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Financing from Family and Friends

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Abstract

The constraint on informal finance is commonly taken to be high costs and limited supply. But the majority of informal investors—family and friends—is often willing to supply funds at *negative* returns, and yet many borrowers tap family and friends only as a last resort. We explain this paradox with a theory based on altruistic ties between the entrepreneur and his family and friends, and propose an alternative explanation of the limits of informal finance: Altruistic ties reduce agency problems in financing. But such ties also increase the entrepreneur’s aversion to failure. This makes financing from family and friends unattractive, and undermines the entrepreneur’s willingness to take risks. Altruistic ties thus constrain growth even though they relax financing constraints. We relate this insight to the limited success of group-based microfinance in generating entrepreneurial growth. Our theory underscores the value of *impersonal* transactions, and implies that even counterparties with social ties benefit from formal contracts and third-party intermediation. This sheds light on social-formal financial institutions, such as community funds, crowd funding, and social lending intermediaries.

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

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

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

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

1 Introduction

Compared with developed ones, developing economies typically have a top and bottom heavy firm size distribution. A concern is that the shortage of small and medium-sized enterprises (SMEs), sometimes called the “missing middle,” is related to the lack of economic growth.¹ One proposed explanation of the missing middle pertains to finance. A reason for that is the correlation between firm size and source of finance: While the largest firms use formal finance, the smallest firms rely heavily on informal finance. This observation has prompted the hypothesis that there is insufficient access to finance in-between, be it formal or informal, and that this financing gap causes the missing middle.

Figure 1

While this has led to widespread efforts to expand access to formal finance, it also raises questions about the funding that *is* available to small firms. According to survey estimates from the Global Entrepreneurship Monitor (GEM), several million companies in 42 countries received \$600 billion from 208 million informal investors in 2006 (Bygrave and Quill (2006)).²

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

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

How can informal finance exist where formal finance cannot? And given that, why does it not close the financing gap? The standard answer to the first question is that informal investors have superior information or enforcement possibilities that reduce contracting frictions such as adverse selection or moral hazard. These advantages allow them to lend to borrowers that formal investors do not trust. The standard answer to the second question is that informal investors have insufficient funds or, for various reasons, a very high cost of capital. In short, supply is limited and costly, and it is this lack of supply that constrains growth.

Table 1

This seems accurate for informal moneylenders who charge enormous interest rates. But the bulk of informal finance comes from family and friends, and certain aspects common to financing from family and friends—henceforth, simply, family finance—are at odds with this account. To begin with, family finance is rather cheap. In fact, the price is often negative. Many of the informal investors in the GEM studies willingly accept low or negative returns (Bygrave (2004): 17), and family finance among the poor is frequently interest-free (Collins et al. (2010): Chapter 2).³ As the Wall Street Journal (2012) writes, many startups turn to the “Bank of Mom or Dad” for a “dream-come-true interest rate.”⁴ If family finance comes with fewer agency problems *and* lower prices than formal finance, one would expect borrowers to prefer and exhaust it. That is, it should be the first resort.

Figure 2

Paradoxically, it often is not. Many borrowers dislike using family finance and eschew it when possible. Consider the following passage from Collins et al. (2010: 55), who conducted a panel survey of financial practices in developing economies and found that family finance, while being the most prevalent and usually cheapest form of (informal) finance, is frequently not the most preferred:

³Figure 2 shows not only that many informal investors in the GEM survey were willing to accept negative expected returns but also that the entrepreneurs they financed expected substantially higher returns. These observations together challenge the notion that the informal investors invest in entrepreneurs because, relative to formal investors, they have favorable private information or because there is less asymmetric information between them and the entrepreneurs.

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

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.

In the GEM studies, the largest informal financings involve strangers, not relatives or friends, even while the investor's required return rises with her social distance to the entrepreneur. As the most likely reason, the survey cites *not* a 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). Similarly, business experts urge entrepreneurs to "think twice before borrowing from family" and see family finance as "a last resort, not a first resort" (BusinessWeek (2006)), even while acknowledging that it is cheap and less prone to agency problems.

This raises the question whether anything else, other than lack of supply, might impose a constraint on family finance as a driver of entrepreneurship. A recent debate is interesting in this respect: Allen et al. (2005) argue that, given the absence of a well-developed formal financial system, China's private sector growth has substantially relied on informal finance. Probing into survey data of 2,400 Chinese firms, however, Ayyagari et al. (2010) find growth to be concentrated among the (minority of) firms that use bank finance.⁵ Importantly, when addressing the issue of endogeneity—more promising and larger firms may have better access to bank finance—they find that the positive relationship between formal finance and growth survives in three instrumental variable specifications (and in one of them is even stronger). The implied *causal* interpretation that, aside from access to finance, the *type* of finance per se—formal or informal—can impact business growth leads the authors to question whether informal finance can be a significant driver of firm growth in developing countries.

Our objective in this paper is to propose a simple theory that jointly explains the aforementioned aspects: family finance is prevalent among small firms, it often comes at giveaway

⁵In addition, they report (Table 7, Panel B) and discuss (3090) the following results: Business growth is associated with neither of two measures of "self-financing," one of which includes family finance; one of the self-financing measures is associated with a higher profit reinvestment rate, but this is mainly driven by the inclusion of internal financing (rather than family finance) in the variable; the same measure is also associated with increases in productivity, which suggests that internal and family finance leads to more efficiency; but these correlations with reinvestment and productivity occur only in the *smallest* quintile of firms.

prices, yet many borrowers are averse to it, and it may impede firm growth. We argue that a *single* aspect of social ties can coherently account for all these aspects: kinship and close friendship exhibit two-sided altruism. Clearly, altruism can explain how family finance mitigates agency problems and why family investors may accept negative returns, both of which would explain why family finance prevails in markets that formal financiers refuse to serve. However, it can also explain why a borrower may dislike family finance. He may be averse to imposing risks on family or friends, and more, afraid of repercussions for his relationships with them. For such reasons, he may prefer formal finance despite the lower required return on family finance, especially when he is unsure whether he will be able to return the funds. Moreover, since these concerns increase with risk, the borrower is less willing to take chances with family finance. Indeed, we will argue that, because of such concerns, entrepreneurs are inclined to forgo large risky investments rather than fund them through family and friends. This curtails the usefulness of family finance for entrepreneurial risk taking and growth, and thus its potential to close the missing middle. Put differently, while altruistic relations make family finance a good source of *trust capital* and thus indispensable in many cases, they also make it a poor source of *risk capital*.

We build on a moral hazard model of constrained lending close to Holmstrom and Tirole (1997), adding two-sided altruism between relatives or friends as the key distinction between family finance and formal finance. The assumption of altruism is often discounted as an easy “fix” in moral hazard models. However, not only is altruism a scientifically sound assumption for kin relations and friendships⁶ but its implications for financing are not trivial. First, this difference alone is sufficient to generate a trade-off: Altruism in our theory is not only the solution to a problem but also the source of such. Thus, even though we assume no differences in wealth, cost, or information to pit information advantages against cost disadvantages, we can replicate the following set of predictions that are common to other theories on the choice between formal and informal finance:

- (1) *Coexistence*. Borrowers use family and formal finance, some simultaneously.
- (2) *Deepening*. Family finance enables projects otherwise infeasible due to agency problems.

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

(3) *Assurance*. Family finance helps raise formal finance.

Second, our altruism-based theory yields a unique, additional set of predictions:

(4) *Negative price*. Family lenders may accept negative expected returns.

(5) *Pecking order*. Despite being cheaper, family finance is the last resort.

(6) *Risk taking*. Family finance deters risk taking.

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

What strikes us as remarkable is that, in the spirit of Occam’s Razor, all of these predictions are spawned by a *single* assumption in an otherwise standard model. Moreover, as we explain later, predictions (4) and (5), and to a large extent (6), do not obtain in the other theories and are amenable to empirical tests that would help discriminate our altruism-based theory from the others.

The basic friction in our workhorse model is that the entrepreneur may reduce the success probability of his project 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, how much of the cash flow he can pledge 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, which may be a more suitable assumption for strong family relations, and another in which the altruism can be affected by decisions of the entrepreneur, which may be a more suitable assumption for non-family friendships. 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, which 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 gives a false impression: family “debt” is hard to shake off, or put differently, seldom comes 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 in that he owes the family investor, possibly costly, favors and risks making her indignant by denying her such favors. Third, the absence of limited liability and the threat of social frictions make a default less appealing and hence reduce the moral hazard problem; the entrepreneur is less prone to consume private benefits. In this scenario family finance embodies another classic trade-off: it improves ex ante incentives at the risk of ex post frictions.⁷

Anecdotal evidence suggests that the concerns outlined in the two scenarios are salient in reality. Consider the following two quotes. The first speaks of the kind of altruistic concern that is key to the first scenario:

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

⁷This raises the question why the social frictions are not negotiated away ex post. Section 7.4 discusses this question and how it relates to commitment.

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

The second speaks of the social frictions that are key to the second scenario:

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

The consequence of either type of concern 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. Furthermore, these costs increase with risk, which makes family finance particularly unattractive for risky projects. Family-funded entrepreneurs may hence forgo risky projects, especially if the project 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.¹⁰ Both of these advantages imply that borrowers who seek to fund risky investments, such as those with entrepreneurial ambitions, benefit from formality per se.

This is most evident in the institution of *social* lending intermediaries, which are hard to explain using traditional theories of intermediation: They neither search for counterparties nor screen them, nor inject capital, nor disperse financial risk; they simply manage loans for a fee. Consider this advice from *Entrepreneur* magazine:

If you’re intent on raising money from friends and family, proceed with your eyes open. And one excellent path to take is to structure the money as a loan and use CircleLending to administer the loan. CircleLending administers loans between you and friends, but they keep the business and emotions separate . . . Raising money from friends and family seems attractive: potentially good rates, lenient credit standards, and a chance for your friends and family to share in the wealth

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

¹⁰A 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 7.4 discusses this point in more detail.

you create. Just make sure to manage the downside, and find any way you can to keep the love and affection firmly separated from the business transactions.¹¹

The point is that, as we will show also in our model, formal agreements and intermediaries can be optimal even between friends and relatives to mitigate the aforementioned concerns. This insight is relevant to group-based funding schemes. Investors who want to harness the power of social relations for financing microenterprises must take into account that this can endanger those relations and mute the entrepreneurs' incentive to take risks. The challenge is then to structure such finance in a way that leverages the trust generated in social relations while minimizing the risk imposed on them. In Section 7.3, we discuss how the idea behind social lending intermediaries could be applied to group-based micro venture capital.

2 Related literature

2.1 Theoretical literature

The existing literature suggests two reasons for why social ties relax financing constraints. One explanation focuses on information advantages: Informal lenders have superior information or lower monitoring costs, which reduce moral hazard, state verification, or adverse selection costs (Stiglitz (1990), Varian (1990), Banerjee et al. (1994), Jain (1999), Mookherjee and Png (1989), Prescott (1997), Gine (2011), Ghatak (1999)). The other explanation is that social ties reduce moral hazard via the threat of social sanctions, modeled as a cost to the defaulting borrower (Besley and Coate (1995), Besley et al. (1993)). In a recent paper, Karlan et al. (2009) embed such sanctions in a social network model where social ties serve as social collateral and show how the network structure influences transactions. To create a trade-off, existing theories on the choice between formal and informal finance additionally assume that informal financiers have a higher cost of capital because of monitoring costs, risk aversion, or illiquidity. While the above models are able to describe many aspect of informal finance, they cannot explain the negative prices common in family finance, that borrowers may opt for formal finance even when they could obtain family finance at a lower required rate of return, or formal intermediation between relatives or friends. Our paper is also the first to argue that family finance discourages entrepreneurial risk taking.

¹¹See <http://www.entrepreneur.com/article/44612>, retrieved 16 May 2012.

In general, the existing literature has focused only on the advantages of social ties, that is, how social ties facilitate financing but not on the possible downsides of social incentives. For example, Ghatak and Guinnane (1999: 221) write in their survey that “the literature on group lending shies away from discussing the possible negative implications of peer pressure.” In contrast, our altruism-based theory stresses the negative consequences of social relations in financial transactions and the advantages of formal contracts and arm’s-length relationships.

Existing theories of family firms model the family as a unified entity (Burkart et al. (2003), Almeida and Wolfenzon (2007)), though recent papers examine governance issues in settings where family members do not necessarily act in unison (Lee and Persson (2011), Noe (2011)). Similarly, the broader literature on family economics has moved from Becker’s (1973) *unitary* model of the household, which treats the family as a single decision maker, to the *collective* model of the household, which brings individual preferences, conflicts, and bargaining powers to the fore (see Browning et al. (2012) and the references therein). Nevertheless, even while emphasizing family conflict, the collective model assumes that the household always achieves Pareto efficiency. This assumption has been challenged empirically (e.g., Udry (1996), Duflo and Udry (2004), Ashraf (2009), Ashraf et al. (2010), and Schaner (2012)), and recent studies propose household models in which intrafamily conflicts entail inefficiencies (e.g., Konrad and Lommerud (1995), Lundberg and Pollak (2003), Basu (2006), and Hertzberg (2012)). We also posit that social ties can lead to inefficient outcomes, but the perspective is different: In our first scenario, the Achilles heel is the empathy, not the conflict, between family members;¹² in our second scenario, family transactions are problematic not because existing conflicts distort decisions, but because the transactions provoke future conflicts.

2.2 Empirical literature

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

First, there is evidence that (the success or failure of) financial transactions can affect social relations. Within the context of group lending, Montgomery et al. (1996) recounts real-

¹²The only other claim we have found to the effect that altruism causes problems is a conjecture in Schulze et al. (2001) that altruistic ties between family members may soften, rather than strengthen, discipline. 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*.

world examples where the reliance on peer pressure damaged relationships ex post and even provoked violence, and Karlan (2007) reports systematic evidence that the relationships between group members deteriorate after default. Complementing these findings, 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. In the context of family finance, Rosenblatt (1991) provides examples of social tensions rising as economic difficulties endanger the financial arrangements.

Second, recent studies indicate that social preferences can create “social risk aversion.” Using a sample of private firms across Europe, Belenzon and Zarutskie (2012) show that family firms are more stable and liquid but also tend to grow more slowly. Moreover, these characteristics especially distinguish family firms that are at early stages of their life cycle and jointly owned by a married couple.¹³ The authors conclude that family ties, particularly marital ties, lead to higher operating efficiency and more conservative liquidity management, which reduces failure but also dampens investment and growth. Romano et al. (2000) find that small businesses are less likely to utilize family finance when pursuing growth through new products or new process development. Saidi (2012) reports evidence from Amazonian hunter-gatherer societies that villagers who practice cross-cousin marriage, and are therefore more socially connected, provide each other with more informal finance but also invest their resources in more traditional assets and safer activities. More direct evidence on “social risk aversion” comes from a large-scale internet experiment on delegated risk taking by Andersson et al. (2012), who find that pro-social preferences reduce a subject’s inclination to take risks on behalf of others.

Third, while there is anecdotal and survey evidence that many borrowers are averse to family finance (e.g., Collins et al. (2010)), we know of no direct evidence from data on firm financing. However, using the Kauffman Firm Survey, Robb and Robinson (2012) find that the startups in their sample rely much less on funding from family and friends than expected, and much more on bank financing. 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

¹³Some other studies on family firms discuss more generally the idea that family involvement can have a “dark side” (Schulze et al. (2001), Bertrand and Schoar (2006), Bertrand et al. (2008)). Bertrand and Schoar (2006) report empirical patterns consistent with the idea that “family values” negatively affect firm value, while evidence in Bertrand et al. (2008) suggests that conflicts between multiple heirs damage family firms.

reverses over time: as the firms age, they *replace* family finance with bank finance. Both of these observations are consistent with our theoretical prediction that entrepreneurs, though often dependant on family finance, prefer formal finance especially for risky investments and growth.

These empirical observations are indicative but do not sufficiently corroborate our theory. In Section 7.1, we therefore discuss empirical tests that could provide more direct evidence for (or against) our key empirical predictions.

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 $W \geq qR$.¹⁴ Both only demand to break even, and everyone discounts time at rate 0. Funds not invested with A are invested in a safe storage technology, thus focusing our analysis on the interesting case in which the project is riskier than the investors' alternative uses for their funds.

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 .¹⁵ Private benefit extraction comes at the expense of cash flows reducing them, for simplicity, to 0. We make the following parametric assumption.

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

¹⁴The assumption of risk-neutrality is not crucial. See footnote 16 and Section 8.1.

¹⁵We 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.

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

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

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

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

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

where $\phi \in (0, 1)$ is the degree of altruism.¹⁶

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 aspect of altruism that is central to our main insight.

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:

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

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

¹⁶We model altruism in terms of payoffs as opposed to utilities out of convenience. This modeling choice is not crucial for the results; as we discuss in Section 8.1, assuming that A and F internalize each other's utility yields similar results so long as (at least) *one* of them is risk averse.

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

$$I_F = qR_F. \quad (3)$$

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

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

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 since he is still concerned about the outcome.¹⁷ 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

¹⁷Note that A worries about risk imposed on F more than F minds the risk. Such paternalistic preferences also arise under alternative formalizations of altruism, as discussed in Section 8.1. However, the above insight does not rely on paternalism: Suppose O and F are risk averse and A internalizes their *expected* utilities. In this case, A partly internalizes F risk aversion, but not more than F herself, and he still prefers to transfer risk to O whose risk aversion he is indifferent to.

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 out, 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

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

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 $\rho q(1 - q)(R_A + \phi R_F)^2$, 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,

$$q(R_A + \phi R_F) - \rho q(1 - q)(R_A + \phi R_F)^2 \geq qB - \rho q(1 - q)B^2. \quad (6)$$

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, $q(R_A + \phi R_F)$, and disutility from his own and F 's exposure to risk, $-\rho q(1 - q)(R_A + \phi R_F)^2$. 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

$$R_A + \phi R_F = B. \quad (7)$$

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

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

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

$$W - I_F + qR_F + \phi [I_F - I + q(R - R_F)] = W \quad (9)$$

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 expected return when she is pivotal for realizing the project. This is because 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 $B \rightarrow 0$). \square

As spotlighted by Lemma 1, A dislikes exposing not only himself but also F to risk. In the absence of 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, to 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 $qR_F + \varepsilon + q(R - R_F - (B - \phi R_F)) = \varepsilon + q(R - B + \phi R_F) > q(R - B)$. \square

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 create financial deepening, that is, expand the capital market. The reason is that they relax different constraints: The former facilitates investment when risk aversion sets the binding constraint, and the latter 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. \square

Recall that A , eager to shed risk, wants to raise funding only from O but may be unable to do so 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 .¹⁸ Thus, 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 insofar as one may not be used without the other: A may not seek funding from F unless he can shift part of the 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. \square

¹⁸This point presumes that O knows the degree of altruism between F and A . In practice, such assurances (e.g., co-signing a loan) are therefore often restricted to persons that have apparent social ties to the borrower, such as close family members.

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 scenario in the same framework with but a few modifications. First, we dispense with risk aversion to throw out the channel studied above, and for cosmetic reasons, assume that the private benefit B is not risky. That is, A is now, like F and O , risk neutral, and his expected private benefit from shirking is simply B .

Instead, we extend the timeline to capture the following idea: There is a reciprocity norm 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.

To be specific, we add a time 2 at which A can pay F a favor. The favor imposes cost C on A and confers benefit G on F . If A defaults *and* denies F the favor, then ϕ drops, for simplicity, to 0.¹⁹ 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

¹⁹This is similar to what Karlan et al. (2009)’s model refers to as “social collateral,” the threat of losing which has a disciplinary effect. There are two differences: First, modeling the social collateral as an altruistic relationship and allowing the borrower to pay favors in order to salvage the collateral helps explain why family investors are willing to accept a negative expected financial return. Second, modeling costly favors, or better social obligations, allows for family finance to be ex post inefficient even if the relationship is salvaged.

absent a default, but when paid, will benefit F . Second, larger defaults call for commensurately larger favors ($G = R_F$).²⁰

Crucially, we assume that decisions on future favors are non-contractible and that relations can suffer even when the damage is 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 7.4 to discuss their importance and back them with insights from social psychology.

4.2 Social frictions

Again, to clarify the various 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 begin with an informal contract between A and F and then study the effects of introducing formal contracts and O . So, as a starting point, suppose there are no formal contracts, that is, no legal enforcement. In this case, O would never 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 originate from the threat of losing F as a friend if A can repay F but refuses to do so. Note that A prefers paying F money rather than favors because the favors are costlier ($C > R_F$). Therefore, if A refuses to repay the loan in money, he a fortiori refuses 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.²¹ 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 $W - I \rightarrow 0$. 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

²⁰The assumption that larger defaults on family loans lead to larger social obligations matters only for the result in Section IV.C, namely that family finance becomes less attractive with project size. For this effect, we only need that G increases with R_F ; the assumption that $G = R_F$ is a simplification.

²¹Repayment hinges on the fragility of the friendship. Fixed altruism cannot exact repayment for $\phi < 1$.

funding.²² This is one example—others will follow—of the central insight of this scenario: 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

$$\phi(W - I + R_F) \geq C \quad (11)$$

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

$$W - I + q[R'_F + \phi(R - R'_F)] + (1 - q)0 = W, \quad (12)$$

which yields $R'_F = \frac{I - q\phi R}{q(1 - \phi)}$. 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

$$W - I + q[R''_F + \phi(R - R''_F)] + (1 - q)(G - \phi C) = W \quad (13)$$

and yields $R''_F = \frac{I - q\phi R}{q(1 - \phi) + (1 - q)(1 - \phi a)}$ substituting $G = R''_F$ and $C = aG$ from **A2**. Also given **A2**, $R''_F < R'_F$ (because $G > \phi C \Leftrightarrow 1 - \phi a > 0$). That is, in this case, F is willing to accept an even more negative financial return, the reason being that the favor is de facto a deferred payment to F in the event of default.

Formality helps not only enforce monetary claims but also forestall social frictions. More specifically, when (10) is violated, a formal contract reduces the probability of social 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 $q[R - R'_F + \phi(W - I + R'_F)] - \phi W$, which can be written as

$$qR - I + q\phi(R - I) - (1 - q)\phi W. \quad (14)$$

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

²²If 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.

be written as

$$qR - I - (1 - q)(C - G). \quad (15)$$

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. So these are further cases in which A would not undertake the project with (only) family finance because the expected social frictions outweigh 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 both 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 no 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 $q(R - I/q) \geq qB$, or

$$R \geq I/q + B. \quad (16)$$

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 established above that family finance is infeasible 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 $q[R - R'_F + \phi(W - I + R'_F)] \geq qB$ or $q[R - R''_F + \phi(W - I + R''_F)] + (1 - q)[\phi(W - I + G) - C] \geq qB + \phi(W - I + G) - C$. After substituting $G = R''_F$ and $C = aG$, these two conditions can be rearranged to $R \geq B + (1 - \phi)R'_F - \phi(W - I)$ and $R \geq B + (1 - a)R''_F$, either of which is implied by (16) since $R''_F < R'_F < I/q$. When, in addition, (14) or (15) is positive, formal contracting renders family finance feasible. However, there also exist parameters consistent with **A1** and **A2** such that (16) holds but both (14) and (15) are negative. (To see this, let $(1 - q)\phi W \rightarrow \infty$ and $(1 - q)(C - G) = (1 - q)(a - 1)G \rightarrow \infty$.) For such parameters, family finance is impossible even with formal contracting. Finally, introduce O . Given (16), all (efficient) projects are now financed. \square

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 refuses 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, O alone does not finance the project. However, F alone would finance the project if (15) is positive and the incentive compatibility constraint $R \geq B - (a - 1)R''_F$ holds. First, note that this incentive compatibility constraint always holds under **A1** and **A2**; the favor eliminates limited liability and thus moral hazard. Next, note that there exist parameters consistent with **A1** and **A2** such that (11) holds, (15) is positive, and (16) is violated. (To see this, let $W \rightarrow \infty$ to satisfy (11), $qR - I - B \rightarrow 0^-$ to violate (16), and $C - G \rightarrow 0$ to ensure that (15) is positive.) \square

Proposition 5 highlights that social frictions can improve matters. The threat of losing F 's friendship strengthens incentives via two channels. First, it exacts repayments formal contracts cannot enforce, which de facto undermines limited liability. Second, it increases A 's incentives to succeed because a default provokes social frictions, in the form of either 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 decreasing risk, albeit in this case the risk of social frictions. On the other hand, family finance facilitates investment by improving incentives. Again, formal finance is a source of risk capital and 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 yields 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 . Of course, the smaller I_F , the smaller R_F . Writing (11) as $\phi(W - I_F) \geq (a - \phi)R_F$, we see that this condition is less likely to be violated for smaller I_F and R_F , since $a > 1 \geq \phi$. Further, A ’s expected gain from financing the project when (11) holds is $qR - I - (1 - q)(a - 1)R_F$, which is decreasing in R_F . Thus, A benefits from reducing I_F , and thereby R_F , either if it helps satisfy (11) or if (11) is already satisfied. If (11) cannot be satisfied, lowering 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 $R''_F = \frac{\phi(R - I_F/q) + I_F/q - (1 - q)C'/q - \phi R}{1 - \phi}$. In either case, one can verify that A ’s expected gain from using funds from F , as opposed to O , is negative. \square

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, for example, think of them as having 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. $q \left[R(I) - \frac{I}{q} \right] < qB(I)$ 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*.²³

²³Note 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.

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 F s). We know that an entrepreneur’s expected utility gain, if reliant on family finance, from the project is $Z - \phi W = (1 + \phi)(qR(I) - I) - \phi\rho q(1 - q)R(I)^2$ (see the proof of Proposition 1). The derivative with respect to I is

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

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 3).

Figure 3

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 .²⁴

Finally, as in Section II, 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 take on the project 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. The social frictions in this model increase with project size: The favor expected after a default increases with the amount invested by F . Not only does this impose greater costs on A if he pays F the favor but it also renders A more prone to deny F the favor, thus making the relationship more vulnerable.

Figure 4

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 can be rewritten as

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

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

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

²⁴In our model, we cannot vary the variance of the project cash flow independent of its mean. It is intuitive, though, that the upper bound on project size would increase in that variance, which would imply that A is less willing to fund a project of given size through F if, all else equal, the cash flow risk is larger.

For $I \rightarrow W$, the left-hand side of this inequality goes to 0, while the right-hand side converges to something positive (unless $R_F < 0$, in which case F would *grant* A the outlay). Hence, 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 4).

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 lower the amount of money that A must raise from O , possibly so much that A 's incentive compatibility constraint holds. If so, A can fund projects larger than \bar{I}'_F but smaller than \underline{I}_O without having to compensate O for monitoring costs.

6 Risk choice

So far, we have assumed that project risk is determined as the project is financed. In this section, we show that one of our central predictions, namely that family finance discourages risk taking, also holds under ex post risk choice. Moreover, we show that this distinguishes our theory further from others that would predict less-than-first-best risk taking under informal finance when the risk is chosen ex ante but not when it is chosen ex post.

We abstract from private benefit consumption and instead consider a choice between two projects requiring the same outlay I but differing in risk. For simplicity, suppose one project is safe and yields cash flow $\bar{R} > I$. The risky project yields R with probability $q < 1$ and 0 otherwise. Furthermore, assume that A faces an efficient risk-return frontier:

$$qR > \bar{R}. \tag{19}$$

Thus, the first-best choice is to fund the risky project through a risk-neutral formal investor.

The key question is whether informal finance induces A to take the safe project.

6.1 Social risk aversion vs. investor risk aversion

We begin with the first scenario, social risk aversion, comparing it to a model in which (only) the *family investor*, F , is risk averse and there is no altruism. Clearly, the alternative model also yields the prediction that family finance leads to less risky projects than formal finance if project risks are determined ex ante. Suppose, however, that A chooses the project after the terms of financing have been set.

Let R_F denote the repayment promised to F . Under social risk aversion, A prefers the risky project if and only if

$$q(R - R_F) + \phi(W - I + qR_F) - \rho q(1 - q)[R - (1 - \phi)R_F]^2 \geq \bar{R} - R_F + \phi(W - I + R_F) \quad (20)$$

which can be rewritten as

$$qR + \underbrace{(1 - q)(1 - \phi)R_F}_{\Psi} - \underbrace{\rho q(1 - q)[R - (1 - \phi)R_F]^2}_{\Sigma} \geq \bar{R}. \quad (21)$$

Here, Ψ captures (classic) risk shifting incentives, whereas Σ captures social risk aversion. By contrast, if only the family investor is risk averse and altruism is absent, the analogous condition is $q(R - R_F) \geq \bar{R} - R_F$, or

$$qR + \underbrace{(1 - q)R_F}_{\Psi'} \geq \bar{R} \quad (22)$$

A is less inclined to take the risky project in the first case for two reasons: First, altruism reduces risk shifting incentives ($\Psi/\Psi' = 1 - \phi < 1$). Second, he exhibits social risk aversion Σ , which is absent in the model without altruism. Moreover, note that in the first case, as $\phi \rightarrow 1$, risk shifting incentives vanish ($\Psi \rightarrow 0$) whereas social risk aversion grows ($\Sigma \rightarrow \rho q(1 - q)R^2$), so that (21) becomes tighter than (19); in contrast, (22) is always more lax than (19).

Hence, for given R_F , social risk aversion leads to less (ex post) risk taking than investor risk aversion, and for sufficiently strong altruism, it even leads to less risk taking than under first best. By contrast, investor risk aversion would induce, if anything, excessive risk taking.

Endogenizing R_F reinforces these conclusions because, being risk averse and non-altruistic, F would require a higher repayment in the alternative model, which strengthens risk shifting incentives. (In fact, in that model, A is less inclined to take risks under *formal* finance.)

6.2 Social debt vs. social sanctions

Next we compare the second scenario, social debt, with a model in which a default leads to social sanctions that impose a fixed cost K_A on the delinquent borrower. Being a bankruptcy cost, K_A induces a more conservative ex ante risk choice, but its effect on ex post risk choice is less clear.

Consider the second scenario and assume, to highlight differences to the alternative model, that a default induces A to pay F favors at cost C . For given R_F , A chooses the risky project if and only if

$$q(R - R_F + \phi R_F) + (1 - q)(\phi G - C) \geq \bar{R} - R_F + \phi R_F \quad (23)$$

which can be rewritten as

$$qR + \underbrace{(1 - q)(1 - \phi)R_F}_{\Psi} - \underbrace{(1 - q)(C - \phi G)}_{\Sigma} \geq \bar{R}. \quad (24)$$

While Ψ again captures risk shifting incentives, Σ now captures social frictions.

In the alternative model with exogenous social sanctions, A chooses the risky project if $q(R - R_F) - (1 - q)K_F \geq \bar{R} - R_F$, or

$$qR + \underbrace{(1 - q)R_F}_{\Psi'} - \underbrace{(1 - q)K_F}_{\Sigma'} \geq \bar{R}. \quad (25)$$

While the risk shifting incentives are lower in the first case ($\Psi' > \Psi$), the comparison of the social bankruptcy costs is ambiguous. Here, it is helpful to recall the parametric restrictions of the second scenario, **A2**, which imply $R_F \leq G < C$. Under this condition, (24) is always tighter than (19).²⁵ By contrast, (25) is tighter than (19) only if the social bankruptcy cost K_A exceeds the face value R_F , which is not true in the former case where there can be less

²⁵To see this, set $R_F = G$ in which case (24) becomes $qR + (1 - q)(R_F - C) \geq \bar{R}$. This maximizes the risk shifting incentives, Ψ , subject to the parametric restriction. Even so, due to $R_F < C$ —otherwise, the favors would be ex post efficient—this inequality is tighter (19).

risk taking than under first best even if the effective bankruptcy cost $C - \phi G$ is smaller than R_F . The underlying reason is that, in the model of costly favors, the risk shifting incentives never exceed the cost of social frictions: even if $R_F = G$, in which case the required favor matches the face value, the risk shifting incentives are insubstantial; F always gets repaid in full, that is, there is no limited liability.

Not only do altruism and social debt eclipse risk-shifting incentives in the case of costly favors, they also imply $R_F < I$ because the favors eliminate the default risk and F may be willing to supply funds below the break-even rate due to her altruism. This further tightens (24) relative to (25) because the exogenous bankruptcy costs, which might also afflict F , and the lack of altruism in the alternative model imply $R_F \geq I$. Thus, in facing an efficient risk-return frontier, A exhibits excessive conservatism in the model with costly favors and, in comparison, tends towards excessive risk taking in the model with exogenous social sanctions.

7 Discussion

7.1 Empirical implications

In this section, we discuss empirical predictions, and possible tests, that can help distinguish our theory from other theories of informal finance. The first prediction other theories based on information, cost, or wealth differences cannot match is rather trivial: the negative price. Broad-brush evidence on interest-free family loans exists. Also, in many countries, we expect formal family loans to bunch at the minimum interest rate that exempts them from gift and other taxes. That said, while inconsistent with the other theories, negative prices per se do not require a new theory of informal finance.

A more challenging task is to show systematically that, despite these low prices, borrowers actually prefer to raise formal finance. One question that could be empirically addressed and would shed light on this hypothesis is to what extent entrepreneurs starting out with family finance later, once they are able to, take high-interest formal loans to *settle*, rather than add to, low-interest family loans. A more rigorous test would be to identify some exogenous shock to the availability of formal finance and to examine how it affects the use of family finance. For example, in 2010, the Swedish government passed a law that limits new mortgages to a maximum of 85 percent of the home's market value. A study by the Association of Swedish

Real Estate Agents shows that homebuyers finance the remaining 15 percent mostly through loans from their families (*The Local*, 2011). An increased use of family loans at *below-market* interest rates following the law—data that could be collected—would imply that homebuyers did not exhaust this cheap source of finance in the absence of the law.

As stressed in Section 6, another key prediction of our theory is that social ties between borrowers and lenders inhibit risk taking, both *ex ante* and *ex post*. Andersson et al. (2012) show experimentally that variation in social preferences affects the proclivity to take risk on behalf of others. One could use a similar approach in field studies. Consider, for instance, a hypothetical microfinance field experiment in which prospective borrowers are given (i) an individual-liability loan offer and (ii) some of them, randomly chosen, a second, cheaper offer if they have an eligible co-signer; moreover, (iii) *after* the loans are approved, a random subset of the co-signers is relieved of their responsibility just when the loans are disbursed. Comparing use of funds—especially the riskiness of the uses the loans are put to—across treatments (i), (ii), and (iii) would shed light on the impact of social ties in financing on risk choices.²⁶ Finally, in order to distinguish between social risk aversion and social frictions, one could design an experiment in which full repayment by some borrower is a prerequisite for loan approval to another borrower, and compare treatments where (iv) this is common knowledge, (v) the first borrower knows that the second borrower is unaware of the conditionality, and (vi) no such conditionality is imposed.

7.2 Social intermediation

According to our theory, institutions that want to harness social relations for financial transactions should be concerned about (how to reduce) social risk aversion and social frictions. Arrangements that foster social incentives but limit direct exposure to close acquaintances would encourage take-up and, if so desired, risk taking. This is not a novel idea.

Consider, for example, *gemachs*, which are free-loan funds found in Jewish communities. Also referred to as Jewish or Hebrew Free Loan Societies, they collect money from “donors” in the community and dispense interest-free loans to “borrowers” from the same community. This creates social incentives because the borrowers know that repaying their loans benefits someone else in the community. Importantly, *gemachs*, often run by families or rabbis, usu-

²⁶See Karlan et al. (2009) for an actual field experiment on which this idea is based.

ally operate on the basis of anonymity: borrowers and donors know little of each other, apart from being members of the same community. This reduces social frictions, including feelings of shame or indignation, a benefit that direct lending relations do not offer. Nevertheless, gemachs are a recourse rather than regular financing source. In the wake of the late financial crisis, gemachs have experienced a revival in Jewish communities across the United States (Waldman, 2009; Freedman, 2011).

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

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

[W]e 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.²⁷

Crowdfunding intermediaries, such as ArtistShare, Kickstarter, and RocketHub, also combine social incentives and formal intermediation. Agrawal et al. (2012) empirically study financing patterns on the crowdfunding platform Sellaband through which musicians can raise funds to produce new albums. They find that early contributions to a musician often come from family and friends. Given that crowdfunding intermediaries are remunerated in proportion to

²⁷From http://www.virginmoneyus.com/Virgin_Money_Social_Loans, accessed on March 25, 2010.

the total amount raised, this raises the question why this family finance is provided “online” rather than “offline.” One possible explanation is that the platform, by formalizing the terms and introducing third-party enforcement, allows friends and relatives to finance the artist at lesser social frictions. For example, the authors speculate (6),

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

7.3 Micro venture capital

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

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

One way the poor deal with the risks they (already) face and the anxiety is to be conservative; that is, they take few risks.²⁸ 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 should primarily serve 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.

²⁸Banerjee and Duflo (2010) emphasize this point and provide an example of how such conservatism can deter the adoption of productivity-enhancing technology.

Similar observations have been made about microfinance. Recent evidence suggests that microloans designated as commercial loans are commonly used for safe business purposes, such as working capital rather than capital expenditure, or even non-business purposes, such as consumption smoothing (Collins et al. (2011): 47), and less (than expected) for risk taking and growth. According to Banerjee and Duflo (2010: Chapter 6), part of the explanation is that microlending is designed to minimize default, that is, it makes “zero default” imperative. Consider, for example, joint-liability group lending, the idea behind which is that the social pressure will induce the members to repay each loan. But, along with 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.

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

The idea of social intermediation discussed in the previous section could also be applied in this context. The guiding principle would be to both use social relations for incentives and to protect them by limiting downside risks and social frictions through formal intermediation. The following is a speculative proposal for a micro venture capital fund based on features of village banks and community loan funds:

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. All contracts, funds, and transfers

are administered by the NGO, not by the villagers. The first screening uses the NGO’s expertise. The village vote and its fund harness the social relations for information and incentives, respectively. Anonymity of the vote, formal funding, and NGO administration protect the social relations. Moreover, the villagers do not risk their existing wealth, and there is some diversification across the village fund’s investments. The “rents” that accrue to the villagers are compensation for providing information and incentives.

7.4 Legal liability vs. social indebtedness

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. Formal enforcement allows people to transact outside of their social sphere. This provides access to more potential counterparties, but it also has simple social benefits, which are plainly expressed 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. . . . “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.²⁹

Our analysis pinpoints two such benefits: reducing social risk and avoiding social frictions. While it is easy to see better risk sharing—channeling risk away from one’s “loved ones”—as a benefit of formality, arguing that formal finance has evolved to avoid “indebtedness” rings less obvious. Yet the evolution of formal finance much reflects this rationale. Historically, the norm for all loans—including formal ones—used to be personal liability.³⁰ But already in ancient times, there was an awareness that unlimited liability could be harmful. Deuteronomy 15:1-2 says,

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

²⁹From <http://www.businessweek.com/smallbiz/news/columns/98-25/e3583056.htm>, accessed on March 26, 2012.

³⁰Such personal liability could mean slavery for delinquent debtors and sometimes their entire households, imprisonment, or even the death penalty (Levinthal (1918)).

neighbor, or of his brother, because it is the Lord's release.³¹

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

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

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

This *tabula rasa* approach to bankruptcy, lost in the Middle Ages, 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 treatise 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:

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

³¹Asking why any lending occurred in the shadow of such future leniency, Atwood (2008: 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." In other words, Atwood hypothesizes that, *socially*, the obligations persisted beyond the legal forgiveness.

At the same time, many scholars have pointed out that limited liability was an institutional response to the need for risk taking and growth, and thus instrumental, during the Industrial Revolution (see, for example, Landes, 1999: Chapter 17).

In summary, the modern legal approach to bankruptcy marks an evolution from personal bondage to limited liability. We argue that this is a key innovation that distinguishes formal finance from family finance. Formal liability is specified by contracts and enforced by courts. With family finance, emotions, norms, and social pressure define the degree of indebtedness.³² 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 finance allows for *contractual* designs of liability that are more flexible than *social* obligations. This argument presumes that social obligations, unlike contractual liabilities, cannot credibly be finetuned ex ante—if this were possible, social obligations would dominate formal contracts in our model. One justification for this assumption is that social frictions arise from norm violations that elicit emotional responses, such as disappointment, anger, or indignation, that are hard—perhaps impossible—to suppress. But this rigidity, seemingly a disadvantage, may have purpose. If emotional reactions were contractible, they would—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 emotional reactions (that underlie social frictions) is the *source* of commitment. This is consistent with a principal evolutionary theory of emotion, according to which some emotions have evolved as commitment devices (see Haselton and Ketelaar (2006) and the references therein).

8 Robustness

In this section, we discuss that our results do not rely on the specific ways in which we have modeled altruism or social obligations, nor on the assumed risk preferences.

³²The 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*.

8.1 Social risk aversion: risk preferences and modeling altruism

The principal assumptions we make to obtain social risk aversion are A 's risk aversion and the altruism between A and F . However, the particular formalization chosen in Section 3 is not crucial, though it is very tractable and cleanly isolates the forces that create social risk aversion. This section briefly considers, in turn, alternative ways of modeling the altruistic relation and alternative assumptions regarding the risk preferences. More specifically, we will consider assuming that A and F internalize each other's either *realized* or *expected utilities*, and assuming that either everyone or everyone except A is risk averse. (We deliberately keep O and F identical in terms of risk aversion.)

Table 2

Table 2 illustrates the four resulting cases, all of which manifest social risk aversion. In case (a), although A is risk neutral, his utility function exhibits social risk aversion because it inherits the concavity of F 's utility function through the altruism. In case (b), this effect is compounded by the concavity in A 's own utility function, that is, his own risk aversion. In either case, A does not care about risk borne by O whose utility he does not internalize. In case (c), A internalizes the risk discount in the expected utility of F when she swaps a safe amount for a risky claim, but he does not do so in the case of O . This effect is independent of whether A himself is risk averse, and therefore also present in case (d). Also, F exhibits social risk aversion in all four cases: being risk averse, F dislikes the idea of A bearing risk, and thus prefers O to assume the risk. Irrespective of which way it runs, social risk aversion increases the appeal of formal finance.

In general, altruism conjures social risk aversion whenever at least one of the connected parties is risk averse. Intuitively, altruism turns them into partial alter egos, and it suffices if one of the egos is risk averse for them to strictly prefer transferring risk to a third party. In other words, the only case in which altruism, whether modeled through realized or expected utility, does not conjure some form of social risk aversion is when both connected parties are risk neutral.

Finally, note that our formulation implies *paternalistic* preferences on the part of A : he dislikes F bearing risk more than F herself is concerned about the risk.³³ This paternalistic

³³Paternalistic preferences are not unreasonable in the context of family ties; after all, the term paternalism itself originates from this context. Loginova and Persson (2012) study a setting in which altruistic preferences

effect arises whenever a risk averse party, here A , internalizes another party's *realized* utility or payoff. It is therefore also present (though not necessarily dominant) in cases (a) and (b), where there is at least one risk averse party internalizing someone else's realized utility.

8.2 Social debt: modeling social frictions

The key assumption of the social debt model is that the altruism between A and F decreases if A refuses to compensate F for a default 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. We could also 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 threat 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 costless monitoring technology, with no downside, which eliminates any social frictions on the equilibrium path.

Our model assumes social frictions only on the downside. However, family finance could also lead to social obligations on the upside. Ex post, family investors may tacitly demand more generous compensation in the case of extraordinary success, a demand that, if not met, might cool their feelings for the entrepreneur. Not only would this increase the scope for ex post social frictions but it would even dampen entrepreneurial effort, thereby increasing the entrepreneur's preference for formal finance.

Last, 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 main points.

Again, our conclusions seem robust to alternative specifications. As discussed in Section 7.4, the crucial assumptions are that family finance creates potential social obligations and can lead to paternalistic policies intended to protect individuals (against their own will) from self-harm, such as seat belt laws.

that the ex post fragility of social relations, should these obligations not be met, cannot be finetuned ex ante.

8.3 Heterogenous altruism

Our analysis assumes that the altruism between F and A is equally strong in both directions. Instead, we could distinguish between ϕ_F , F 's altruism for A , and ϕ_A , A 's altruism for F , which would affect the trade-off involving family finance that is at the heart of our results. In the scenario with social risk aversion, ϕ_F would determine to what extent F is willing to finance A at a negative price, which would indirectly affect A 's incentives and participation constraint. In contrast, ϕ_A would have a direct effect on A 's incentives and, crucially, govern the magnitude of his social risk aversion. Thus, while both components distinctly influence the trade-off, ϕ_A plays a more central role. The same is true in the scenario with social debt. Again, on one hand, ϕ_F would allow for negative prices, and indirectly affect A 's incentives and participation via the price. On the other hand, ϕ_A would directly improve A 's incentives, in part by making A susceptible to social frictions: if A did not care about F , he would not be afraid of harming their relationship.

8.4 Building relations

In our framework, financial transactions can only reduce but not increase altruism. In some sense, we consider parties that have a well-developed relationship. However, one can imagine situations in which the act of lending improves the relationship between F and A , that is, increase the altruism between them, even while assuming that a default might still harm it. If so, family finance would gain in appeal because it would further increase the non-pecuniary utility enjoyed by F and A . However, it would also strengthen A 's social risk aversion in the first scenario, and it would render a loss of friendship costlier in the second scenario. Both of these effects would increase A 's disinclination to take risks: intuitively, he would feel worse about a bad outcome because of his increased sympathy (gratitude) for F 's generosity, or he would become more reluctant to endanger the relationship given that it has become more valuable as a result of the transaction.

8.5 Safer investments

The assumption that F 's alternative use for her funds is safer than A 's project is important. If, conversely, investing in A were not only more lucrative but also *safer* than any other option at F 's disposal, A and F would both prefer family finance over formal finance. Intuitively, A would not only get his project financed but also enjoy providing F with a *savings technology* that reduces the risk F is exposed to. Thus, while such a change of assumption reverses the pecking order between family finance and formal finance, this reversal ultimately reinforces, rather than weakens, our central conclusion: family finance is a poor source of *risk* capital, not of capital in general.

8.6 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.

9 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 costs, endowments, or access to information. 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 rather interesting. Family finance breeds trust, but it also has social ramifications that discourage taking large

risks. Conversely, by circumventing such ramifications, formal finance encourages risk taking. Combining the strengths of both sources can thus be optimal by harnessing social relations for incentives and weaving in formality to mitigate the social repercussions of financial transactions. Our findings suggest that family finance is suitable at early stages of a startup but an *inherently* constrained source of finance when it comes to large investments and growth in risky ventures.

Rather than claiming that ours is a comprehensive, or the only accurate, theory of family finance, the purpose of this paper is to argue that it is important to take account of altruism in order to understand these financial transactions. Our theory shows that altruism not only leads to distinct empirical predictions but also practical implications for the provision of risk capital in the presence of social incentives. We believe that it is worthwhile to devise direct empirical tests of our key predictions, namely that (i) some borrowers prefer a formal loan over a family loan at a lower interest rate (ii) family finance discourages risk taking, *ex ante* and *ex post*, (iii) this happens because of aversion to both social risk and social frictions, (iv) defaults harm the quality of social relations, and (v) formal contracts, outside contributions, and intermediation alleviate these effects. It would also be interesting to study the impact of social intermediation, discussed in Sections 7.2 and 7.3, comparing various designs. This could yield insights that help improve the provision of micro venture capital.

On the theoretical side, we have clearly left several issues unaddressed. Two strike us as particularly 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 optimal security design, though beyond the scope of this paper, is affected by the trade-offs discussed. For example, in the social risk scenario, 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, to a stronger assurance effect.

Second, we have yet to analyze the endogenous formation of social relationships. Again, consider the social risk scenario. Having numerous altruistic relationships would allow the entrepreneur to spread out the the risk, and thereby to “diversify” the social risk. 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 for financial transactions. Such effects of improved formal institutions on the value of social ties may be more general and possibly related to socioeconomic trends such as the secular decline in family size.

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Figures and tables

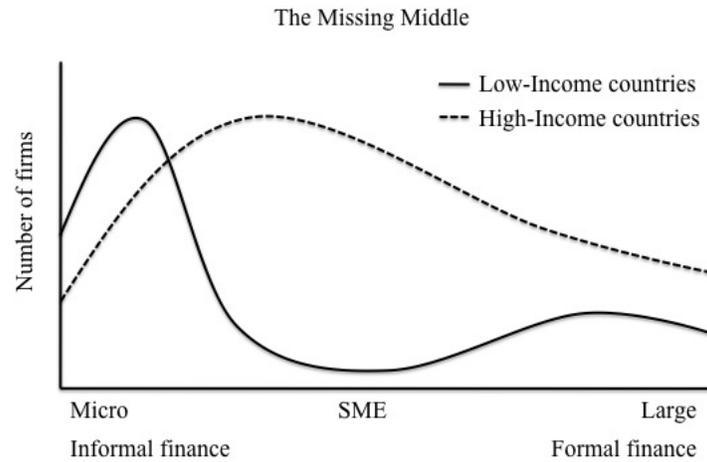


Figure 1: This is a stylized depiction of firm size distributions in high-income and low-income countries (adapted from the website of the Entrepreneurial Finance Research Initiative, Center for International Development, Harvard University). Firm size and dominant type of finance are on the horizontal axis, and the number of firms is on the vertical axis.

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

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

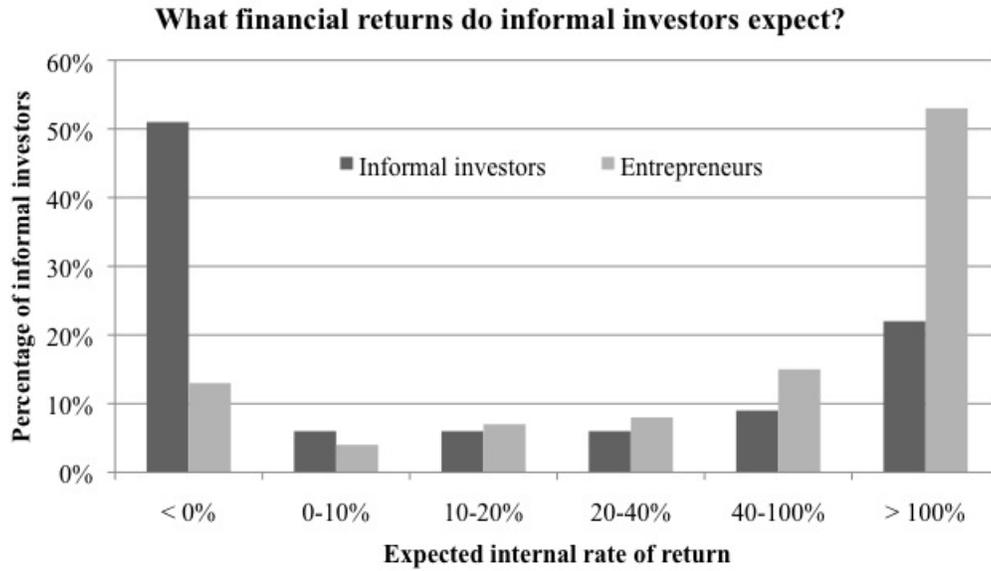


Figure 2: Based on the 2004 GEM survey, the dark bars illustrate the distribution of expected internal rates of return reported by the informal investors, whereas the light bars illustrate the distribution of expected internal rates of return reported by the entrepreneurs (Bygrave (2004)).

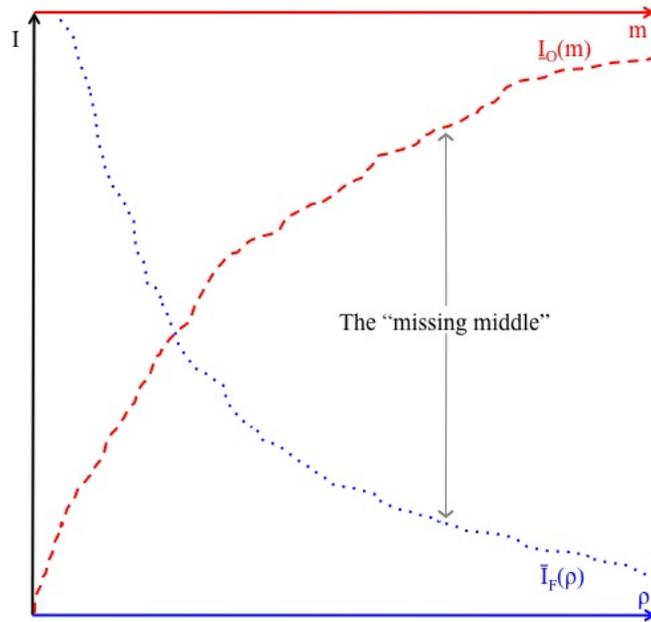


Figure 3: Project size (I) is depicted on the vertical axis, the entrepreneur's risk aversion (ρ) on the bottom horizontal axis, and the formal investor's monitoring cost (m) on the top horizontal axis. The dotted line depicts the maximum project size under family finance as a function of risk aversion, $\bar{I}_F(\rho)$. 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).

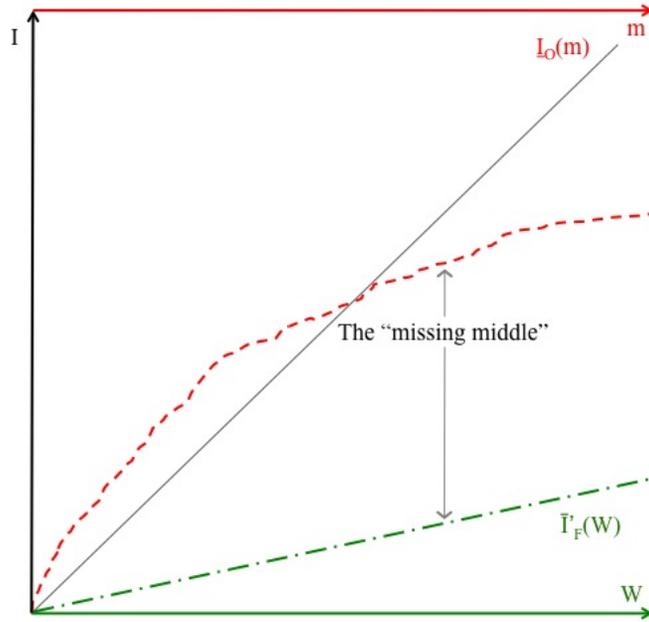


Figure 4: Project size (I) is depicted on the vertical axis, the family investor's wealth (W) on the bottom horizontal axis, and the formal investor's monitoring cost (m) on the top horizontal axis. The solid diagonal is the 45 degree line. The dashed-dotted line depicts the maximum project size under 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).

	Internalize realized utility	Internalize expected utility
Only O and F are risk averse	(a) Yes	(c) Yes
A , O , and F are risk averse	(b) Yes	(d) Yes

Table 2: Is there social risk aversion under alternative assumptions?