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COORDINATION FRICTIONS IN VENTURE CAPITAL SYNDICATES

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ABSTRACT

An extensive literature on venture capital has studied asymmetric information and agency problems between investors and entrepreneurs, examining how separating entrepreneurs from the investor can create frictions that might inhibit the funding of good projects. It has largely abstracted away from the fact that a startup typically does not have just one investor, but several VCs that come together in a syndicate to finance a venture. In this chapter, we therefore argue for an expansion of the standard perspective to also include frictions within VC syndicates. Put differently, what are the frictions that arise from the fact that there is not just one investor for each venture, but several investors with different incentives, objectives and cash flow rights, who nevertheless need to collaborate to help make the venture a success? We outline the ways in which these coordination frictions manifest themselves, describe the underlying drivers and document several contractual solutions used by VCs to mitigate their effects. We believe that this broader perspective provides several promising avenues for future research.

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1. Introduction

Venture Capital is a critical source of finance for the most innovative firms across the world and has been associated with the commercialization of several radical technologies, from semi-conductors and biotech through to the current wave of technological revolutions in financial services, robotics, virtual reality and space exploration. While less than 1% of firms that are formed in the United States receive venture capital finance (Puri and Zarutskie, 2012), VC-backed firms comprise nearly half of U.S IPOs each year, showing the disproportionate impact that such firms have on job creation and productivity growth in the economy (Kerr, Nanda and Rhodes-Kropf, 2014).

Academic research on venture capital has extensively studied asymmetric information and agency problems between venture capital investors and entrepreneurs, essentially asking the question: how does separating the entrepreneur and investor create frictions that might inhibit the funding of good projects (Gompers and Lerner, 2004)? Relatedly, the literature has looked at contractual provisions in venture capital that try to overcome these frictions (Gompers, 1995; Kaplan and Stromberg 2003, 2004; Hellmann 1998; Cornelli and Yosha, 2003) and the role that monitoring and governance by venture capital investors plays in improving the performance of the ventures they back (Lerner, 1995; Kortum and Lerner, 2000; Hellmann and Puri 2000, 2002; Chemmanur, Krishnan and Nandy, 2011; Bernstein, Giroud and Townsend, 2016).¹

While this research has contributed greatly to our understanding of the dynamics between VCs and entrepreneurs, it has abstracted away from the fact that a startup typically does not have just one investor, but several VCs that come together in a syndicate to finance a venture. When syndication has been studied, it has largely examined the *benefits* of syndication in terms of entrepreneurial performance (Tian, 2012) and VC performance – for example the importance of reciprocity in getting access to superior deal flow (Lerner, 1994), the ability to diversify investments across distant geographies (Sorenson and Stuart, 2001), or the ability to share information that helps with selection and governance of portfolio companies (Hochberg, Ljungqvist and Lu, 2007).

There has been little focus, however, on the potential *costs* of syndication and the implications these can have on VCs and the startups in which they invest. We believe that this is an important and under-studied element of the literature for several reasons. First, syndication is the norm in venture capital investing, not the exception. Table 1, based on data drawn from Thompson Reuter's Venture Economics database, provides some basic facts about syndication patterns among VCs investing over the past 15 years. As can be seen from Table 1, the average startup that received funding over this period had 3 investors; at least half the startups had two or more investors and a quarter of all startups had 4 or more investors. Conditional on making it to the

¹ See Da Rin, Hellmann and Puri (2012) for a review of the literature on venture capital.

third round of financing, however, the average startup had nearly 4 VCs providing funding. Furthermore, the number of investors continued to grow among startups that raised additional rounds of funding. Since syndication is such a common feature of venture capital, studying the frictions that might arise within VC syndicates is critical to an understanding of the relationship between investors and entrepreneurs.

Secondly, there has been a proliferation of funding sources for startups over the past decade, driven in part by the falling cost of starting new firms (Ewens, Nanda and Rhodes-Kropf, 2017) and in part by hedge funds and public investors participating in late stage financings of ventures prior to their going public (Chernenko, Lerner and Zeng, 2017). New types of financial intermediaries from seed or micro VCs, super angels and crowdfunding platforms to venture debt, mutual funds, hedge funds and sovereign wealth funds have emerged in the capital supply chain, each with a different set of objectives and incentives. It is worth noting that these differences in investors' incentives manifest themselves across the entire lifecycle of a startup and can impact the pivotal moments in any venture, from decisions around whether to continue financing a startup and whether to replace a CEO, to strategic issues such as a focus on growth vs. profitability to preferences around the timing and nature of a liquidity event. Since the proliferation of new funding models has made the set of investors more heterogeneous, the divergence of incentives across different investor types has increasingly important implications for the way entrepreneurs (and VCs) build their syndicates. As Bartlett (2006; 2015) documents, and has been seen in recent high profile cases such as Uber, the differences in incentives between different classes of investors are real and consequential for both investors and entrepreneurs.

Finally, from a theoretical perspective, a better understanding of the frictions associated with syndication will help provide deeper insights into the tradeoffs faced by venture capital investors in terms of the best syndicate partner in a given deal. For example, prior research has reached divergent conclusions on the composition of syndicates, with some work finding evidence of homophily or assortative matching between investors and others not (see Du (2016) and Da Rin, Hellmann and Puri (2012) for a more detailed discussion). Understanding the nature of coordination frictions can help to shed light on the how the composition of syndicates are likely to vary across regions or points in time – and hence how these will impact the outcomes of the startups they back.

In this chapter, we argue for an expansion of the perspective on frictions between investors and entrepreneurs to include coordination frictions *within* VC syndicates. That is, what are the frictions that arise from the fact that there is not just one investor for each venture, but several investors with different incentives and objectives, who nevertheless need to collaborate to help make the venture a success? Moreover, what actions might VCs take to mitigate these frictions? With whom should they collaborate? What contractual provisions should be included in the terms of the financing? Finally, what implications do these coordination frictions have for entrepreneurs who are looking to raise venture capital? While our chapter is descriptive and draws substantially on our experience interacting with VC investors and entrepreneurs, we

believe that documenting and studying the effects of such frictions in a more systematic manner is a promising area of future study that can significantly enhance our understanding of venture capital-backed entrepreneurship.

In Section 2 of this chapter, we document some of the key drivers of coordination frictions and discuss how they manifest themselves in the syndication process and the outcomes of startups. In Section 3, we outline a number of strategies and contractual provisions that seem designed to mitigate the effects of such frictions. Section 4 concludes with some thoughts on the implications for entrepreneurs and our view on promising areas of future research.

2. Causes and Consequences of Frictions within VC Syndicates

2.1 Asymmetric Information: Insiders vs. Outsiders

The most common way in which VC syndicates grow is through the addition of investors at a new round of funding (e.g., see Table 1). This is because VC funds rarely have the ability or desire to unilaterally finance a startup until it reaches cash flow positive. Initial investors therefore rely on the additional investment and expertise from new members of the syndicate as the startup grows and requires further capital.

This process of growing the syndicate is rife with concerns about asymmetric information, however. VCs that are already investors in the startup are ‘insiders’. They have access to information rights, the ability to see first-hand the progress of the startup and can develop a sense of how good the team will be at executing the next stage of the firm’s growth. While some hard information, such as audited financials, can be shown to the new ‘outside’ investor, insiders nevertheless have privileged soft information that cannot be credibly communicated to others. The newest member of the syndicate is therefore concerned about adverse selection – that is, they may only get into, or get more of, companies where the insiders have negative information. On the other hand, insiders can use this to their advantage and extract rents from the entrepreneur. Admati and Pfleiderer (1994) is the canonical theoretical paper on syndication and provides both a theoretical foundation for bringing outside investors into the syndicate across rounds, and outline optimal contracts that balance the challenges associated with the asymmetric information on the one hand, and the ability of insiders to hold up the entrepreneur on the other.

However, if one or more of the insiders chooses not to participate in the next round of financing, this can be an important signal to the outsider that they may be investing in a lemon.² In an extreme, even if an insider chooses not to participate for reasons unrelated to the startup’s

² In addition to the adverse signal from not participating, note that the investor who does not participate in the next round of financing is purely a “seller” of equity, in that they only care about their dilution being minimized. Investors that are continuing to invest are both sellers and buyers – they want to minimize dilution but also want to buy in to the next round at an attractive price. Hence, the concerns about adverse selection become even further accentuated when an insider chooses not to participate.

success, it could lead a perfectly viable startup to go unfunded – and hence bankrupt – with important implications for both the entrepreneur and the other investors in the syndicate. This is not just an abstract concern. Novice entrepreneurs, for example, are often advised by veterans to be careful about taking money from certain corporate venture capital investors, since corporations have been known to re-prioritize their focus towards other opportunities on an ad hoc basis. When a corporate venture capital investor stops funding a startup, it is hard for other potential investors to determine if this was due to changing corporate priorities or whether the investor had information that caused them not to want to invest. The entrepreneur and the rest of the syndicate are then exposed to the adverse signaling consequences of their actions, even if things continue to progress well at the startup. Hellmann (2002) discusses other tradeoffs associated with taking funding from strategic vs. financial investors.

While some of the reasons that an investor may choose not to follow-on, such as a change in corporate priorities noted above, are idiosyncratic, there do seem to be systematic differences across VC investors in their approach to follow-on financing and we turn to discuss these in the next sections.

2.2 Systematic Differences in the “Experimentation Strategy” of VC funds

One of the distinguishing features of venture capital as an asset class is the degree to which its returns are skewed: VCs typically write off over half of their investments, and generate a substantial portion of their return from just a few, highly successful ventures (Kerr, Nanda and Rhodes-Kropf, 2014). Moreover, the early stage at which VCs often invest and the uncertainty facing startups means it is often hard to know, ex ante, which ventures will drive the few successes and which will fail.

This combination of skewed returns and the difficulty of picking winners ex ante means that VCs want to diversify their portfolio of investments so as to increase the odds of having a huge success. However, they also need to own a large enough equity stake in startups that ultimately succeed -- in order to generate sufficient return for the fund – given that half of their investments are written off entirely. VCs therefore face a critical tradeoff in allocating their capital, between achieving diversification and increasing ownership.

Some VCs aim to mitigate this tradeoff through staged financing – giving a small amount of funding to startups at their early stages, learning about the potential for success and either exercising their abandonment option if intermediate information is negative, or exercising the option to take their pro-rata share in the next round of investment if intermediate information is positive (Gompers, 1995; Bergemann and Hege, 2005, 2008; Tian, 2011). Each stage of financing can therefore be viewed as an experiment that generates information about the viability of the investment. Staged investment allows investors to update their priors based on the experiment’s results and to act accordingly. To the extent that these intermediate experiments are informative, it allows them to deploy a larger share of capital to startups that are ultimately

successful, despite not being able to identify the winners ex ante. Staged financing is therefore one of the key tools in the VC toolkit.

Of course in reality, the information generated by these ‘experiments’ is not clear cut. Some subset of results may be positive, others may be negative, requiring the investor to make judgement calls about whether or not to continue financing a venture. Moreover, individual partners looking at the same information can come to different conclusions about whether to extend another round of financing based on their judgement and their incentives. For example, suppose a startup has been growing its customer base 20% month-over-month for the past year, but customer churn rates are much higher than typical in the industry. Is the extremely high churn rate an indication about the inherent un-attractiveness of the product or a low quality user experience due to poor execution by the management team? Should the firm get another round of financing and if so, should the same management team be kept in place? It can be seen from this example that different individual investors could come to quite different conclusions based on their own prior experiences, and furthermore, might also fall back, as a matter of policy or *strategy*, to give the firm another chance versus choosing to exercise their abandonment option (Nanda and Rhodes-Kropf, 2017).

In fact, it has been documented empirically that VCs vary quite considerably in the degree to which they exercise abandonment options, with more prestigious VCs often being *more* likely to do so (Guler 2007). Anecdotally, VCs tend to have reputations among entrepreneurs about the degree to which they are “entrepreneur friendly” versus being “quick to pull the trigger” and can often go to great lengths to preserve these reputations. As just one example, the venture capital firm *Founder’s Fund* notes on their website that “VCs boot roughly half of company founders from the CEO position within three years of investment. Founders Fund has never removed a single founder – we invest in teams we believe in, rather than in companies we’d like to run.” This famous VC positions itself and builds a reputation as being entrepreneur friendly, which means that their approach to dealing with negative information about the founder’s execution capabilities might be quite different from others. On the other hand, one entrepreneur who wrote a review of the venture capital firm Sequoia Capital on the website TheFunded.com noted that, “Sequoia doesn’t want to be your friend. They want to get rich. You can decide whether or not that’s what you want, but they will be that voice for sure.”³

We refer to these systematic differences in the strategies of VCs around continued financing or founder replacement under negative information as their “Experimentation Strategy”. VCs with very different strategies are much more likely to have conflicting views on whether or not to extend another round of financing to a company. As we noted above, the decision by one investor not to follow-on can have real consequences for the success of the venture – and hence impact both the entrepreneur and the returns to the VC that would have liked to continue

³ Source, the Funded.com <http://www.thefunded.com/funds/show/Sequoia+Capital>, “Sequoia the Devil you Know”

investing – because the adverse signaling effects of an insider choosing not to reinvest can be substantial.

2.3 *Divergent Incentives due to Fund Size Differences*

Another important factor driving follow-on investment in subsequent rounds has to do with the size of a VC fund. This is because smaller funds cannot allocate as much capital to a startup as larger funds can, but investors are also constrained by the minimum amount of capital entrepreneurs are looking for in each round of funding. For example, a \$30 M fund may only be able to allocate an average of \$2 M per startup, across 15 startups. They might ideally like to start by giving only a small portion of \$2 M in the initial round of funding – say \$200,000, with room to deploy more capital if intermediate information is positive. However, an entrepreneur looking to raise an initial round of funding may be looking for a minimum commitment of \$1 M, to prevent the hassle of having to manage too many investors. Therefore, in order to stay competitive and participate in the deal, the \$30 M fund may invest half of its allocation to the startup in the initial round of funding, compared to an ideal allocation of 10%. This means that all things being equal, smaller funds may be more exposed to negative intermediate information and potentially be more willing to work with the startup to see if it can ‘pivot’. A \$300 M might allocate approximately \$15 M across 20 investments because partner time becomes a binding constraint and moreover, beyond a point, the marginal value of diversification is small, but the marginal value of greater ownership in a winner is large. For this fund, a \$1 M investment is much less consequential and the fund may be more willing to let a firm fail if initial experiments don’t seem promising. An illustration of this difference is the case of *Punchtab*’s founder, who faced a choice of whether to include a large VC firm in the Seed round of financing or whether to stick with Angel investors and a small “Super Angel Fund”. His friend, who was a venture capital investor himself, advised him that: “I worry about having a [larger] VC in the seed round because if the VC loses interest, you’re toast. It could be for reasons unrelated to the company, but if I am a potential Series A or B investor, and the original investor doesn’t go forward, that would be a show stopper for me. [Large] VCs are more likely to put a bullet in a seed project if the first experiment goes poorly.” (Nanda, Kerr and Barley, 2011). Hellmann, Schure and Vo (2017) look more generally at the instances when angel investors can be seen as complements vs. substitutes to venture capital finance.

Some funds actually choose to be small and then commit to *never* participate in the follow on rounds simply to avoid this signaling issue. Founders Collective, for example, only raises \$75m in each fund even though they could raise a much larger fund. Moreover, Founders Collective only invests in the seed round and never participates in the Series A. Because of this, there is no

negative signal when they are not in the A round. If instead they choose to participate in only the best follow-on rounds they would signal that they thought the other companies were bad.⁴

The examples above not only show that different investors might react differently to similar situations due to structural differences such as the fund size, but also that this has profound consequences for the founder as well (e.g., Hellmann and Thiele, 2015). As seen in Table 2, fund size differences have increased substantially in the past two decades. Table 2 documents that in the years prior to the internet bubble, the vast majority of funds had under \$50 M of assets under management. However, there has been a substantial increase in the number of large funds in last two decades, including several funds over \$500 M. This increases the chances of funds with very different incentives coming together in a syndicate.

We turn next to discussing the interaction between fund size and the non-linear incentives in limited partner contracts and show how this exacerbates the potential frictions arising from funds with very different sizes investing together in a syndicate.

2.4 The Role of Non-Linear Incentives in Limited Partner Contracts

Venture Capital investors typically contribute 1% of the fund's capital themselves. 99% of the capital is contributed by investors in Venture Capital funds, also known as Limited Partners. VCs' compensation contract is remarkably homogeneous. It usually follows the "2 and 20" rule, implying that VCs get 2% of the fund's committed capital as fees each year and get to participate in 20% of the profits they generate after returning committed capital back to their Limited Partners (Gompers and Lerner, 1999).

This contract has the properties of a call option, since VCs participate in losses in only a small way (1%) but get to participate substantially in the upside if they generate profits (Carpenter (2000) and Ewens, Jones and Rhodes-Kropf (2014)). Because of this, investors that have lost money on many of their other deals may wish to "gamble for resurrection" and advocate for high volatility strategies (even one that is negative expected value but has a great deal of skew). Alternatively, an investor whose carry option is well in the money will not be so inclined. With multiple investors, there is the potential for investors to be at very different points on the option payoff curve and thus have very different goals.

This non-linear payoff structure can also have important interactions with fund size when it comes to what is comes to considerations around what strategy a firm should pursue, including how it should consider opportunities to exit. This is because at any given exit level for a startup, a smaller fund is more likely to be in the money of their call option compared to a larger fund. Take for example a comparison between the \$30 M and \$300 M fund outlined above. Suppose

⁴ Another way that early stage investors mitigate adverse signaling consequences is to use a passive, rule-based approach to following on. In other words, they lay out, up front, that they will only participate in follow-on rounds of financing where the startup receives at least \$X at a \$Y million valuation from another VC, prior to their indicating a willingness to invest in the venture.

that they own 40% of a startup that is offered the opportunity to exit via acquisition for \$80 M. The alternative would be to put more money into the firm and try a higher-risk approach that could potentially lead to a \$300 M valuation but could also lead the startup to fail entirely. Partners in the \$30 M fund are more likely to want an exit at \$80 M, since this exit would already pay back the limited partners their gross investment and begin to generate profits. For the \$300 M fund, the \$32 M generated from the sale would be just over 10% of the committed capital. Partners in this fund will be more likely to gamble on the “\$300 M or nothing bet”. This is both because, as noted above, they would like to deploy more capital into ventures that show promise of a good outcome and also because increasing the volatility of an out-of-the-money call option increases its value. It is quite typical, therefore, for funds of very different sizes to disagree substantially on whether a startup should pursue certain exit options or go for additional funding. Such disagreements, if they occur at the board level, can create substantial challenges for startups.

2.5 Differences in Investment Horizon and Fundraising Cycles across VCs

The non-linear incentives facing venture capital investors also interact with the investment horizon of VCs (Barrot, 2016) and with the VC’s plans for raising their next fund. This is because the capital raised from Limited Partners is typically structured to last for 10 years – in other words, the goal is for the VC to invest, nurture and harvest their investments in the portfolio of startups within a 10-year window from the initial fund-raise. When a deal is harvested, the money is returned to the Limited Partners. Thus, in order to continue to invest, venture capitalists must repeatedly raise new funds.

Barrot (2016) shows how an investor’s horizon – that is the time left on the 10 year fund – can impact the investments they choose to participate in, but also the way in which they seem to manage their investments. New investments made later in the fund life appear to be managed more conservatively, with an emphasis on harvest as opposed to growth. Barrot (2016) also shows that VCs whose funds have experienced success early in the life of the fund tend to target less innovative companies. Similarly, Ewens, Rhodes-Kropf and Strebulaev (2016) show that the opportunity cost of a VC’s capital changes after the investment period – that is after initial investments in startups have been made and the remaining capital in the fund has been earmarked for follow-on funding for those ventures. VCs can only put capital into existing portfolio companies after the investment period ends. Thus, the opportunity cost of investing changes from any alternative investment to only other investments already in the portfolio. Ewens, Rhodes-Kropf and Strebulaev (2016) show that VCs past the investment period are more likely to continue to fund poorly performing investments.

In addition to investment horizon, subsequent fundraising plans by VCs also have the potential for conflicting incentives across members of a syndicate. To see why, note that investors typically do not wait until the end of their 10-year fund to raise another. A subsequent fund is often raised

every 3-5 years, once the investment period in a given fund has passed (Gompers and Lerner, 1992).

Gompers (1996) documents evidence of “grandstanding”, where younger, less reputable VCs push to take companies public sooner than their more reputable counterparts – as a way to signal their quality to limited partners and help raise the next fund. Similarly, VCs may not be willing to mark-down poorly performing ventures, and may continue to back startups until the new fund has been raised. Therefore, funds with different investment horizons and different fund raising cycles can target very different growth strategies and exit options for the same startup – leading to frictions within a syndicate about the best course to follow.

2.6 The Impact of Market Cycles and Re-financing Risk

Venture capital is notorious for going through boom and bust market cycles (Gompers, Kovner, Lerner, and Scharfstein, 2008). These investment cycles have important implications for frictions within syndicates due to the presence of re-financing risk, also referred to by VCs as financing risk.

While staged financing gives investors the advantage of being able to learn about the results of initial experiments before provide further funding, it comes with a potential cost – it requires a startup to go back to the capital markets frequently, making the venture vulnerable to the state of the market cycle at each point it returns for further funding. This is particularly true for early stage ventures and those requiring large amounts of capital before they reach cash flow positive, as such ventures typically cannot be funded through to cash flow positive by any one VC alone, and hence will depend on VCs joining a syndicate at a future point in time (Nanda and Rhodes-Kropf, 2016).

Nanda and Rhodes-Kropf (2013) show that in boom times, when early stage investors forecast an abundant availability of capital for startups, VCs tend to form smaller syndicates. This is because the projected need for follow-on funding from ‘insiders’ alone is less. On the other hand, cold markets are associated with a greater need for insiders to provide follow-on funding. For example, this challenge was particularly acute during the 2008/2009 financial crisis, when all VCs were focused on preserving cash to back their own portfolio companies, with little funding available for investments in follow-on rounds of other startups – even if those startups had shown intermediate success.

In fact, in particularly cold markets, when even otherwise viable companies may struggle to survive, VCs have to prioritize among their portfolio companies, even if all the investments are NPV positive. In such instances, a syndicate can face acute problems if a given startup is higher priority for some investors and low priority for others – since an inability to raise sufficient funding can lead otherwise viable startups to go bankrupt.

2.7 Moral Hazard and Hold Up in Teams

Venture capital investors have been shown to play an important role in the monitoring and governance of their portfolio companies. There has been limited research, however, on the disagreements between investors in terms of how much effort to devote to a given startup, and the future direction of the venture. Two such examples that have been documented extensively in other contexts and are relevant for VC syndicates are the role of Moral Hazard in Teams (Holmstrom, 1982) and the potential for hold up by some syndicate members (Gibbons, 2005).

Moral Hazard in teams arises from the free-rider problem. Since VCs are constrained in terms of the time they can allocate towards governance, (all else being equal) each investor would like *other* investors in a syndicate to allocate their time towards monitoring and governance. However, an investor who expends costly effort to monitor the company shares the benefit of the resulting success with the other investors. Therefore, a group of investors has the incentive to under-invest in monitoring startups and moreover, the larger the number of investors in a syndicate, the worse this problem becomes.⁵

Having multiple investors can also lead to hold up problems. To see why, consider the example of a firm that has received an acquisition offer. While the investors know the offer is attractive, any individual investor can argue that the best course of action is to stay the course, implicitly signaling that they will need a larger share of the proceeds in order to be willing to exit their position. Since all contracts in this context can be re-negotiated at any time, such an investor may even be able to extract a payment from one or more of the other investors – particularly if one of the other investors is more desperate to exit the company, given their differing priorities and incentives as noted above. In both such instances, the entrepreneur is often the biggest loser, as there can be real consequences for the venture.

3. Strategies and contractual features to mitigate coordination frictions

Having described the myriad sources of frictions arising in venture capital syndicates, we turn next to describing some of the actions that appear to mitigate these and hence can be seen as responses by VCs to address such frictions.

3.1 Choice of Syndicate Partners and Relational Contracts

A number of the sources of friction outlined above, such as differences in fund size, differences in the experimentation strategy across VCs and differences in investment horizon can be mitigated through the choice of syndicate partners who share the same characteristics, and hence whose incentives are more likely to be aligned. This role of ‘homophily’ in choice of syndicate partners seems to be an important area of study, as prior research has reached somewhat different conclusions about the degree to which VC syndicates exhibit homophily. These results may arise due to studying syndication patterns across investors facing different sets

⁵ Simultaneously, different skills may be needed to support a firm, which pushes up the number of investors.

of trade-offs, since the benefits of syndication and the potential costs of syndication vary considerably based on the age, experience, reputation and structural properties of any VC fund.

In addition to actively choosing syndicate partners whose incentives are more aligned, VCs can mitigate the desire to ‘defect’ in the event of a potential conflict, by engaging in a repeated game with other investors. This is likely to be particularly valuable in un-anticipated and non-contractible situations, such as sudden changes in market conditions, or the desire to hold up a syndicate when a particular type of exit option arises for a venture. To see why, note that the premise of a ‘repeated game’ with the same set of investors is that the threat of retaliation – which will lead to a potential loss of all the benefits of syndication in the future – can sustain cooperative behavior among syndicate members, even if the incentives to renege in any given moment are high. Indeed, as noted by Zhelyazkov, P. and R. Gulati (2016), venture capital investors who repeatedly withdraw from syndicates face consequences in terms of their ability to join subsequent syndicates.

The heat map in Figure 1 shows syndication patterns for a small subset of well-known and very active venture capital investors. It can be seen from this Figure that the degree of syndication is not evenly spread out – rather, certain firms seem to syndicate with the same set of investors repeatedly. This is consistent with the notion of ‘relational contracts’ arising from repeated game interactions between these VCs, which can help mitigate the costs of frictions noted above (Baker, Gibbons and Murphy, 2002).

Of course, despite the ability to choose syndicate partners and presence of relational contracts, there are nevertheless a number of explicit contractual provisions used by VCs that are complementary – in that they aim to anticipate, and provide explicit incentives to counter-act the desire to defect in certain circumstances. We outline these in greater detail below.

3.2 Contractual terms to address asymmetric information and moral hazard

One of the common ways in which investors address the issue of asymmetric information arising from insiders relative to outsiders is to allow investors in later rounds to have seniority in the capital structure relative to other classes of stock.

To see why, note that VCs typically invest in companies in return for convertible preferred stock (Cornelli and Yosha, 2003; Hellmann, 2006). If the proceeds from an exit are more than a certain threshold, VCs will choose to convert their preferred stock to common stock, thereby participating in the upside generated by the investment. However if the return is below such a threshold, investors do not have to convert their preferred stock to common, instead choosing to exercise their liquidation preference – which typically amounts to the value of their investment plus accrued dividends (but could be more, if negotiated as such at the time of the investment). In situations where the proceeds are insufficient to cover the liquidation amount payable to *all* preferred stock holders, the most senior holders of preferred stock get paid out first and any remaining proceeds continue to be paid out by seniority until there is no further cash available

to shareholders.⁶ As noted in the introduction, such occurrences are common – with over half of all startups generating less value at liquidation than the total amount invested in the company. Seniority in the capital structure is therefore a potentially important source of protection for a new investor – since it reduces the odds of losing their investment entirely. It is worth emphasizing that not all deals are structured in such a way, and it could even be seen as surprising that those who invest first – at the earliest stages of investment when information asymmetry is highest – do not get liquidation preference. However, the fact that those investing in later rounds have seniority is consistent with the notion that asymmetric information concerns are real, and are addressed by insiders signaling their willingness to be junior to the new class of investors, and thereby mitigating concerns about asymmetric information.

The free rider problem in teams is often ameliorated through the so called ‘lead’ investor designation. The lead investor typically puts the most money into the venture, and often takes a leadership role among investors in the round by joining the board. The lead investor and other investors on the board are stated as such in the formal documentation and press releases. These investors therefore also have the most on the line, both financially and in terms of reputation – and hence tend to be the VCs putting in the greatest effort in terms of monitoring, value added advice and governance. To the extent that VCs engage in repeated relationships as outlined above, groups of VCs can invest in multiple companies, with each one taking a lead investor role in a different venture – thereby getting the benefits of syndication without incurring the costs in terms of underinvestment from free-riding.

3.3 Aligning Incentives for follow-on investment: “Pay-to-Play” clauses

As seen in Section 2, a number of structural and strategic factors can impact the willingness of an investor to continue funding a startup in a follow-on round of financing. Aside from differences in fund size, experimentation strategy, investor horizon and the timing of fundraising, there are also market cycles – that are unpredictable and often unrelated to the specific progress made by a given startup – that can play an important role in determining the willingness of VCs to reinvest into a venture. Differences across VCs in their willingness to reinvest can be a major source of friction among members of the syndicate, particularly given the adverse signaling consequences of such an action.

The Pay-to-Play clause in venture capital term sheets is meant to reduce such frictions, by making it costly to go against the crowd in the syndicate. The following clause, taken from the National Venture Capital Association’s sample term sheet, details the specifics of this clause in the context of a Series A investment in the startup⁷:

⁶ Note that in this case, the common stock holders will not receive any payout, as common stock is junior to all preferred stock in the capitalization table.

⁷ Available from the National Venture Capital’s Model Legal Documents webpage, under “Term Sheet” (see <http://nvca.org/resources/model-legal-documents/>)

[Unless the holders of X% of the Series A elect otherwise,] all Investors are required to purchase their pro rata share of the securities set aside by the Board for purchase by the Investors. All shares of Series A Preferred of any Investor failing to do so will automatically [lose anti-dilution rights] [lose right to participate in future rounds] [convert to Common Stock and lose the right to a Board seat if applicable].

As can be seen from the clause above, this term provides a variety of potential “punishments” to an investor that does not invest their pro-rata share in a venture when other investors are doing so. This can range from losing their right to participate in subsequent rounds of financing, to revoking their board seat and losing cash flow rights associated with their preferred stock. In extreme cases, the term includes a clause that automatically converts their preferred stock to common stock at a 5:1 or 10:1 price, in effect substantially devaluing their ownership in the company. For example, with a 10:1 conversion price, a VC with 2 million shares of preferred stock would have their shares automatically convert to 200,000 shares of common stock, thereby stripping them of their preferred stock cash flow and control rights, but also devaluing their ownership to 1/10th of what they originally owned.

The play-to-play clause is less valuable at times when financing risk is low, but becomes increasingly important at times when financing risk is high – which is when syndicate members need to count on others to continue financing ventures in the event that capital from outsiders is in short supply. While invoking such a clause can harm relationships in a repeated game context, the threat of extreme punishment can ensure that all investors continue to ‘cooperate’ in equilibrium. That is, the enforcement of such a contract is likely to be rarely seen in practice, as investors tend to ‘chase’ to participate in the follow on round given the presence of a pay-to-play clause.

3.4 Preventing hold-up at Exit: Drag Along Rights

VC contracts also typically have provisions that can be put in place to limit hold-up and reduce the power of a dissenting voice. For example, major decisions can often be made with less than a majority of the investors in a given round or in the company. The most prominent such term is one that stipulates the “Drag-along-rights” of investors in a syndicate. Drag along rights allow a majority of investors in a syndicate to force the remaining investor(s) to vote in favor of a liquidation event in the event that such an investor is holding up the transaction due to their conflicting interests in the transaction.

Again, the following paragraph, taken from the National Venture Capital Association’s sample term sheet, details the specifics of this clause in the context of a Series A investment:

Holders of Preferred Stock and the Founders [and all future holders of greater than [X]% of Common Stock (assuming conversion of Preferred Stock and whether then held or subject to the exercise of options)] shall be required to enter into an agreement with the Investors that provides that such stockholders will vote their shares in favor of a Deemed Liquidation Event or transaction

in which 50% or more of the voting power of the Company is transferred and which is approved by [the Board of Directors] [and the holders of ____% of the outstanding shares of Preferred Stock, on an as-converted basis (the “Electing Holders”)].⁸

It can be seen that this clause contractually prevents hold-up at exit, because it forces any investor who is holding out in such an event to also vote in favor of the exit, and therefore ensure that the transaction can go through.

4 Real Effects and Implications for Entrepreneurs

In this chapter, we have outlined a number of factors that can lead to divergent incentives among VCs backing the same startup, from the inclusion of a new investor in the syndicate to decisions about whether to follow-on, and what strategy a startup should follow through to decisions about when and how to exit. These frictions among members of the syndicate not only impact the potential returns to the investors, but have real effects in terms of the growth, survival and direction of portfolio companies as well as the career prospects for entrepreneurs.

A clear implication of these potential frictions is that entrepreneurs need to be careful about how to select and build the syndicate of VCs that back their firm. For example, Hsu (2004) documents how entrepreneurs are willing to accept less favorable terms from more reputable VC investors. The various frictions outlined in this chapter highlight that this is a dynamic problem facing entrepreneurs, with the potential for path dependence. That is, the investors – and particularly the lead investors -- entrepreneurs select in their initial round of financing can impact who is willing to join the syndicate and who is not at a future point in time. Moreover, the incentives facing different types of investors in a syndicate can have a powerful influence on the direction of the company.

The discussion above also suggests that entrepreneurs can benefit greatly from understanding the implication of terms that seem more relevant to frictions between VCs – such as drag along clauses or the seniority of certain classes of preferred stock holders. While not directly impacting the cash flow and control rights of management, they can nevertheless shape the incentives of investors, with significant potential real effects for the venture and the management team.

Finally, many of the issues discussed above could benefit from a deeper and more rigorous understanding of incentive differences and coordination frictions within venture capital syndicates. This seems particularly important given the growing heterogeneity in the types of investors financing early stage ventures. We believe that characterizing them and studying their implications – both in terms of the composition of syndicates and in terms of the consequences on startups – are promising avenues for future research.

⁸ There are further nuances to this clause, but the excerpt above captures the essence of the term.

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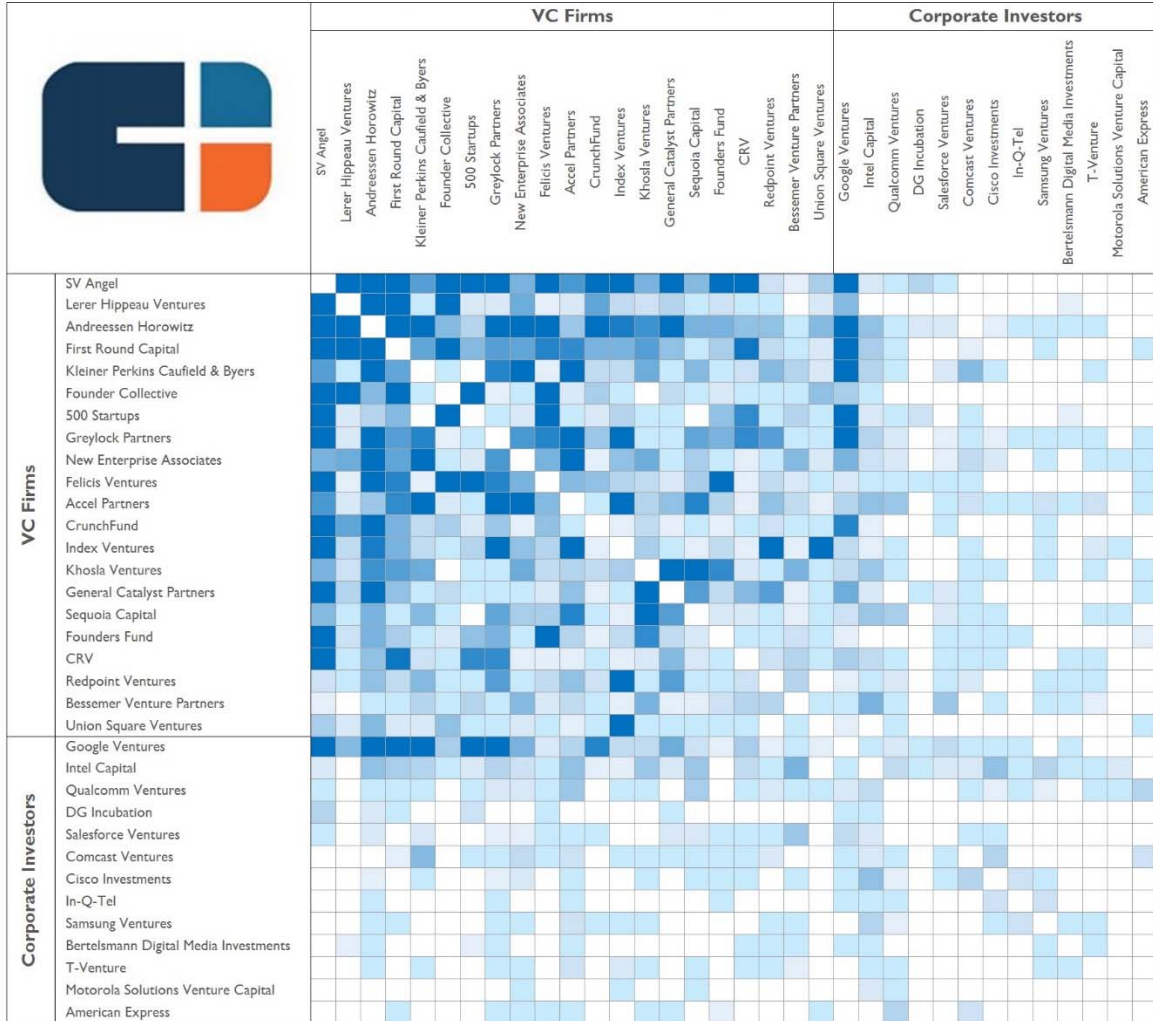
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Figure 1: Venture Capital Investment Syndicate Heat Map



Source: <https://www.cbinsights.com/blog/venture-capital-investment-syndicate-heat-map/>

Table 1

This table is based on data drawn from Thompson Reuter's Venture Economics Database. The sample includes all US-based venture capital deals recorded between January 1, 2002 and December 31, 2016. For these ventures, we calculate the number of VCs that were involved in each round of funding. Descriptive statistics are noted for the full sample of firms, for firms that either failed or were acquired within two rounds of funding, and for firms that receive more rounds of funding within the sample period. The analysis drops all round associated with 3% of firms reported to have received more than 10 rounds of funding. In some instances, the name of the VC firm is undisclosed. Only one "undisclosed VC" is included in the calculation and Venture Economics has poor coverage angel investors, suggesting that the numbers reported in this table are a lower bound of the true number of syndicate members in startup ventures.

	Number of Startups	<i>Average</i>	<i>p25</i>	<i>Median</i>	<i>p75</i>
All startups in sample	19,339	2.97	1	2	4
Startups with no more than two rounds of funding	11,832	2.03	1	2	3
Startups with three or four rounds of funding	4,090	3.75	2	3	5
Startups with five or more rounds of funding	3,417	5.29	3	5	7

Table 2

This table is based on data drawn from Thompson Reuter's Venture Economics Database. The sample includes all US-based venture capital funds raised in the 40 years 1976 to 2015. The table reports the total number of funds raised in each of four decades in this 40 year period, as well as the share of those funds that were in different size categories.

	1976 - 1985	1986 - 1995	1996 - 2005	2006-2015
Number of VC Funds Raised	1,377	1,106	2,543	1,890
Less than \$ 50 M	92%	74%	49%	54%
\$ 50.1 M - \$ 100 M	6%	15%	18%	13%
\$ 100.1 M - \$ 300 M	2%	9%	22%	20%
\$ 300.1 M - \$ 500 M	0.2%	1%	7%	6%
Greater than \$ 500 M	0.2%	1%	5%	6%