

# The Other Side of Grandstanding

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## Abstract

This essay investigates the motivations of venture capital funds (VCs) in originating a syndication and the relationship between capital inflows into the VC industry and syndication. Using a data set on essentially all Israeli VC-backed companies and all VCs that invested in Israel from 1996 to 2007, the essay finds evidence that reciprocity is a strong motivation for syndication between funds, that is, funds invite other funds to invest in their most promising companies, in the expectation that the invited funds will return the favor. In hot periods, more funds enter the market, and the reciprocity motivation to originate a syndication declines due to the intensified competition in the industry. Hence, companies established in hot periods are less likely be backed by a syndicate of funds.

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# 1 Introduction

## 1.1 The Reciprocity Motivation for Syndication

Syndicates, that is, joint investments of at least two VC funds in the same company, are very common in the VC industry. Tian (2011) finds that 70% of the VC-backed companies that received financing from 1980-2005 were backed by syndicates. In this essay we examine the relationship between capital inflows into the VC industry and the motivation of funds to originate a syndicate, and provide a new explanation for the relatively poor performance of companies established in high capital inflow periods (henceforth hot periods).

The literature examines the different motivations for syndication among VCs. Particularly, the literature focuses on the second-opinion motivation suggested by Lerner (1994) and the Value-added motivation suggested by Brander, Amit and Antweiler (2002). Lerner (1994) suggests that syndication improves the screening process, enabling the funds to receive a second opinion on the young companies.<sup>1</sup> Casamatta, and Haritchabalet (2007) provide a theoretical model, where a fund asks for a second opinion on a screened company from another fund. However, identifying the company to another VC is risky, as the advising fund could compete and finance the company exclusively. Hence, as a mechanism to avoid competition the initial fund ought to share the company with the advising fund. Brander, Amit and Antweiler (2002) suggest the value-added rationale for syndication; claiming that the complementary management skills of the syndicate members improve the performance of the companies that they back.

However, Lockett and Wright (2001), using survey data of the UK VC industry to examine rationales for syndication, find that the second-opinion and value-added moti-

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<sup>1</sup>Lerner (1994) finds that in early financing rounds, when the second opinion is more valuable, experienced funds syndicate investments with other experienced funds, while in later financing rounds experienced funds syndicate much more with inexperienced funds.

vations are the least important factors in syndication considerations.

In this essay, we examine whether reciprocity between funds is a motivation for syndication. The reciprocity rationale for syndication suggests that funds invite other funds to invest in their most promising companies, in the expectation that the invited funds will return the favor in the future. Lerner (1994) finds that experienced funds are invited to join syndications shortly before the companies go public. He suggests that in early financing rounds funds invite experienced funds, that are most able to reciprocate, to join in later financing-rounds of their best deals. Bygrave (1987) argues that a primary motivation for syndication is to share information. Funds share information on companies (through syndication) on the assumption that the sharing will be reciprocated. Hochberg, Ljungqvist and Lu (2007) find that past investment by funds into a syndicate results in many co-investment opportunities in the future. Hence, the authors argue that reciprocity is a motivation for syndication between funds. Hochberg, Ljungqvist and Lu (2010) show that a fund is more likely to be able to enter a new market if it first gives an incumbent reciprocal access to deal flow in its home market.

If reciprocity is a strong motivation for syndication then we hypothesize that: (a) a fund will invite other funds to join a syndicate to support its strongest companies (otherwise the invited funds have no reason to reciprocate); (b) the invitation to join a syndicate translates into more co-investment between the inviting and the invited funds.

We test the reciprocity hypothesis with a unique data set on essentially all Israeli VC-backed companies and all VC funds that invested in Israel from 1996 to 2007.<sup>2</sup> We start with identifying the fund that screens the deal and originates the syndication. However, as researchers we know which funds participate in the syndication, but are unable to identify the fund that originates the syndication. Hence, we define “reciprocity companies” as companies whose first VC financing, in the first or the second financing rounds, is from

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<sup>2</sup>The data was collected by IVC Research Center, which is a privately owned institution. The IVC database includes detailed listings of Israeli companies and venture capital funds.

one VC, and whose subsequent funding is from a syndicate of funds (including the first VC) in the next financing round. For those companies we know with high certainty which fund is screening the deal, and which funds are invited to syndicate.

We find that the probability of a reciprocity company reaching a successful exit is significantly higher than that of other companies that received VC funding in an early round of financing, either from a syndicate of funds, or from only one fund).<sup>3</sup> This finding suggests that funds invite other funds to invest in later financing rounds of their most promising companies.

Next, as the invitation to invest in a promising company is intended to translate into many more co-investments between the inviting and the invited funds, we ask whether an invitation to join a syndicate has a positive impact on the number of co-investments (syndications) in different companies. We find that funds syndicate in more companies, if one of the syndicated companies is a reciprocity company. In other words, a fund has stronger relations, in terms of number of co-investments, when it is invited to invest in another fund's strong company. These findings support the reciprocity motivation for syndication.

## 1.2 Syndication and Capital Inflows

Boom and bust cycles in the VC industry are a well-documented phenomenon (Gompers and Lerner, 2004, Gompers, Kovner, Lerner and Scharfstein 2008, Kaplan and Stromberg, 2009, Kaplan and Lerner, 2010, Harris, Jenkinson and Kaplan, 2014). In such a cycle,

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<sup>3</sup>A successful exit is defined as an early stage investment (the first or second financing round) in a company that was sold to the public through an IPO, or was acquired by other companies with a deal value to total investment ratio exceeding three. Selling companies to the public via IPOs is the most profitable channel by which VC funds exit from companies. Gompers and Lerner (2000) cite a 1988 study by Venture Economics, which finds that the average return on IPOs is 195% in an average holding period of 4.2 years. Acquisition yields a return of 40% over a mean holding period of 3.7 years. The reason that we do not use the common classification of successful exit as a company that goes public or is acquired, is that this classification overstates the number of successful companies. Many of the acquired companies yielded a negative return to their investors.

a period of strong performance of VC funds leads to a hot period of high capital inflows and the establishment of relatively poorly performing funds, followed by a period of low capital inflows.

Gompers and Lerner (2000) provide an explanation for the poor performance of companies established in the hot periods of high capital inflows. They argue that capital inflows into the VC industry increase the valuations of the financing rounds, even though the probability of success of the companies remains unchanged. The higher valuations stem from the fact that in hot periods more VC funds compete to finance a limited small number of strong companies (the phenomenon of money chasing deals). One outcome is that new entrants are less likely to get a seat at the table in financing the most promising companies.

In this paper we suggest additional explanation for the poor performance of companies established in hot periods that links the motivation to syndicate with capital inflows into the VC industry. In hot periods, more funds enter the market and compete to finance a limited number of strong companies. Therefore, funds are less likely to screen the most promising companies, and are less likely to raise a follow-on fund.<sup>4</sup> We argue that in hot periods, funds are less likely to invite other funds to invest in their promising companies. Since the other funds are less likely to screen strong companies by themselves and reciprocate the gesture in the future, a fund that does screen a strong company has

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<sup>4</sup>The relation between successful exits of VC-backed companies and follow-on fundraising is well documented. Gompers (1996) shows that young VCs time their follow-on fundraising sooner after they sell companies through IPOs than more experienced VCs, and that the number of companies that exit through IPOs has a positive impact on the size of those follow-on funds. Gompers and Lerner (1998) find that the equity value of VC-backed companies that were sold via IPOs is positively related to the probability of raising a follow-on fund and to the size of the fund. Kaplan and Schoar (2005) find that the size of the follow-on fund (in \$ million) is positively related to the performance of the preceding fund. Chung, Sensoy, Stern and Weisbach (2012) show that the preceding fund's IRR has a positive and significant relation with the probability of raising a follow-on fund. An increase of 1% in IRR relative to the sample mean is associated with an increase of roughly 0.3% in the probability of raising a follow-on fund. Hochberg, Ljungqvist and Vissing-Jorgensen (2014) show that the interim IRR of the preceding fund at the time of fundraising increases the likelihood of raising a follow-on fund, and the size of the GP follow-on fund.

a lower reciprocity motivation to originate syndication. Hence, the competition between the funds has a negative impact on syndication, which translates into a lower probability of success of the investee company.

There is a large body of literature on the relationship between syndication and company performance. Tian (2011) finds that syndicated companies are more likely to have a successful exit, enjoy lower IPO underpricing, and receive a higher IPO market valuation. Brander et al. (2002) find that syndicated companies have higher returns than standalone companies (companies that were funded by a single VC). Wang and Wang (2012) show that the syndication size (in terms of the ratio of domestic VCs participating in the syndicate) has a positive and highly significant effect on the company's probability of having a success exit. Aks (2016) examines a data set of Israeli VC funds, and shows that the number of funds participating in a financing round is negatively correlated with the company write-off hazard. We hypothesize that in hot periods (of high capital inflows) the reciprocity motivation for syndication is weaker. Hence funds syndicate less deals in hot periods, which, in turn, has a negative impact on the company's performance.

To test this hypothesis, we distinguish between experienced and inexperienced funds. Hsu (2004) and Sorensen (2007) show that experienced VCs are more likely to be matched with the most promising companies. Hence, experienced funds are the ones that are more likely to share strong companies with other funds, and are more able to reciprocate. In other words, the reciprocity motivation is expected to play a greater role in the experienced funds' syndication decisions.

The essay finds that a capital inflow of \$1 billion to the VC industry is associated with a decline of 13.5% in the probability of a company being backed by a syndication of experienced funds. In other words, conditional on receiving funding from an experienced fund, in hot periods companies are less likely to be backed by a syndication of experienced funds.

In hot periods, more funds enter the market and the average size of the entrants, in terms of \$ million, is bigger. Our data show that the average size of experienced funds established in the bubble years of 1999-2000 is \$189 million compared with an average size of \$123 million for experienced funds established in other years (1996-1998; 2001-2007). Lockett and Wright (2001) show in a survey on UK VC funds that traditional finance motivations for syndication such as the deal size in proportion to the size of the fund are the most important factor in the fund's decision to syndicate a deal. Hence, an alternative explanation for the negative relationship between capital flows and syndication is that funds are less capital constrained in hot periods. To test whether the financial motivation or the reciprocity motivation lead to lower syndication in hot periods, we examine the impact on the syndication size of companies backed by experienced funds (the number of funds participating in the companies' early-stage financing rounds), of the fund size normalized by the number of portfolio companies (a proxy for the fund's financial constraints), and of the number of new experienced funds that entered the market in the current investment years (a proxy for the degree of competition of the funds), and other controls. We find that both the fund size normalized by the number of portfolio companies, and the number of new experienced funds have a significant negative impact on the syndication size while. This finding suggests that both financial and reciprocity motivations plays a strong role in the funds' syndication decisions.

Our essay suggests that funds are less likely to share strong deals with other funds in hot periods. Experienced funds are more likely to screen the most promising companies, hence, we hypothesize that in cold periods, a standalone company backed by an experienced fund is not promising enough to receive funding from a syndicate. However, in hot periods, a standalone company backed by an experienced fund is less likely to be syndicated due to lower the reciprocity motivation, and not due to its prospects. To test this hypothesis, we measure whether standalone companies backed by a single ex-

perienced fund that were established in hot periods are more likely to have a successful exit than standalone companies backed by an experienced fund that were established in cold periods. We find that capital inflows are positively correlated with the probability of success of standalone companies backed by an experienced fund, whereas this relationship is insignificant for standalone companies backed by an inexperienced fund.

The rest of the essay is organized as follows. Section 2 describes the data. Section 3 presents the empirical results of the analysis of reciprocity as a motivation to originate syndication. Section 4 reports the empirical results of the relationship between capital inflows and syndication. Section 5 focuses on the survival of companies and the relation with VC reputation. Section 6 concludes. The Appendix includes a variable description table.

## 2 Data

We use data collected by IVC Research Center, which is a privately owned institution that monitors and collects detailed information on Israeli high-tech companies and investors. IVC covers virtually all Israeli VC-backed companies and Israeli VC funds.<sup>5</sup>

The Israeli VC industry emerged as a governmental initiative (the Yozma program, 1993-1998) that invested in 10 different new VC funds, and in one owner-managed VC fund (Avinmelech and Teubal, 2006). These were the first local VC funds. Today, Israel is considered one of the biggest clusters for VC investment.<sup>6</sup> In 2015 Israeli VC-backed deals reached the level of \$3.2 billion (IVC, Capital Raising Report, 2016).

The data set contains data on Israeli VC funds invested in Israeli companies. We monitor the companies' evolution up to the second quarter of 2013. To ensure a sufficient

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<sup>5</sup>We focus only on VCs that are structured as limited partnership, and manage over \$10 million. The large majority of Israeli VC funds are indeed structured as limited partnership. Avnimelech and Teubal (2006) document only seven public VCs that were established before 2005.

<sup>6</sup>In 2010, Israel led the world in venture capital invested per capita.(The Economist, January 21, 2012).



amount of time to observe the development of the companies and the funds, the coverage is limited to funds that were established between 1996 and 2007.

## 2.1 Characteristics of VC Funds

Table 1 reports descriptive statistics for the funds. We distinguish between funds that were established in the bubble period of 1999-2000 and funds that were established in the full-sample period excluding the bubble years (1996-1998; 2001-2007, henceforth "other years"), and between inexperienced and experienced funds. Inexperienced funds are first-time funds raised by new VC firms, while experienced funds are follow-on funds raised by existing VC firms.

During the Internet bubble years of 1999-2000 many VC-backed companies went public via IPOs, and funds reported on exceptionally strong performance,<sup>7</sup> which led to high capital inflows into the VC industry. The data show that during the bubble years local funds raised \$4 billion out of \$11 billion raised between 1996 and 2007.

The first row of Table 1 supports the finding of Kaplan and Schoar (2005) that inexperienced funds choose to enter the market in periods of strong VC fund performance. The data show that 22 (63%) of the 35 funds raised in the bubble years are first-time funds (inexperienced funds), compared to only 34 (47%) out of the 73 funds raised in other years.

Of the 108 funds, 52 were followed by a subsequent fund (successful fundraisers). However, only 6 out of the 22 (27.3%) inexperienced funds established in the bubble years were followed by a subsequent fund, compared with 13 out of 34 (38.2%) inexperienced funds established in other years. This pattern was also observed by Kaplan and Schoar (2005), who show that the performance of inexperienced funds established in hot periods is significantly lower and they are therefore less likely to raise a follow-on fund

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<sup>7</sup>The US VC fund index, which measures the return between two points in time reported by the NVCA, shows an outstanding IRR of 85.42% (quarterly basis) in the last quarter of 1999.

VC funds specialize in either early-stage investing or late-stage investing. We classify a fund as an early-stage fund if more than 50% of its first investing in new companies is in early-stage financing rounds (the first or second financing rounds). The data show that 96 out of the 108 local funds are classified as early-stage funds. This is not surprising since many local companies at late-stages shift their activity to the US.

In the entire coverage period (1996-2007), the average fund size is \$93 million, which is smaller than the size for the average US VC fund.<sup>8</sup> However, the data suggests that experienced funds tend to raise bigger funds when the VC industry performs well. The average size of experienced funds established in the bubble years is \$189 million, compared with an average size of \$123 million for experienced funds established in other years. However, the data show that the inexperienced fund size is around \$50 million in all the sample years.

Next, the table presents the average fund portfolio size in terms of number of investee companies. On average, a fund invests in 17.7 companies (portfolio companies). More interesting is the relationship between the fund size in terms of capital and the number of portfolio companies. The data show that the average investment of an experienced fund in a company is \$6.1 million, higher than the \$3.9 million for an inexperienced fund. In other words, the relationship between the fund size and the number of backed companies is concave. Kaplan and Schoar (2005) suggest that the VC industry is characterized by some diseconomies of scale in the VC industry, such as a general partner (GP) human capital constraint.<sup>9</sup> As a rule of thumb, each GP is responsible for 7-10 portfolio companies. If highly quality GPs are scarce, then bigger funds might choose to invest more capital in

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<sup>8</sup>Hochberg et al. (2014) report an average size of \$111.2 million for US VC funds. Their sample is based on 2,257 US venture capital funds raised by 962 VC firms between 1980 and 2002. Chakraborty and Ewens (2014) report an average fund size of \$263.4 million, based on all entrepreneurial firm financings between 1992 and 2013 for which a VC investor had a fund close before 2007. Metrick and Yasuda (2010) report an average size of \$322 million. Their sample consists of 94 US venture capital funds raised between 1993 and 2006.

<sup>9</sup>Kaplan and Schoar (2005) find that top performing funds in the private equity industry grow less proportionally with the increase in performance than do the lower performers.

fewer companies, rather than to hire lower quality GPs and increase the portfolio size.

The last row of Table 1 provides some data on the performance of the funds. Inexperienced funds entering in the bubble years manage to bring 0.8 companies to a successful exit, which is less than the rate of 1.4 successful exits for inexperienced funds established in other years. We do not find a similar pattern for experienced funds; those funds established during the bubble years (other years) have 2.4 (2.0) successful exits. This finding might reflect the fact that funds compete to finance the most promising companies, and in hot periods first-time funds find it much harder to get a seat at the table in financing the most promising companies.

**Table 1**  
**Characteristics of VC Funds**

	“Bubble years” (99-00)		“Other years” (96- 98; 01- 07)		96-07
	Inexp. funds	Exp. funds	Inexp. funds	Exp. funds	All funds
No. of funds	22	13	34	39	108
Successful fundraisers	6	8	13	25	52
No. of early-stage funds	18	12	30	36	96
Fund size (\$ m)	51	189	49	123	93
Portfolio size (per fund)	11.8	27.7	13.4	21.4	17.7
Successful exits (per fund)	0.8	2.4	1.4	2.0	1.6

## 2.2 Characteristics of VC-Backed Companies

The data set covers 1,018 VC-backed companies. Table 2 reports descriptive statistics of the early-stage VC-backed companies, that is, companies that received funding from at least one VC in the early-stage financing rounds (the first or the second financing rounds). We distinguish between companies that received funding from one VC, “standalone companies”, and companies that received funding from a VC syndicate, “syndicated companies”. “ The data set indicates some significant differences between the standalone and syndicated companies. Table 2 shows that the average establishment quarter of first (second) financing round syndicated companies is about two years (one year) earlier than

that of standalone companies. This finding reflects the higher rate of syndication in the first years of the local VC industry (following the establishment of the Yozma program) that appears in our data set. Out of all the first (second) financing round syndicated companies, 32% (33%) were founded before 1999, compared to only 12% (21%) of the first (second) financing round standalone companies. A possible explanation for the high rate of syndication in the period following the emergence of the VC industry is capital constraints: the average size of the 11 Yozma funds is \$ 23 million. Small funds might not have the capacity to exclusively finance deals; hence, they syndicate deals with other funds.

The average size of standalone companies' first (second) financing round is \$3.8 million (\$6.5 million) and of syndicated companies first (second) financing rounds it is \$5.7 (\$8.5 million). This finding is consistent with Lockett and Wright (2001) who indicate traditional finance motivations such as the deal size in proportion to the size of the fund, or the average deal size, as the most important factors in the decision to syndicate.

Companies have several exit channels: they can proceed to an IPO, be sold to another company, or written-off (liquidated). Our data show that 180 companies did not survive beyond the first funding round, and 120 of them were written off. Of the write offs, 104 were standalone companies, and 16 were syndicated companies. Table 2 shows that syndicated companies had, on average, almost one more financing round than the standalone companies. This difference is highly significant, and indicates the lower probability of syndicated companies being liquidated and not surviving beyond the first funding round.

The total capital raised by the syndicated companies is higher by roughly \$10 million than that of the standalone companies. This difference mirrors both the larger early-stage financing rounds of syndicated companies, and the higher probability of syndicated companies surviving beyond the first funding round.

Angel investors are high net-worth individuals, mostly ex-entrepreneurs, who invest

**Table 2**  
**Characteristics of VC-Backed Companies**

	First financing round			Second financing round		
	Standalone companies	Syndicated companies	t(diff)	Standalone companies	Syndicated companies	t(diff)
No. of companies	510	172		421	231	
Vintage quarter	2002Q2	2000Q3	5.39***	2002Q1	2001Q1	2.96***
Financing round size (\$ m)	3.8	5.7	-2.21**	6.5	8.5	-1.94*
Average No. of financing rounds	2.9	3.7	-4.09***	3.6	4.3	-4.21***
Total capital raised (\$ m)	20.5	30.5	-2.91***	21.5	31.8	-3.43***
Angel participated in round (% of companies)	16.1	19.8	-1.01	14.0	19.0	-1.63
Successful exit rate (% of companies)	11.2	19.8	-2.56**	12.4	22.1	-3.07***
Liquidation rate(% of companies)	41.4	30.8	2.54**	33.5	23.4	2.80***

their own accounts. A syndicate of a VC fund and an angel might be a substitute for a syndicate of funds. Table 2 does not indicate significant differences between standalone and syndicated companies in the share of angel-fund syndication. Nevertheless, though insignificant, the share of syndicated companies that received angel funding is higher, which may suggest that those companies are more attractive (more likely to make a successful exit) than standalone companies.

Last, syndicated companies whether in the first or the second financing rounds, were more likely to have a successful exit, and less likely to be writtenoff. Those differences are highly significant. Clearly, these findings do not indicate on causality, that is, whether syndication adds value to the companies, or stronger companies attract more funds (syndication).

### 3 The Reciprocity Rationale for Syndication

In this section, the essay asks whether reciprocity is a strong motivation to syndicate investments, that is, whether a fund invites another fund to syndicate investments, in the expectation that the invited fund will return the favor in the future. To test the reciprocity hypothesis empirically, we have to show: (a) funds invite other funds to syndicate in their most promising companies (companies with a higher probability to have a successful exit), otherwise the invited fund will have no reason to reciprocate; (b) the invited fund reciprocates, that is, the invitation leads to more syndications between the inviting and the invited funds.

As a starting point, Table 3 shows descriptive statistics of the relationship between pairs of funds, that is, the number of early-stage syndications in different companies of fund pairs, conditional on syndicating in at least one company. We distinguish between syndications of inexperienced funds (first-time funds), inexperienced-experienced funds, and experienced funds. This is important, because inexperienced funds and experienced funds might have different motivations for syndicating.

Table 3 shows that 564 pairs of funds syndicated investments. The most striking point is that in 77.13% of the cases, pairs of funds syndicated only one investment. This finding is rather surprising on the basis of the adding-value hypothesis that funds syndicate investments due to complementary abilities, and the second-opinion syndication hypothesis that funds syndicate investment to receive a second opinion, which lead to the expectation that pairs of funds will have stronger relations in terms of number of syndicated companies. However, a reciprocity motivation for syndication suggests a similar pattern of relations. If funds share strong investments to gain access to strong investments in the future, then an optimal choice for the fund is to syndicate strong investments with different funds. In this way, the inviting fund increases the probability of gaining access to strong companies in the future, each of which might be screened by other invited funds.

Table 3 also finds that pairs of experienced funds have stronger relations than pairs of inexperienced funds or of inexperienced-experienced pairs. In 27.6% of the cases, pairs of experienced funds syndicated investments in more than one company compared with rates of 21.0% and 19% for experienced-inexperienced funds, and inexperienced funds, respectively.

**Table 3**  
**Relations between VC Funds**

No. of relationships	Syndication types			Total
	Inexp-Inexp.	Inexp.-Exp.	Exp.-Exp.	
1	94 (81.0%)	199 (79.0%)	142 (72.5%)	435 (77.1%)
2	18 (15.5%)	38 (15.1%)	39 (19.9%)	95 (16.8%)
3	3 (2.6%)	10 (4.0%)	8 (4.1%)	21 (3.72%)
More than 3	1 (0.9%)	5 (2.0%)	7 (3.6%)	13 (2.3%)
Total	116 (100%)	252 (100%)	196 (100%)	564 (100%)

### 3.1 The Probability of Company Success

In researching the motivation for syndicate funding to invest in the most promising companies, we have an identification problem. We know which funds syndicate, but we do not know which fund originated the syndication, and which fund was invited to join the deal. Hence, to address this issue, we defined companies that received funding from one VC in the first financing round, and from a syndication of funds in later financing rounds (capped to the third financing round) as “reciprocity companies”. For those companies we know which was the lead fund, that is, the fund originated the syndicate and which funds were invited to join the deal.

Table 4 presents the results of a logistic estimations model in which we relate the likelihood of a company having a successful exit to its characteristics, funds characteristics

and market conditions. The dependent variable is a dummy equal to one if a company makes a successful exit, that is, is sold to the public via an IPO, or is acquired by another company with a deal value to total investment ratio exceeding three.<sup>10</sup> The main variable of interest is the dummy variable reciprocity, which equals one if a company is defined as a reciprocity company.

By definition reciprocity companies received funding from one fund in their first VC financing round, and have survived beyond the first financing round. Column (1) shows the results of standalone companies (companies that received funding from one fund in their first VC financing round) that have had at least two financing rounds. The coefficient on the reciprocity variable is positive and significant. The economic magnitude of this variable is meaningful: At the covariate's mean point, the reciprocity company's probability of success is 28%, compared with a probability of 12% for a standalone company. The dummy variable of angel funding (equal to one if at least one angel participated in the financing round) has a statistical and economical impact on the company's probability of having a success exit that is positive and highly significant impact. At the covariate's mean point, the participation of an angel increases the company's probability of success to 32.8% from a level of 13.6%. The negative coefficient on the variable "market performance" indicates a well-documented phenomenon, namely, companies established in hot periods are less likely to succeed.

In Column (2) we do not restrict the analysis to standalone companies and add companies that received syndicate funding in their first VC investment. So the dummy reciprocity distinguishes between two groups of companies: (1) companies that received funding from one VC in the first VC investment, and from a syndicate of funds in later rounds (capped to the third financing round); and (2) companies that received funding from either one or a syndicate of funds in their first VC financing round. The coefficient

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<sup>10</sup>In unreported regressions we use others deal value to total investment cutoffs to define successful exits, the main results remain unchanged.



on reciprocity remains significant and positive (at 1.8%).

Column (3) reports the probability of success of companies in the subsample of companies that first received VC in the bubble period of 1999-2000. In this period of strong performance of the VC industry, when many companies were taken to the public, the probability of success of reciprocity companies remains significantly higher than that of other companies

Table 4 shows that reciprocity companies are more likely to make a successful exit, than other companies backed by VCs in early-stage financing rounds. This result suggests that funds invited other funds to join their most promising companies. The results are not driven by the size of the financing round. In an unreported regression we add as an explanatory variable the size of the second financing round, and the coefficient on the reciprocity company remained highly significant.

### 3.2 Strength of Relations between Funds

The reciprocity rationale for syndication hypothesis predicts that the funds share their strong companies with other funds to gain access to a better deal flow. Hence, a fund is expected to have stronger relations in terms of number of investments in different companies when it invites another fund to syndicate. In particular, we ask whether the fact that one of the syndicated companies is a reciprocity company has a positive impact on the number of syndications between a pair of funds. To test the impact of reciprocity on the strength of the relationship between pairs of funds we use the following equation:

$$\begin{aligned} (No. \text{ of syndication between funds}_{m,n} | One \text{ syndication}) &= \alpha + \beta(Reciprocity \text{ dummy}) + \\ \nu(No. \text{ of successful exits}) &+ \lambda(Market \text{ performance}) + \psi(Mutual \text{ activity period}) \\ + \gamma(VCs \text{ characteristics controls}) &+ \delta(Year) + \varepsilon_{m,n} \end{aligned}$$

Table 5 investigates the number of early-stage financing rounds syndications in dif-

**Table 4**  
**Company's Probability of Success**

Columns (1)-(3) report logistic estimations of the company's probability of making a successful exit. The unit of observation is the company. Variables are defined in appendix, Table (A1). The dependent variable is a dummy equal to one if the company makes a successful exit. A successful exit is a company that is taken public, or is acquired by other companies with a ratio of deal value to invested capital exceeding three. We define the lead VC fund as follows: in financing rounds with only one VC fund, this VC fund is defined as the lead VC, in financing rounds with more than one VC fund, the lead VC is defined as the most reputable VC in the round. Robust p-values, cluster-adjusted on VC fund, are in brackets below the parameter estimates. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5 and 1 percent level, respectively.

	Standalone companies 1996-2007	All companies 1996-2007	All companies 1999-2000
Reciprocity	1.265** (0.507)	0.910** (0.397)	1.577*** (0.600)
Angel	1.503*** (0.455)	0.989*** (0.328)	0.779 (0.541)
Foreign VC	0.581 (0.425)	-0.010 (0.359)	0.362 (0.633)
Lead VC Sequence	-0.297 (0.231)	-0.160 (0.189)	0.020 (0.466)
Lead VC portfolio size	-0.087** (0.039)	-0.072** (0.031)	-0.061 (0.050)
Lead VC capital	0.008* (0.004)	0.008*** (0.003)	0.003 (0.005)
R1 amount	-0.011 (0.022)	0.005 (0.011)	-0.064 (0.070)
Market performance	-0.629** (0.282)	-0.523* (0.270)	-0.748** (0.334)
Industry	Yes	Yes	Yes
Year	Yes	Yes	No
Constant	-0.069 (0.957)	-0.603 (0.790)	-1.038 (1.347)
$\chi^2$	61.205	65.074	21.909
N	257	374	145

ferent companies by a pair of funds conditional on syndicating in at least one company. On average, a pair of funds syndicate in 1.3 different companies (conditional on syndicating in one company). Column (1) of Table 5 reports on all the pairs of funds that syndicated investments. The coefficient on the dummy variable “reciprocity” is positive and highly significant. A syndication in a reciprocity company increases the number of syndications between the inviting and the invited funds by an additional 0.3 companies. The variable “number of successful exits” is the average number of exits by companies in which a pair of funds have invested other than the syndicated companies. This variable is a proxy for the reputation of the syndicating funds. The coefficient on this variable is

positive and strongly significant, implying that successful funds have stronger relations with other successful funds. The variable “mutual activity period” measures the number of overlapping quarters in which the pair of funds are still investing in new companies. As expected the length of the mutual activity period is positively correlated with the number of syndicated deals.

The Column (2) of Table 5 reports the relations between inexperienced funds, that is, pairs of first-time funds. If funds syndicate investments to gain access to a better deal flow then: (a) funds that are more likely to screen strong companies are the ones that invite other funds; (b) experienced funds are more likely to be invited to syndicate investments (Lerner, 1994). The coefficient on reciprocity is negative and insignificant. This finding is not surprising since inexperienced funds are less likely to screen strong companies and for the same reason they are less likely to be invited to syndicate.

Column (3) of Table 5 reports the relations between inexperienced and experienced funds. The coefficient on reciprocity is positive and significant. Column (4) reports the relations between experienced funds. The coefficient on reciprocity is positive and highly significant. Column (4) shows that the economic magnitude of syndicating in a reciprocity company on the number of syndicated deals is the strongest for pairs of experienced funds. These are the funds for which the reciprocity rationale plays a role in their syndication decisions.

To summarize, the main findings of this section are that: (a) a fund invites another fund to syndicate in its most promising companies; and (b) such an invitation has a positive and significant impact on the number of syndications. These findings suggest that reciprocity plays an important role in the fund’s syndication decisions. Moreover, they corroborate Lerner’s (1994) finding that experienced funds are invited to invest for the first time in later financing rounds following sharp increase in valuations. Lerner suggests that “...venture capitalists should offer shares in the best deals to those firms

most able to reciprocate: well-established venture firms. Venture capitalists should be less likely to offer such opportunities to less established venture organizations.”

**Table 5**  
**Reciprocity rationale for Syndications**

Columns (1)-(4) report OLS estimations of relations between VCs. The unit of observation is a pair of VCs that syndicate investment. Variables are defined in appendix, Table (A1). The dependent variable is the number of syndicated firms, i.e., the number of firms in which a VC pair syndicated an investment in one of its first three financing rounds. VC characteristics include the average capital raised by the VC pair (\$ m), and the average number of portfolio companies in which the VCs pair invested. Robust p-values are in brackets below the parameter estimates. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5 and 1 percent level, respectively.

	(1)	(2)	(3)	(4)
Reciprocity	0.278*** (0.095)	-0.408 (0.297)	0.327** (0.158)	0.433*** (0.137)
No. of successful exits	0.036*** (0.009)	0.028 (0.028)	0.029* (0.016)	0.025* (0.014)
Market performance	-0.084* (0.046)	-0.062 (0.107)	-0.096 (0.073)	-0.072 (0.073)
Mutual activity period	0.016** (0.007)	0.008 (0.015)	0.007 (0.011)	0.029*** (0.011)
VC characteristic	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Constant	1.729*** (0.381)	3.816*** (0.826)	0.956 (0.668)	0.579 (0.763)
$R^2$	0.124	0.292	0.135	0.18
N	512	91	228	193

### 3.3 Robustness Check: Reciprocity vs. Company Financial Needs

We show that funds invite other funds to invest in later financing rounds of their promising companies. We attribute this to the fund’s reciprocity motivation. It is plausible, however, that the most promising companies raise more capital in early financing rounds in order to arrive faster to market. Hellman and Puri, 2000, find that one of the VCs’ objectives is to quickly bring a product to the market; our data set shows that the syndication size (the number of funds participating in a financing round) shortens the

**Table 6**  
**Robustness Check I: Reciprocity vs. Company Financial Needs**

Table 6 presents logit estimates for a regression of the company's probability of success. The unit of observation is a particular company that is backed by one VC in its first financing round and by at least one VC in its second financing round. Variables are defined in appendix, Table (A1). The network controls are "Invited other VCs" and "Invited by other VCs". Robust p-values are in brackets below the parameter estimates. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5 and 1 percent level, respectively.

R2 amount (\$ m)	0.018 (0.022)
R2 syndication	0.495** (0.226)
Market performance	-0.597*** (0.215)
Angel	1.414*** (0.449)
Foreign VC	0.442 (0.401)
Lead VC sequence	-0.199 (0.223)
Lead VC portfolio size	-0.072* (0.037)
Lead VC capital	0.006 (0.004)
R1 amount (\$ m)	-0.041 (0.070)
Industry	Yes
Year	Yes
Network controls	Yes
Constant	542.240*** (171.507)
chi <sup>2</sup>	36.525
N	222

duration to successful exit.<sup>11</sup> Thus, an alternative explanation to our findings is that funds syndicate out their strong companies to raise larger financing rounds.

To test this alternative explanation, we examine companies that received funding from one VC in the first financing round, and from one or a syndication of funds in the

<sup>11</sup>In an unreported regression we use the Cox proportional hazard rate model to estimate the companies' successful exit hazard. We find that syndication size increases the company's successful exit hazard and shortens the duration to this final outcome.

second financing round. We ask the following questions: whether the size of the second financing round (in terms of \$ m) is correlated with the company’s probability of having a successful exit.

Table 6 shows that the size of the second financing round is not correlated with the company’s probability of success (conditional on receiving funding from one VC in the first financing round and at least one VC financing in the second financing round). Hence, we can rule out the case that stronger companies, i.e., companies that are more likely to have a successful exit, raise more capital in the second financing round than other companies that reach the second financing round, which leads to larger syndications.

## 4 Syndication and Capital Inflow

There is a large body of literature on the negative relations between capital inflows into the VC industry and the performance of funds that enter the market in those hot periods. Kaplan and Schoar (2005) find that the return on inexperienced funds is negatively correlated with the number of funds that started in the same year as a given fund. Gompers et al. (2008) find that inexperienced funds do not scale up investment when the investment opportunities improve as much as more experienced funds do. They suggest that this finding is consistent with the “money chasing deals” hypothesis, (Gompers and Lerner, 2000), and argue that due to the increasing competition in such an environment, inexperienced funds cannot get a “seat at the table” in the deals.

In this section, we suggest a new explanation for this negative relationship. Our hypothesis is based on the phenomenon of money chasing deals as well. We argue that increasing competition between funds has a negative impact on the fund’s reciprocity motivation to originate syndication. This, in turn, leads to less syndicated deals, and has a negative impact on the company’s probability of success.

The intuition is as follows. A standalone investment leaves the fund the whole company's NPV. If the fund originates a syndication, however, it increases the company's NPV, but the fund has to share it with the invited fund. In return, the inviting fund, expects to get a share from a promising company of the invited fund in the future. In hot periods, due to the limited number of strong companies and the large number of active funds, it is less likely that the other funds will screen a promising company and reciprocate. Hence, it is optimal for a fund that screens a strong company, not to originate syndication, and to keep a larger share of a smaller company for itself.

The main variable of interest is capital inflows, which equals the total committed capital of funds that enter the industry in the first financing round year. The annual commitments to new funds established in the the years 1996-2007 is \$0.9 billion, and ran in the range of\$23 million to \$2.8 billion, the average syndication size in the first financing round is 1.35 funds (conditional on receiving funding from at least one fund). Column (1) of Table 7 shows that the coefficient on the capital inflows variable has a negative and highly significant effect on the probability of a company being backed by a syndication of funds in the first financing round. The impact on higher capital inflows has a large and significant economic magnitude; an increase of \$100 million in capital inflows decreases the average syndication size by -0.27 funds. This finding corroborates Tian's (2011) analysis of syndication patterns in the US market.

The coefficient on "angel" is positive and significant. The positive relationship between angel-fund syndication and between-funds syndication suggests that companies that manage to attract many funds also manage to receive angel financing. We suggest that this finding indicates that promising companies manage to raise capital from various investors. The first financing round size has an insignificant relationship with the number of funds participating in the syndication.

In the bubble years of 1999-2000 local funds raised about \$4 billion out of \$11 billion

that were raised in the period 1996-2007. The negative relationship between capital inflows and the first financing round syndication size presented in Column (1) of Table 7 might reflect some unobservable factors that are associated with the bubble period. As a robustness check, in the second column of Table 7 we excluded companies that were established in the bubble period (1999-2000). Column (2) findings show that capital inflows remain a critical and negative determinant of the first financing round syndication size.

Our results indicate that capital inflows is negatively correlated with the syndication size, due, we believe, to lower reciprocity motivation for syndication. High capital inflows reduce the reciprocity motivation of funds that screen the promising companies to share them with other funds.

#### **4.1 Inexperienced vs. Experienced Syndications**

The reciprocity motivation for syndication posits that funds originate syndications to gain access to a strong deal flow in the future. Since experienced funds are more likely to be matched with the most promising companies (Hsu, 2004; Sorensen, 2007), they are more likely to share strong deals and to reciprocate. Hence, the reciprocity motivation for syndication is more relevant for these funds.

We turn to explore which types of syndication are more affected by capital inflows. To this end, we classify companies by the expertise of the funds participating in the first financing round. We distinguish between standalone companies, that is, companies that received funding in the first financing round from one VC fund (inexperienced or experienced), inexperienced-experienced syndication companies, that is, companies that received funding from a syndication of inexperienced and experienced funds, and inexperienced (experienced) syndication companies, that is, companies that received funding from a syndication of inexperienced funds or of experienced funds. All together we end up with



**Table 7**  
**Syndication Size and Capital Inflows**

Table 7 presents OLS estimations of the first financing round syndication size (conditional on receiving a VC funding). A unit of observation is a particular company. Variables are defined in appendix, Table (A1). Column (1) reports on all companies that were backed by Israeli VC funds established in the years 96-07. In Column (2) we exclude companies that were established between 1999-2000. The dependent variable is the number of VCs participated in a specific round, conditional on VC investment in that round. The network controls are “Invited other VCs” and “Invited by other VCs” variables. Robust P-values, cluster-adjusted on lead VC fund, are in brackets below the parameter estimates. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5 and 1 percent level, respectively.

	R1 syndication (1)	R1 syndication (excl. 99-00) (2)
Capital inflows (\$ m)	-0.003*** (0.001)	-0.003*** (0.001)
Market performance	0.040 (0.027)	0.284 (0.429)
Angel	0.183** (0.090)	0.160 (0.100)
Foreign VC	0.015 (0.061)	-0.056 (0.100)
R1 amount (\$ m)	0.003 (0.003)	0.004 (0.003)
Lead VC Sequence	0.082** (0.032)	0.098** (0.040)
Lead VC capital	0.000 (0.000)	-0.000 (0.000)
Industry	Yes	Yes
Network controls	Yes	Yes
Constant	3.565*** (0.522)	3.434*** (0.556)
R <sup>2</sup>	0.172	0.214
N	506	327

five groups of companies: inexperienced standalone companies, experienced standalone companies, inexperienced-experienced syndication companies, inexperienced syndication companies, and experienced syndication companies.

Now, we investigate the relationship between capital inflows and the likelihood of a company becoming a standalone (non-syndicated) company, given the expertise of its backing funds. We employ a multinomial logit model to analyze the impact of capital inflows on syndication. We run two regressions, one on the companies backed by inexperienced funds and the other on the companies backed by experienced funds. For the

companies backed by inexperienced (experienced) funds, we measure the company's probability of being backed by one VC (the base outcome), relative to its probability of being backed by a syndication of inexperienced-experienced funds (the second outcome), and relative to its probability of being backed by syndication of inexperienced (experienced) funds (the third outcome).

Column (1) of Table 8 measures the probability of a company being backed by a syndication of inexperienced funds relative to the base outcome of being backed by a single inexperienced fund in the first financing round. Column (2) of Table 8 measures the probability of a company being backed by a syndication of inexperienced-experienced funds relative to the base outcome of being backed by a single inexperienced fund in the first financing round.

The main variable of interest is capital inflows. Column (1) of Table 8 indicates insignificant relations between the capital inflows and the company's probability of being backed by a syndication of inexperienced funds relative to its being a standalone company backed by an inexperienced fund. Column (2) of Table 8 indicates highly significant negative relations between the probability of a company being backed a syndication of inexperienced-experienced funds relative to the probability of its being a company backed by a single inexperienced fund. An increase of \$1 billion in the capital inflow is associated with a decrease of 7.9% in the company's probability of being backed by an inexperienced-experienced syndication relative to being backed by a single inexperienced fund.

Column (2) of Table 8 shows that the financing round size has a positive and highly significantly effect on the company's probability of being backed by an inexperienced-experienced syndication relative to the base outcome. Since inexperienced funds are smaller, on average, than experienced funds (Table 1), this finding suggests that the deal size might play a role in the syndication decision, when one of the syndication partners is an inexperienced fund. An increase of 1 standard deviation of the first financing round

size (\$8.5 million) is associated with an increase of 21.5% in the company's probability of being backed by an inexperienced-experienced syndication relative to the base outcome.

Column (3) of Table 8 measures the probability of a company being backed by an inexperienced-experienced syndication relative to the base outcome of being backed by a single experienced fund in the first financing round, and indicates on insignificant relations between the capital inflows and the company's probability of being backed by a syndication of inexperienced-experienced funds relative to its being a standalone company backed by an experienced fund.

Column (4) of Table 8 measures the probability of a company being backed by an experienced-experienced syndication relative to the base outcome of being backed by a single experienced fund in the first financing round. We find the coefficient on the variable capital inflows is negative and highly significant. The economic impact of capital inflows on the company's probability of being syndicated is the strongest for the experienced-experienced syndication; an increase of \$1 billion of the capital inflow is associated with a decrease of 12.9% in the company's probability of being backed by an experienced-experienced syndication relative to being backed by a single experienced fund.

One concern that we have to address is the relation of the industry performance (and capital inflows) with the funds' risk preference. In strong performance periods funds might increase their investments in very early companies, while in poor performance periods, they might focus on mature companies which are less risky. To deal with this issue, we add as an independent variable the VC risk preference, which measures the ratio of new early-stage companies backed by VCs to the total number of new companies backed by VCs in a given year. The annual rate of new companies that receive VC funding in their early financing rounds is 64.7% (the other companies receive their first VC funding in later financing rounds). Table 8 shows that the coefficient on this variable is insignificant, which indicates that the results are not affected by changes in the funds' risk preference.

The main finding of this section is that conditional on receiving VC funding, capital inflows have a negative and highly significant impact on the company’s probability of being backed by a syndication of funds that includes experienced funds. This in turn is expected to have a negative impact on the probability of success of the most promising companies, which, all else being equal, are more likely to be backed by a syndicate of experienced funds.

## 4.2 Robustness Check II: Competition vs. Financial Constraints

In hot periods, both more funds enter the market, and the average size of the experienced funds that enter the market is bigger (Table 1). We argue that in hot periods, the increasing competition between funds has a negative impact on the fund’s reciprocity motivation to originate syndication. Nevertheless, the bigger size of experienced funds established in hot periods, might lead to less syndicated deals as well, as those funds are less capital constrained. Lockett and Wright (2001) show in a survey on UK VC funds that traditional finance motivations for syndication such as the deal size in proportion to the size of the fund are the most important factor in the fund’s decision to syndicate a deal. Hence, an alternative explanation for the negative relationship between capital flows and syndication is that funds are less capital constrained in hot periods. In other words, we might confuse between the financial motivation and the reciprocity motivation as the factors that lead to the negative impact of capital inflows on syndication.

To deal with this issue, we define the variable “experienced entrants” which is the number of new experienced funds that entered the market in the current investment years. This variable is a proxy for the degree of competition of the funds. We define as well the variable “financial constraint” which is the ratio of the fund size (in \$ million) in proportion to the portfolio size, in terms of number of investee companies. The data show that on average, a fund invests in 17.7 companies (portfolio companies). The

**Table 8**  
**Which Syndication Type is Affected by Capital Inflow?**

Table (8) reports the multinomial logit regressions for first financing round syndication types. The unit of observation is a particular VC-backed company. Variables are defined in appendix, Table (A1). Columns (1) and (2) report results for companies backed by at least one inexperienced fund, and Columns (3) and (4) for companies backed by at least one experienced fund. The dependent variable equals one if only one VC fund participated in the company's first financing round (the base outcome); it equal two if the syndication partner is an inexperienced partner (the second outcome); and it equals three if the syndication partner is an experienced fund (the third outcome). The coefficients measure the change relative to the base outcome. The network controls are "invited other VCs" and "invited by other VCs". The robust p-values, cluster-adjusted on lead VC fund, are in brackets below the parameter estimates. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5 and 1 percent level, respectively.

	Inexperienced fund		Experienced fund	
	Inexperienced partner (1)	Experienced partner (2)	Inexperienced partner (3)	Experienced partner (4)
Capital inflows (\$ m)	0.047 (0.309)	-0.553** (0.258)	-0.400 (0.408)	-1.152*** (0.343)
Market performance	0.327 (0.261)	-0.011 (0.224)	0.089 (0.307)	0.274 (0.260)
Angel	0.492 (0.538)	0.302 (0.443)	0.184 (0.483)	0.722 (0.516)
Foreign VC	0.802 (0.580)	0.570 (0.411)	0.270 (0.425)	-0.994* (0.603)
R1 amount (\$ m)	-0.163 (0.111)	0.158*** (0.050)	0.036 (0.078)	0.076 (0.083)
VC risk preference	0.877 (3.490)	-0.944 (2.319)	-3.069 (2.668)	-2.675 (2.674)
Industry	Yes	Yes	Yes	Yes
Network controls	Yes	Yes	Yes	Yes
Constant	-18.873 (2536.164)	-0.032 (1.671)	0.754 (1.825)	2.601 (1.974)
chi <sup>2</sup>		73.708		1271.547
N		258		282

average investment of an experienced fund established in the bubble years in a company is \$6.8 million, higher than the \$5.7 million for an experienced fund established between 1996-1998;2001-2007. This variable is a proxy for the fund's financial constraints.

**Table 9**  
**Robustness Check II: Competition vs. Financial Constraints**

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Table 9 presents OLS estimation of the first financing round syndication size (conditional on receiving a VC funding). A unit of observation is a particular company backed by at least one experienced fund in the first financing round. Variables are defined in appendix, Table (A1). The dependent variable is the syndication size of the first financing round. The network controls are “Invited other VCs” and “Invited by other VCs”. Robust p-values are in brackets below the parameter estimates. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5 and 1 percent level, respectively.

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R1 amount (\$ m)	0.011 (0.015)
Financial constraint	-0.042** (0.019)
Experienced entrants	-0.054*** (0.019)
Market performance	-0.087** (0.037)
Angel	0.152 (0.147)
Foreign	-0.063 (0.088)
Lead VC Sequence	0.024 (0.041)
VC network controls	Yes
Industry dummy	Yes
Round Quarter	Yes
Constant	5.051*** (0.607)
R <sup>2</sup>	0.195
N	300

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Table 9 tests whether the financial motivation or the reciprocity motivation leads to lower syndication in hot periods. We find that both the fund size normalized by the number of portfolio companies, and the number of new experienced funds that entered the market have a highly significant negative impact on the syndication size.

Overall, those findings strengthen our view that reciprocity is a strong motivation for syndication along with financial motivation, and we can rule out the possibility that pure financial motivations explain our findings.

### 4.3 Standalone Companies

We find that the probability of a company being backed by a syndication of experienced funds is negatively correlated to the capital inflows into the VC industry. The reciprocity hypothesis suggests that funds are less motivated to share their most promising companies with other funds in periods of high capital inflows. If indeed a lower reciprocity motivation leads funds not to syndicate strong companies in hot periods, then standalone companies established in hot periods are more likely to succeed than standalone companies established in cold periods.

In Columns (1) and (2) of Table 9 we investigate the relations between capital inflows and the company's probability of success. Column (1) finds an insignificant relationship between the company's probability of success and capital inflows into the VC industry in the first financing round year. The coefficient on market performance is negative and marginally significant, indicating a lower probability of success for companies established in high performance periods.

In Column (2) of Table 9, we test whether the relationship between capital inflows and the company's probability of success is linear. To do this, we include a squared term of the capital inflows. The relationship between capital inflows and the company's probability of success appears to be positive but concave. The coefficients on the capital inflows are positive and significant and the coefficients on the squared term of the capital inflows are negative and significant. Holding all the estimators fixed at their mean points indicates that the company's probability of success increases up to an annual capital inflows of \$1.35 billion, and decreases thereafter. An increase of the annual capital inflows from \$2 billion to \$3 billion is associated with a decrease in the company's probability of success from 16.6% to 6.9%. The variable "bubble" is a dummy indicator equal to one if the companies were established in the years 1999-2000. We find that the probability of a successful exit is slightly higher in the bubble period, though the difference is statistically

insignificant.

In columns (3)-(4) we focus on standalone companies, and distinguish between those standalone companies by the expertise of their backing fund (inexperienced or experienced). We argue that capital inflows to venture funds reduce the funds' reciprocity motivation to share their promising companies. Hence, the reciprocity hypothesis suggests that capital inflows should be positively correlated with the success of standalone companies backed only by experienced funds. Those companies are less likely to be syndicated due to the lower reciprocity motivation of their backing fund, and not due to their prospects. We do not expect to find that capital inflows to venture funds are positively correlated with the success of standalone companies backed by inexperienced funds, since those funds are less likely to back the most promising companies, and are less likely to reciprocate.

Columns (3) and (4) of Table 10 reports on standalone companies backed by inexperienced funds and experienced funds, respectively. Column (3) does not indicate on significant relationship between capital inflows and the success of companies backed by inexperienced funds. However, Column (4) shows that the relationship between capital inflows and the probability of success of standalone companies backed by experienced funds is positive and concave. Moreover the variable "bubble" is positive and significant, i.e., standalone companies backed by experienced funds that were established in the bubble era are more likely to have a successful exit than standalone companies backed by an experienced fund that were established in other periods. Those findings support the reciprocity hypothesis.



**Table 10**  
**Capital Inflows and the Company’s Probability of Success**

This table presents logit estimates for a regression of the company’s probability of success. The unit of observation is a particular company that is backed by a single VC in its first round. Variables are defined in appendix, Table (A1). The dependent variable is a successful exit, a dummy equal to one if the company was sold to the public through an IPO, or was acquired by another company with a deal value to total capital invested ratio of at least three, and zero otherwise. Columns (1) and (2) report results for all companies. Columns (3) and (4) report results for standalone companies backed by inexperienced funds and experienced funds, respectively. Company controls includes: “R1 syndication size”, “angel”, “foreign VC” , and “R1 amount (\$ m)”. VC controls include: “lead VC sequence”, “lead VC portfolio size”, and “lead VC capital”. Market controls include: “market performance”, and “VC risk preference”. The network controls are “invited other VCs”, and “invited by other VCs”. Robust p-values, cluster-adjusted on VC fund, are in brackets below the parameter estimates. \*, \*\*, and \*\*\* denote statistical significance at the 10, 5 and 1 percent level, respectively.

	All companies		Standalone companies	
	(1)	(2)	Backed by inexperienced funds	Backed by experienced funds
	(3)	(4)	(3)	(4)
Capital inflows (\$ m)	-0.000 (0.000)	0.001* (0.001)	0.001 (0.001)	0.004* (0.002)
Capital inflows <sup>2</sup> (\$ m)		-0.000** (0.000)	-0.000 (0.000)	-0.000** (0.000)
Bubble	0.699 (0.569)	0.795 (0.510)	1.055 (0.936)	2.017* (1.099)
Company controls	Yes	Yes	Yes	Yes
VC controls	Yes	Yes	Yes	Yes
Market controls	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes
VC network controls	Yes	Yes	Yes	Yes
Constant	-0.729 (1.609)	-0.650 (1.575)	-2.822*** (1.085)	-4.258* (2.412)
chi <sup>2</sup>	33.78	33.32	12.581	66.900
N	498	498	169	198

## 5 Summary and Implications

There are many motivations for the syndication of venture capital investments. In this essay, we empirically examine whether reciprocity is a motivation to originate syndication. Using a data set of all the Israeli VCs established in the period 1996-2007, we find that funds invite other funds to invest in their promising companies, and that this invitation has a positive impact on the number of co-investments (syndications) in different companies between the inviting and the invited funds.

We also find that high capital inflows have a negative impact on syndication between

experienced funds. Those funds are more likely to screen the most promising companies and to reciprocate an invitation to syndicate. Since funds compete to finance a limited number of promising companies, the entry of many funds into the industry reduces the probability of each fund screening one of those promising companies. Hence, conditional on screening promising company, funds have less of motivation to share them with other funds. We argue that in periods of high competition between funds, experienced funds syndicate less investments due to a lower motivation to reciprocate.

These results help deepen our understanding of market entry and fund performance procyclicality. The “money chasing deals” hypothesis suggests that in high capital inflow periods, more funds enter the market and compete to back a limited number of promising companies. This, in turn, reduces the probability of funds getting a “seat at the table” in the promising deals. This crowding out effect is translated into poor performance of the VC industry, and in particular of inexperienced funds that enter the market in hot periods.

This essay points to another channel where competition between funds affects the fund’s performance. Promising companies are more likely to be syndicate by experienced funds due to the reciprocity motivation. However, increasing competition has a negative impact on a fund’s motivation to share the most promising companies with other funds. Hence strong companies established in hot periods, are less likely to be funded by a syndication of experienced funds. Since early financing rounds syndication has a positive impact on the company’s probability of making a successful exit, we point to a negative impact of the competition between funds on the probability of success of the promising companies, which is translated to the experienced fund’s performance.

One implication of this essay’s results relates to the entrepreneur’s decision on when to enter the market. In hot periods, entrepreneurs find it easier to receive funding. However strong entrepreneurs, who are more likely to be funded in cold and hot periods, are less

likely to be backed by a syndicate of experienced funds in hot periods. This aspect should be considered in their decision on when to enter the market.

# Appendices

**Table A1**  
**Description of Variables**

Notes: Definitions of the main variables used throughout the text, in chronological order.

<b>Variable</b>	<b>Description</b>
Reciprocity	An indicator equal to 1 if the company's first VC financing, in the first or the second financing rounds, is from a single VC, and from a syndicate of funds (including the first VC) in the subsequent financing round.
Angel	An indicator equal to 1 if an angel participated in the company's first reported financing round.
Foreign VC	An indicator equal to 1 if a foreign VC participated in the company's first reported financing round.
Lead VC sequence	A proxy for the fund's experience. A first-time fund is the first fund raised by a VC company; it is assigned fund sequence number 1. Subsequent follow-on funds are numbered accordingly.
Lead VC portfolio size	The total number of portfolio companies invested in by a particular VC fund.
Lead VC capital	The total capital raised in the current fund (\$ m).
Round amount	The total capital raised in a particular financing round (\$ m).
Market performance	The annual return of 1,494 US venture capital funds, reported by Cambridge Associates LLC.
Industry	An indicator equal to one if the company industry is: CleanTech, Communication & Internet, IT & Software, Life Science, Miscellaneous, or Semiconductor.
Year	An indicator equal to one in the first round of the financing year.
No. of successful exits	The number of successful exits backed by a pair of funds excluding the syndicated companies.
Mutual activity period	The number of overlapping quarters for which the pair of funds are still investing in new companies.
R1 (R2) syndication	The number of different funds participating in the first (second) financing round.
Invited by other VCs	The ratio of the number of individual VCs that invested in the fund's portfolio companies in preceding rounds (capping after the third round) normalized by to the number of active VCs in a given quarter.
Continued on next page	

**Table A1 – continued from previous page**

<b>Variable</b>	<b>Description</b>
Invited other VCs	The ratio of the number of individual VCs that invested in the fund's portfolio companies in preceding rounds (capping after the third round) normalized by to the number of active VCs in a given quarter.
Capital Inflows	The total committed capital for funds that entered the VC industry in a given year.
VC risk preference	The ratio of new companies that receive their first VC funding in early financing rounds (the first or the second) normalized by the number of new companies that received VC funding in a given year.
Bubble	An indicator equal to one if a company was established in the years 1999-2000.
Financial constraint	The fund size (in \$ m) in proportion to the portfolio size, in terms of number of investee companies
Experienced entrants	The number of experienced funds that entered the market in a given year.
Round Q	The first round of financing quarter.

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