the case of $\phi W < L$. In this case, the social collateral is too weak to enforce repayment; F does not finance A informally. Under a formal contract, however, F is paid if the project succeeds, irrespective (of the strength) of social collateral. With formal contracts, F's participation constraint is then

$$W - I + q\left[R_F + \phi\left(\bar{R} - C\right)\right] + (1-q)\,0 \geq W + \phi\left(\bar{R} - C\right), \tag{12}$$

which yields $R_F \geq \frac{I+(1-q)\phi(\bar{R}-C)}{q} \equiv \underline{R}_F$. Note that F prices in the fact that her friendship may still suffer if the first project fails. A's participation constraint is

$$q\left[R - R_F + \bar{R} - C + \phi\left(W - I + R_F\right)\right] + (1-q)\left(\bar{R} - C\right) \geq \bar{R} - C + \phi W, \tag{13}$$

which yields $R_F \leq \frac{qR-\phi I-(1-q)\phi(W-I)}{(1-\phi)} \equiv \bar{R}_F$. A also takes into account the fact that the friendship may still suffer. If $\underline{R}_F \leq \min\left\{R, \bar{R}_F\right\}$, the project is financed, and otherwise not. Formal contracting can enable funding because it reduces the probability of social bankruptcy to $1-q$. By the same token, it cannot always do so because it does not eliminate the threat completely.

Last but not least, let us introduce O. A formal contract with O eliminates all distortions: A can raise I from O and repay $R_O = I/q$ if the project is successful. This satisfies O's breakeven constraint and implements the first-best outcome.

We summarize the above insights in the following result.

Lemma 2. *Absent private benefit consumption, A (weakly) prefers funding from O.*

The advantage of funding the project through O is that A neither risks a friendship nor incurs social pressure that distorts future decisions. It sidesteps social frictions.

3.3 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

$$qR \geq I + B. \tag{14}$$

When (14) is satisfied, any (efficient) project is financed.

As in our analysis of the social risk model, we can compare the situation represented by (14) 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 (14) hold and let $\phi W < L$. Without formal contracting, we show above that the project is not undertaken if $\phi W < L$. Now suppose formal contracting is available but O is still absent. Then the project is financed if $\underline{R}_F \leq \min\left\{R, \bar{R}_F\right\}$, as derived above, *and* if, furthermore, the incentive compatibility constraint $q\left[R - \underline{R}_F + \bar{R} - C + \phi\left(W - I + \underline{R}_F\right)\right] + (1-q)\left(\bar{R} - C\right) \geq B + \bar{R} - C$ is satisfied. This constraint can be simplified to $qR \geq I + B + K$ with $K \equiv \phi\left[(1-\phi)(1-q)\left(\bar{R} - C\right) - W\right]$. For $K < 0$, which is true for $\bar{R} < C + \frac{W}{(1-\phi)(1-q)}$, this incentive compatibility constraint is implied by (14). There exist parameters consistent with **A1-A3**, (14), and $\phi W < L$ such that both $\underline{R}_F \leq \min\left\{R, \bar{R}_F\right\}$ and $K < 0$. (To see this, let $\phi \to 0$ and $q \to 1$.) For such parameters (only), the project is formally funded by F. Last, introduce O. Given (14), all (efficient) projects are now financed. Analogous arguments can be applied for the case where (14) and (9) hold but (11) is violated. □

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, (14) 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 (14) be violated. Suppose (9) and (10) hold. As discussed above, this means that A would repay F the amount I voluntarily and make an efficient career choice. We note that F can thus expect to be repaid I in any event, even without a formal contract. A's incentive compatibility constraint is then $q\left(R - I + \bar{R} - C + \phi W\right) + (1-q)\left(\bar{R} - I - C + \phi W\right) \geq B + \bar{R} - I - C + \phi W$ collapses to $qR \geq B$. This is always satisfied (**A1**). Thus, the project can be efficiently financed by F. There exist parameters consistent with **A1-A3** and the opposite of (14) such that (9) and (10) hold (e.g., sufficiently large W and $\bar{R}$). Consider two further

examples. First, suppose (9) but not (10) holds. A's incentive compatibility constraint is then $q\left(R-I+\bar{R}-C+\phi W\right)+(1-q)\,\phi W \geq B+\phi W$, which collapses to $qR \geq B+q(I-\bar{R}+C)$. There exist parameters consistent with **A1**-**A3**, (9), the opposite of (14), and the opposite of (10) such that this holds. (To see this, let $W \to \infty$ and $\bar{R}-C \to I^{+}$.) Second, suppose $\phi W < L$, which violates (9). Then A's incentive compatibility constraint is $qR \geq I+B+K$ (see the proof of Proposition 4). There exist parameters consistent with **A1**-**A3**, $\phi W < L$, and the opposite of (14) such that this holds. (To see this, let $B \to (R-I)^{+}$, $\phi \to 0$, $q \to 1$.) □

Proposition 5 highlights the fact that social frictions can improve matters. The threat of losing F's friendship, or social collateral, can strengthen incentives via three channels. First, it can enforce repayments where formal institutions fail. This de facto reduces limited liability, thereby raising pledgeable income and incentives. Second, since social debt can distort future decisions, it creates incentives to avoid failure. Third, even if the threat fails to exact informal repayment, failure remains undesirable since it would then harm the relationship. 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 the social risk model. On one hand, formal finance facilitates investment by reducing the risk of social frictions. Such risks arise because (exogenous) failures can create social bankruptcy or social debt overhang. On the other hand, family finance facilitates investment by improving ex ante incentives. So again, formal finance is a source of risk capital, and family finance a source of trust capital.

This puts a social twist on 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 weakly optimal for A to sell only so much cash flow to F that his incentive compatibility constraint binds and to sell the remaining cash flow to O.*

Proof. Funding from F creates potential social frictions if one or both of the following conditions are violated: (i) $R_F \leq \phi W$, which ensures repayment, and (ii) $\bar{R}-C-R_F \geq (L-R_F)^{+}$, which ensures efficient career choice. Both conditions limit R_F from above. Thus, conditional on formal funding, increasing R_F can only aggravate (the risk of) social frictions. □

Sometimes the ability to raise risk and trust capital in tandem may even be critical. For example, let (14) be violated so that A cannot fully fund the project through O and, further, let $\phi W < L$ so that A cannot fully finance it through F either. If the project can be financed at all, it can only be through a combination of funding from O and F. A possible solution is to sell a claim of just $R_F = \phi W$ to F. A would and could repay this amount voluntarily, irrespective of his career choice; moreover, that choice would not be distorted, since $R_F < L$. In other words, A treats $R_F = \phi W$ as if it came out of his own pocket, so that his incentives depend only on his funding from O, $I_O = I - \phi W$ and $R_O = I_O/q$, which yields the constraint

$$qR \geq I + B - \phi W. \tag{15}$$

This is weaker than (14). Thus, there exist projects that are feasible only with a combination of formal and family finance.

4 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.

4.1 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.

A4. $R'(I) > 0$.

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.

A5. $q\left[R(I) - \frac{I}{q}\right] - I < B(I)$ for all $I \in (0, \infty)$.

This assumption effectively says that, irrespective of size, O will not fund a project without some means of disciplining A. (Projects not subject to **A5** 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*.[11]

4.2 Size and social risk aversion

Suppose each entrepreneur's financial environment in this economy is described by the social risk model in Section 2. 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

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

Given $R'(I) > 0$, this term is negative for all and only 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 2).

Figure 2

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,

[11] 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.

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.[12]

Finally, as in Section 2, 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, since the presence of family finance ensures proper incentives.

4.3 Size and social frictions

Now suppose the entrepreneurs' financial environment is described by the social debt model in Section 3. Recall that the cost of family finance there stems from two potential frictions: First, there is the risk of *social bankruptcy*; if the repayment constraint (9), $\phi W \geq I$, is violated, the transaction may end up damaging the social relationship. Second, there is the risk of *social debt overhang*; if the "future effort" constraint (10), $\bar{R} - C \geq I$, is violated, the transaction can create social debt that distorts future decisions by A. Both constraints impose upper bounds on I. Thus, as in Section 4.2, family finance is less efficient for larger projects.

Figure 3

To make our point in the simplest manner, we focus on the repayment constraint and a very stark comparison, namely, that between family finance without formal contracting and formal finance. So we let $\bar{R} - C > W$, which implies that (9) is a tighter constraint than (10). In this case, family finance without formal contracts is feasible if and only if (9) holds. If (9) holds, A will fully repay F whenever he can. Moreover, since (9) implies (10), A's career choice is unaffected, in which case he is always able to fully repay F (**A2**). Conversely, if (9) is violated, A will refuse to repay F because the social collateral is not strong enough, and

[12] 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.

their relationship will suffer. In this case, F anticipates losing both money and a friend and is therefore unwilling to finance the project. Under these assumptions, the maximum project size that F will fund is simply $\bar{I}'_F = \phi W$. By contrast, formal (monitored) finance requires a minimum project size $\underline{I}_O$, as defined in Section 4.2 (see Figure 3).

The fixed cost of monitoring induces a lower bound on project size under formal finance, as before; 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 may lead to not only broken promises but also broken relationships. This puts a limit on the stakes that the friendship can support in the transaction.

If the binding constraint is (10) rather than (9), the logic is different but the consequence remains the same. In that case, larger projects, should they fail, create a larger social debt. A larger social debt, in turn, has a greater distortionary effect on the debtor's actions. If too great, the anticipated distortions can render the transaction between friends unattractive.

Again, combining formal finance and family finance can improve matters. As discussed in Section 3, A could seek $I_F = \bar{I}'_F$ in funding from F, just enough to preclude social frictions. This would reduce the amount of money that must be raised from O, possibly so much so that A's incentive compatibility constraint will not be violated. If so, A can fund projects larger than $\bar{I}'_F$ without having to compensate O for monitoring costs.

5 Discussion

5.1 Microventure capital

In emerging economies, policy makers often speak of the "missing middle," or the "financing gap," referring to three connected facts (IFC, 2009): First, the SME sector is usually bottom heavy. Second, while microenterprises and large corporations can tap microfinanciers and banks, respectively, the middle segment lacks adequate financial services. Third, most microenterprises use funds for safe purposes (e.g., as working capital) but seldom for larger or riskier investments. As a result, they show little growth.

Microfinance, while heralded as the solution, has had only limited success as a source of *entrepreneurial* finance. Based on this, Banerjee and Duflo (2010, p.181) state in *Poor Economics* that "finding ways to finance medium-scale enterprises is the next big challenge for finance in developing countries." For this, we must understand why microenterprises lack growth capital. It is widely agreed that the main obstacles for banks in serving microclients

are enforcement and information problems, as well as the transaction costs of dealing with small clients. Much less discussed is why family finance and microfinance have (so far) been inadequate sources of entrepreneurial finance.

Regarding family finance, this paper argues that the reason is not merely scarcity but, rather, aversion to social risk and fear of social frictions. Actual diaries of how poor households run their finances, corroborate this hypothesis (Collins et al., 2009). First of all, they document that while the poor "manage a collection of relationships and transactions with others—family, neighbors, money-lenders, and savings clubs, ... the most important providers of loans are not moneylenders but friends and neighbors" (p.14).[13] Indeed, "almost every household borrowed informally from family and friends, and many, including the very poor, reciprocated by offering such loans to others" but "many of the diarists told [the authors that] they found informal transactions unpleasant but unavoidable" (p.16). In the words of one of the diarists, they "don't really like having to deal with other people over money" (p.13).

A central point emerging from the diaries is that the fundamental needs underlying such financial activity are to ensure *regular* and *dependable* cash flows for basic needs and to *manage risks*, because a sudden emergency can "derail families with little in reserve" (p.18). Indeed, uncertainty is the overarching concern:

> 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. (p.18)

One way the poor deal with the risks they (already) face and the anxiety is to be conservative; that is, they take few risks.[14] Our theory posits that this is true not only with respect to their own money, but also with respect to the money of the people they care about, because, for one, they face the same harsh reality and failure to repay can seriously harm them. Collins et al. (2009, p.54) call this "one of the greatest tensions in the financial lives of the poor: the people best placed to help—neighbors and family members—are typically poor themselves."

[13] This conclusion—that most financial activity in developing economies occurs among friends and relatives—was already drawn in the 1989 World Development Report (p.112).

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

Moreover, the diarists report that risking other people's money under such circumstances can damage valuable relations:

> 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. 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. (p.55)

Thus, funds from social relations primarily serve safe purposes, or act as insurance rather than risk capital. Indeed, ample empirical evidence shows that intra-family transfers help poor households smooth consumption (e.g., Udry, 1996) and provide insurance (Ambrus et al., 2010), quite the opposite of providing funds for *risky* ventures.

To "bank" the poor, some microfinance programs bring the power of social relations into play to extract information, harness social sanctions for repayment, or reduce collection costs. But they often do so by imposing joint liability, which makes "zero default" imperative, since defaulting group members induce strategic defaults by others and can damage social relations within the group. But intolerance of failure is antithetical to providing *risk* capital (Banerjee and Duflo, 2010, Chapter 6).

To more effectively address the "missing middle," a new breed of microfinance, specializing on SME financing for the poor, is on the rise, with microventure capital funds such as Aavishkaar, Acumen Fund, E+Co, the Grassroots Business Fund, and Root Capital.[15] Our analysis suggests an *intermediated social finance* approach to the provision of such capital. The guiding principle is to both use social relations for incentives and protect them through formal intermediation. The following is a tentative proposal; it seeks to elicit social incentives but limits downside social risks and frictions for entrepreneurs:

> 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

[15] *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.

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.

5.2 Formality as innovation

While the existing literature on social ties in financial contracting, almost without exception, stresses the "value added" of social ties, our analysis naturally focuses on the benefits of not having to rely on social ties, that is, the value added of formality. Arguably, to view formality as the innovation is historically correct: Family finance probably preceded formal finance. As is still often the case, absent formal institutions, transactions occur within the confines of social relations. Formal enforcement allows people to transact with others beyond their immediate social spheres. One benefit of this is access to more potential counterparties. We argue that there is another key advantage: Formal finance avoids disutilities that can arise from imposing risk on friends and family.

Consider the following passage:

> 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.[16]

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

Between the lines, this excerpt 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 limit "indebtedness" is less obvious. Yet the evolution of formal finance very much reflects this rationale. In ancient history, the norm for all loans—including formal ones—used to be personal liability.[17] But already then, there was an awareness that unlimited liability could be harmful. Deuteronomy 15:1-2 says,[18]

> 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 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. (117)

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, followed by decades of legislative bargaining about bankruptcy law. In his book on the evolution of bankruptcy law, *Debt's Dominion*, Skeel (2003, p.26) cites a famous speech by Daniel Webster that articulates a key concern behind this legislative process, namely, that persistent debt is counterproductive::

26, 2012.

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

[18] Asking why any lending occurred under these circumstances, Atwood (2008, p.48) interestingly submits: "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.

> 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 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; and if he attempts any thing for the purpose of obtaining food and clothing for his family, he is driven to unworthy shifts and disguises, to the use of other person's names, to the adoption of the character of agent, and various other contrivances, to keep the little earnings of the day from the reach of his creditors.

This legislative process gave rise to the modern legal approach to bankruptcy, which, with its leniency toward debtors, marks an evolution from personal bondage to limited liability. We argue that this is a key innovation distinguishing formal finance from finance based on social relations. 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.[19] Formal finance can thus eliminate liability when social obligations would persist and, by the same token, enforce liability when social incentives have no bite.

Personal finance and small business finance websites therefore recommend that even transactions between family members or friends be formalized. A number of professional intermediaries specialize in arranging, structuring, and servicing so-called friends and family loans, such as LendFriend, Lending Karma, LoanBack, One2One Lending, WikiLoan, ZimpleMoney, Prosper, Bainco, and National Family Mortgage. Consider the following advertisement for such a service:

[19] 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*.

> 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]

In sum, formal finance allows for a *contractual* design of liability, which is more flexible than the *social* obligations under family finance. Conversely, the strength of family finance is that it can enforce payments when legal enforcement is too weak or absent. That social obligations cannot credibly be finetuned ex ante is an exogenous assumption in our model, but we will motivate this assumption in Section 5.4.2.

5.3 Testable predictions

The social risk model and social debt model have common and distinct predictions. Moreover, in some cases, the predictions under perfect information deviate from those under imperfect information. First, we have shown in both models that the entrepreneur refrains from certain risky investments unless he has access to formal finance or formal contracting.

Risk taking. In both models, formal finance encourages risk taking. A natural model extension would reinforce this prediction: If A could choose among projects with different risk after raising finance, he would take larger risks with formal funding.

Pecking order. In both models, under imperfect information, more profitable risky borrowers use less family finance. For one, if feasible, formal finance is preferred to family finance by any entrepreneur. Further, formal finance is more likely feasible for better projects.

Certification. In both models, under imperfect information, the availability of family finance increases access to formal finance. Family finance is a catalyst for formal finance because it improves the entrepreneur's incentives. Their own wealth aside, entrepreneurs in more affluent social networks should thus have better access to formal finance.

Social friction I. In the social debt model, family finance leads to inefficient entrepreneurial decisions following a failure. Our model considers how social obligations create a debt overhang problem, but it could also focus on a risk-shifting problem instead. The general claim is that family finance can lead to distortions in future decisions.

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

Social friction II. In the social debt model, formal finance and formal contracting protect social relations. Conversely, default under family finance can damage the very social relations that the transaction is based upon.

Missing middle. In both models, family finance imposes an upper bound on project size, since larger projects involve a larger social risk and a larger risk of social friction. In contrast, monitored formal finance imposes a lower bound on project size if monitoring larger loans is cheaper per dollar.

5.4 Robustness

5.4.1 Social risk model

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 2, 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 that 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 2, only A is risk averse. We could alternatively assume either that F is also risk-averse or that everyone, including O, is risk averse. In the former case, family finance would be superior to formal finance from the perspective of risk allocation, even in the absence of social risk. Our specification rules this out to isolate the impact of social risk. In the latter case, very 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. Thus, the conclusions we draw are rather robust. Note that the advantage of formal finance does not rely on any difference in risk aversion between F and O (as, e.g., in Stiglitz, 1990).

5.4.2 Social debt model

The key assumption of the social debt model is that the altruism between A and F decreases, independent of formal contractual agreements, if A refuses to recompense F for a past shortfall although he can. This is how Section 3 specifies the fragility of friendship. Alternatively, we could assume that the altruism is sensitive also to other decisions and outcomes as well. For instance, the friendship may suffer if A distorts his career decision or simply as a result of

project failure. In the first case, social debt overhang may no longer be a concern; however, social pressure may, in that case, push A to decisions that increase payout to F but are not ex post efficient. For instance, F may expect A to take on a job that pays a lot over a job that gives A greater personal satisfaction. The point that social obligations can distort behavior would thus remain. Moreover, in any case, social bankruptcy remains a concern.

We can also assume that if F sees A's project decisions and A consumes private benefits, she will renounce her friendship. If sufficient, this threat amounts to a commitment against private benefit consumption, but this does not eliminate the subsequent possibility of social debt overhang or social bankruptcy, which persists as long as the friendship remains vulnerable to the repayment decision in time 3. 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 de facto 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 proactively 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, the conclusions we draw seem robust to alternative specifications. The key premise is that the fragility of friendship ex post cannot be finetuned ex ante. If this were possible, social relations would be de facto formal contracts, only better enforced. On second thought, though, the rigidity has purpose. If contractible, the loss of friendship should be renegotiable as well. In our model, it would be renegotiated ex post, since it is a deadweight loss. But this in turn renders the threat of losing a friend an empty one, undermining the positive ex ante incentive effects. Thus, the rigidity of the emotional response underlying the loss of friendship is the *source* of commitment. This is consistent with one of the leading evolutionary theories of emotions in social psychology, according to which emotions have evolved as commitment devices (see Haselton and Ketelaar, 2006, and the references therein).

5.4.3 Adverse selection

Our model uses moral hazard as the particular 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.

6 Conclusion

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 5.1. 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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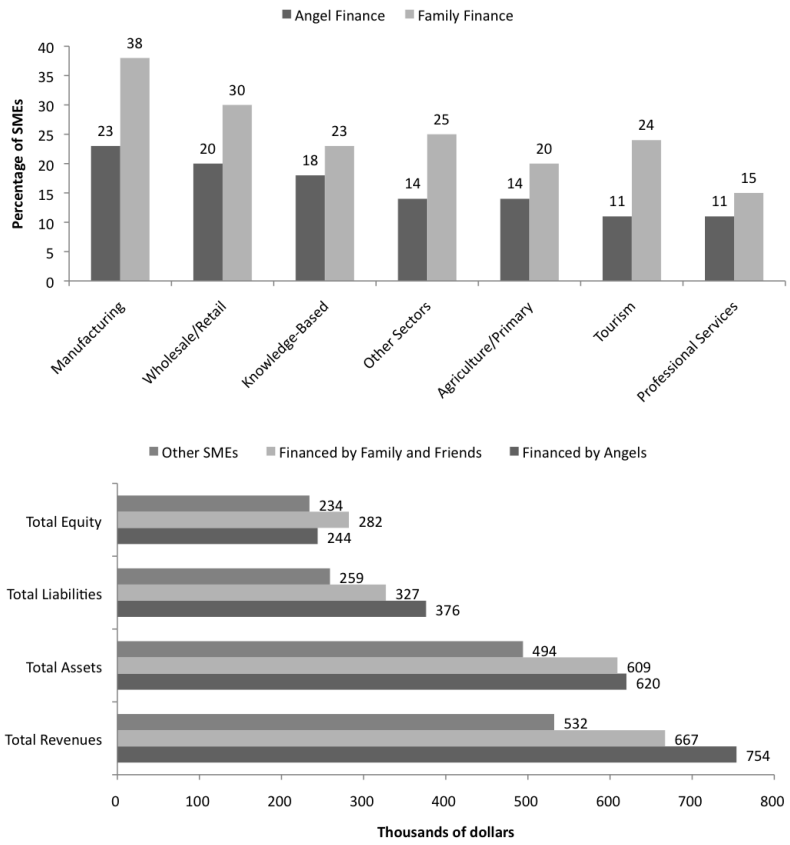

Figure 1: From the SME Financing Data Initiative, Statistics Canada, Survey on Financing of Small and Medium Enterprises, 2004.

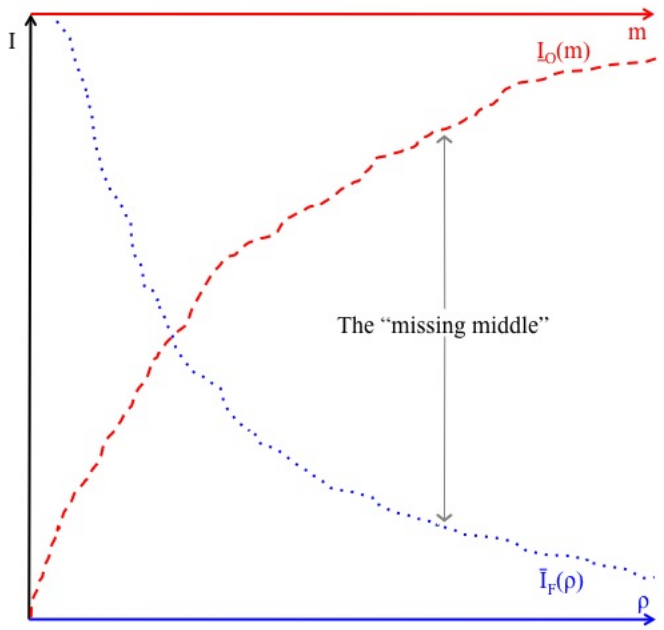

Figure 2: Project size (I) is depicted on the vertical axis, the entrepreneur's risk aversion (ρ) on the bottom horizontal axis, and the formal investor's monitoring cost (m) on the top horizontal axis. The dotted line depicts the maximum project size under family finance as a function of risk aversion, $\bar{I}_F(\rho)$. 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).

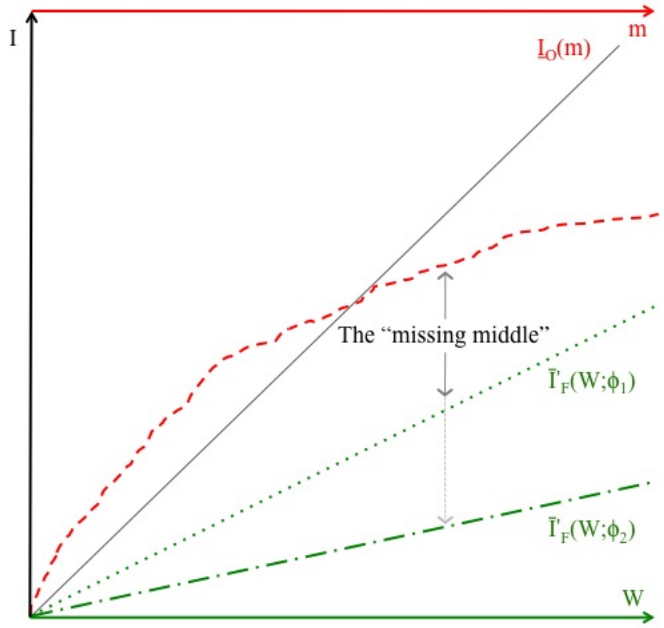

Figure 3: Project size (I) is depicted on the vertical axis, the family investor's wealth (W) on the bottom horizontal axis, and the formal investor's monitoring cost (m) on the top horizontal axis. The solid diagonal is the 45 degree line. The dotted and dashed-dotted lines depict the maximum project size under family finance as a function of the family investor's wealth for two altruism parameters, $\bar{I}'_F(W;\phi_1)$ and $\bar{I}'_F(W;\phi_2)$ where $\phi_1 > \phi_2$. 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 or dashed-dotted line but below the dashed line are capital constrained (the missing middle).