Non-market Strategy in Venture Capital: Private Venture Capital Lobbying Against Entry by Government Sponsored Funds

by

Edward J. Egan

Course: This paper is submitted to fulfill the requirements of PHDBA279C (Dal Bo & de Figuieredo)

Current version: 29rd December 2009 – Still Very, Very Preliminary and Incomplete

Keywords: Venture Capital, Government Policy, Non-market Strategy, Lobbying, Firm Entry

Corresponding author: Edward J. Egan, PhD student, Haas School of Business, University of California at Berkeley, 2220 Piedmont Av., Berkeley, CA, 94720
Email: ed@edegan.com; Tel: 510 275-4535; Student #: 20555020

Abstract:
Government sponsored venture capital funds (GVCs) can use their subsidies to offer better terms to entrepreneurs than their private counterparts. Without constraints on their investment activities, and for the more part GVCs are not constrained in the US market, GVCs can take projects that would have been funded by private venture capitalists (PVCs), reducing the return to PVCs and their investors. PVCs do not have market response to this entrance into their market, but they do have a non-market one. We present evidence from data on contributions to state level politician in the US between 1990 and 2003 that suggests that when times are hard for PVCs, that is when the future exit value of the companies they are financing is low and when they are reducing the amount and dollar value of investment that they make, they turn increasingly to non-market strategies. Furthermore, we find a positive correlation between PVC contributions to the campaign funds of state-level politician and the amount of GVC that is being raised, and a negative correlation between the contributions and the returns PVC will make. We suggest that these results are consistent with a two-principal single-agent model of lobbing, as in Baron (2001).

Introduction:

In this paper we examine whether private venture capitalists use non-market strategies to prevent or limit entry into their markets by government sponsored venture capitalists. In the US government sponsored venture capitalists (GVCs) may raise a part, or all, of their funds from state-level governments. GVCs are effectively subsidized by the government and so have a lower returns requirement than their private counterparts. Ceteris paribus GVCs can offer better terms to entrepreneurs and, without constraints on their investment activities, could 'crowd-out' private venture capitalists (PVCs), reducing the PVCs' returns. PVCs have no market response to this: PVCs compete with one another to raise funds from national and international institutional investors, who also have access to other competing asset classes, and so must make high returns to raise subsequent funds and stay in the market. However, PVCs do have a non-market strategy available to them: They can make contributions to the campaign funds of state government politicians with the expectation that these politicians will, in turn, refuse or limit financing to GVCs (or place constraints on the investments that GVCs can make), effectively reducing the competition from GVCs in their markets.

Crowding out of PVCs by GVCs has not been documented in the US, but there is extensive evidence of this from other markets, particularly Canada, the UK and Israel. In Canada, for example, more than half of all funds are now GVCs, and almost 75% of the venture capital invested in Canadian companies is subsidized by the Canadian Government. Twenty years ago less than 5% of the Canadian venture capital dollars had some form of government subsidy. While there are a number of factors that have lead to this dramatic change in the market's composition, the literature has identified the reduced return requirement together with competition for investment as the primary cause. This crowding out effect is somewhat analogous to Gresham's law that bad money drive out good. In 2009, GVC accounted for about 5% of the VC dollars in the US market.

There are economically valid reasons why the US government might choose to subsidize the venture capital industry. Private venture capitalists will invest until the private marginal benefit from their investment equals their marginal cost of capital including their required return to their institutional investment. The US economy could benefit from GVCs investing on the extensive margin, that is below the private marginal benefit of PVCs, if the social marginal benefit exceeded the cost. For example, suppose that a firm invented a low-cost malaria drug. Such a firm might offer only a low private return on investment, but the social benefits might easily outweigh the cost of investment. The problem, of course, is that of constraining the GVCs to investment on the extensive margin. GVCs, like PVCs, are more likely to raise subsequent funds, and will make more money for their fund managers, if they invest in projects that yield high returns. In jurisdictions outside of the US, this is partly achieved by requiring GVCs to invest a certain portion of their capital into certain types of company, such as companies in certain industries that are outside of the purview of traditional venture capital, or companies owned and operated by minorities, and so forth.

Government sponsored venture capital takes three main forms in the US. The dominant form is the federally operated Small Business Investment Corporation (SBIC) program. The SBIC program offers matched funds to qualifying VC funds. Funds that use the SBIC program may raise the rest of their monies from a wide variety of sources, though many raise money from state governments. Purely state government VC funds that are privately managed do also exist, as do state owned and operated regional development funds. However, in our data all bar two GVC contributions came from SBICs. As only regional development funds have constraints placed on their investment (that we are aware of – it is possible that some government funded VCs also have some constraints placed on them, but we claim that SBICs do not), it is our maintained hypothesis that GVCs will compete with PVCs for returns, and so we hypothesize that PVCs will engage in a non-market strategy response.

It should be noted that PVCs might make contributions with other political goals in mind. In particular, PVCs might want to reduce their state tax rates, or prevent a change in tax policy that would allow carried interest to be recognized as income rather than capital gains. In an attempt to preclude these alternative hypotheses, we first establish that non-market strategies are undertaken, and we then test whether PVC contributions increase when GVC funds enter the market as well as whether they increase as the surplus PVCs gain from transacting in the market decreases. We do find evidence that is consistent with the above story. However, we admit that many other explanations might also account for these patterns in the data; we propose a more careful examination if this basic result is met with any kind of interest (including extreme skepticism).

Endogeneity Issues:

In this early version of this paper we do not attempt to address any of the many endogeneity issues, but we briefly discuss them here. We observe the venture capital market as it has been realized in the data, without the counterfactual of how it would have been without the introduction of GVC. To test the hypothesis that PVCs engage in non-market action we seek to falsify the null hypothesis that PVCs are contributing because they get consumption value from doing so. The test involves a regression of measures of VC wealth against contributions made, and we take a significant negative correlation as a rejection of the null. However, VC wealth is as observed in the industry, and this includes GVCs. Venture capital investment is typically performed with a syndicate of partners, across a number of rounds. Syndicates consist of an average of about 4 venture capital funds, and portfolio companies typically receive about 3 rounds of investment, often from (wholly or in part) different syndicates. GVCs are typically included in these syndicates. In fact, as GVCs are usually small, they are often unable to invest outside of syndicates, and PVC/GVC mixed investment is the norm. As a result our VC wealth measures are reflective of not just PVC wealth but also the market structure, which hinges on the nature of GVC and PVC interactions.

This problem is starkly clear in our returns measures. Actual returns to PVCs are not available to us; they are a closely guarded secret in the industry. However, even if actual returns were available the problem would persist. Our returns are calculated as the PVC fraction of investment multiplied by the exit value. GVC investment appears directly in the denominator of the fraction as well as indirectly in the PVC investment amount and in the exit values. We are essentially unable, without a good instrument that exogenously shifted either the amount of GVC in the market or the amount of PVC in the market, to tell what these returns would have been without GVCs being present, or, more importantly, what the effect of another dollar of GVC entering the market would do to these returns.

On a different front, in this paper we propose testing a two-principal single-agent model of the type described by Baron (2001). The details of this model are below. However, we here not that the model assumes that the preferences of the agent, the politician in our application, are exogenously given. This assumption seems unrealistic to us, and much of our results discussion will assume that instead is correlated with the state of the world. However, the state of the world also influences venture capital activity, and so we note that we have made the preferences of the politician endogenous without (in this version of the paper at least) worrying about how this affects the predictions of the model.

Literature Review:

To the best of our knowledge the literature that empirically examines outcomes of policy in response to contributions to politicians is limited to a sole paper: de Figuieredo & Edward (2007). As de Figuieredo & Edwards (2007) note, previous empirical work in this literature has analyzed the effect on votes, and found mixed results. We are interested in the flow of funds to government sponsored venture capitalists; whether these funds flow as a result of a bill or of discretionary spending by state governments, their flow is commanded directly by the politicians who receive contributions. Thus, we believe that our paper, while following in the vein of de Figuieredo & Edwards (2007), is a more direct test of theory – in de Figuieredo & Edwards (2007) contributions are made to politicians but decisions are made by regulators who are influenced by politicians.

Baron (1996) proposed that firms may engage in non-market strategies, specifically noting that firms may deal effectively with government to secure components of their rent chain that are exposed to competitive forces in the market place. In our instance, one non-market strategy for private venture capitalists might be to lobby government, and/or give contributions to campaign funds for politicians, in order to prevent or reduce entry by government sponsored venture capitalists, who would erode their rents, in the market. Baron (2001) provides details of a multiple principal – single agent model of such activity. This model is based in on that of Grossman and Helpman (1994), and originated with Bernheim and Whinston (1986). The essence of the model is that the politician (the agent) maximizes the joint surplus of all parties but has the bargaining power. Thus the outcome is a function of the politicians policy

preferences, the policy preferences from the two, assumed opposing, interests (the principals), and their contribution schedules. The model can be extended to consider 'entry', that is whether one or both of the principals will undertake lobbying in each round, in which case it takes on the characteristics of a prisoner's dilemma.

Baron (2001) also notes that all pay auctions, Colonel Blotto games and the sequential move, point offer type games of Banks (1999) and Groseclose & Snyder (1996), and other games, may all serve as underlying models. We propose to test the Grossman and Helpman (1994) model, and we therefore now draw attention to differences between this and other models, as well as one potential shortcoming. First, the Grossman and Helpman (1994) model predicts concurrent participation – we should not expect to see occurrences of PVCs contributing when GVCs do not, at least not when both parties are lobbying with respect to our particularly non-market strategy of focus. Second, we should expect to see policy outcomes that are a compromise between the preferences of both PVCs and GVCs – neither fund type should gain their preferences outright. Third, and most importantly, the model assumes that politicians have their own preferences and that these preferences are exogenously given. Crucial to our analysis is that preferences do not vary in a way that is correlated with VC activity.

Ansolabehere, de Figueiredo and Snyder (2003) suggest that contributions may be made for their consumption value; we use this as a null hypothesis and suggest that prima facie evidence of contributions representing evidence of non-market strategy would be that contributions do not systematically rise and fall with the wealth of contributors. Should the data show evidence of engagement in non-market strategies, then we expect that the Tullock (1972) puzzle, that contributions will be very small with respect to the potential benefits from policy, will be apparent.

The literature on venture capital policy in the US is extremely sparse. Egan (2009) provides a comparison of the innovation generation of US PVCs and GVCs, finding that US GVCs do contribute to innovation, but significantly and meaningfully less so than their private counterparts. Lerner (2002) contains an excellent analysis of 'best practices' for the design of public venture capital programs, though it is not specifically targeted at developed VC markets like the US. Lerner (1999) studied the Small Business Investment Research (SBIR) program, a companion program to the SBIC program, and showed that SBIR-backed firms grew faster, produced more innovation and were more likely to attract venture capital than a control group of comparable firms. Gans and Stern (2000) also studied the SBIR program, and provided positive findings. However, to the best of our knowledge, there are no published works directly addressing the performance of the SBIC program, or other U.S. government sponsored venture capital funds, and thus it remains a maintained hypothesis of this paper that there is competition for investment and so returns between PVCs and GVCs.

Outside of the US, the role and performance of government sponsored venture capital funds have received substantial attention. In Canada, for example, Cumming and MacIntosh (2006), Ayayi (2002), and Leleux and Surlemont (2003) provide evidence of low, or even negative, returns on investment by GVCs, as well as of "crowding out" of their private counterparts. Brander, Egan and Hellmann (2008) go further and provide initial results that suggest that GVCs in Canada both may fail to mitigate information asymmetries and also may fail to produce any innovation or innovation externalities. Boyns, Cox, Spires and Hughes (2003) provide similar results for the U.K. From an institutional design perspective, Sandler (2004) provides extensive details of government-sponsored venture capital programs in both Canada and the U.S. We recommend this reference as a first source for understanding how GVC programs are structured and operate, and provide comparatively little of this detail ourselves as it is already well documented here. Cumming and MacIntosh (2006) and Wallsten (2000) comment on the differences in skill sets between GVCs and PVCs.

Brander and Egan (2008) provide evidence to support the notion that venture capitalists are highly specialized financial intermediaries, whose core specialization lies in their ability to mitigate information asymmetries inherent in nascent high-technology ventures, and so to selct and then monitor successful firms. The build directly on the view of venture capitalists that was started with Sahlman (1990) and Amit, Glosten, and Muller (1990). Gompers and Lerner (1996, 1998a, 1998b and 1999) provide the seminal literature on private venture capital. There is considerable evidence that venture capital is a heterogeneous good – that venture capital does not consist of just investment, but instead is a bundle of investment and management services, with variations in the quality of management services from VC to VC. Evidence of the importance of the 'value-added' services of VCs is available in Hellmann and Puri (2002), and others. Furthermore Hsu (2004) provides strong evidence of sorting among VCs and entrepreneurs, adjusting for price. Thus even with a lowered return requirement cone could appeal to quality sorting arguments to justify the position of GVCs on the extensive margin. Likewise, Brander, Amit and Antweiler (2002) provide evidence that venture capitalists syndicate to include the right mix of value-added skills to their firms. One can assume that VCs are able to measure each other's ability and so will construct syndicates that maximize returns to the lead VC by optimizing skill complements in conjunction with the cost of capital.

Data and Descriptive Statistics:

Data[1] on political contributions was retrieved from FollowTheMoney.org, through their web based API. Data was retrieved for all contributions to all politicians included in the dataset, which covers 1990-2009 and 41 states, and then matched on the basis of contributor's name and business name to a list of all venture capital funds and management firms that were in operation from 1980 to 2009. We considered only contributions to candidates that one and so could directly affect policy. The data from FollowTheMoney.org appears incomplete; there is a

[1] We treat the word data as singular mass entity, rather than the plural of datum.

noticeable lack of data in the early years (1990-1997) that may be attributable to either incomplete coverage or a lack of legal requirements in some states to disclose contributions, or both. However, we do not have any reason to believe that the data introduces any systematic biases for our purposes.

Venture capital fund data was taken from Thomson VentureXpert's Fund dataset, available through SDC Platinum. Likewise, data on venture capital portfolio companies was taken from Thomson VentureXpert's Portfolio Company dataset. Both datasets have been extensively used and studied by academics, such as Lerner et al. (2001), and are considered to be near comprehensive. Funds self-report their type, from which we classified funds as private venture capital (PVC), government sponsored venture capital (GVC) or other. Funds reporting themselves as state government owned, business/community/regional development programs, or Small Business Investment Corporations (SBICs) where classified as GVC. In practice, however, state government owned funds made no contributions and the development programs only made only two contributions in the period. Our sample is therefore essentially entirely SBIC contributions. Investments classified as 'Other' VC included those from Angels, individuals, university start-up funds, secondary purchase funds, and self-identified 'other' funds. All other funds were classified as PVCs. Attention was restricted to funds that made investments classified as venture capital by PWC Moneytree, which excludes pre-VC Angel investment and mezzanine financings as well as leveraged buy-outs, funds that were domiciled in the US and invested into US headquartered portfolio companies, and funds that were raised or made their first investment in the extended sample period of 1990 to 2009.

Venture capital exits are made up of both acquisitions and initial public offerings. Data on acquisitions was taken from the SDC M&A database and data on IPOs was taken from the Global New Issues (GNI) dataset on IPOs of US firms. Attention was restricted to the first acquisition that took place while the target was private and subsequent to receiving venture capital, and to initial public offering of common stock (i.e. excluding secondary offerings, rights and warrants issues, and so forth), to ensure that these represented actual exit events. Exits were identified and joined to data on venture capital portfolio companies using name based matching. Details of this process, and the handling of VC exit data generally, is covered in Brander, Egan, and Hellmann (2005). The mean time to exit from first investment is approximately 5 years, though the vast majority of portfolio companies exit within 6 years. To allow sufficient time to exit, all samples using exit data are restricted to the period 1990 to 2003. Furthermore, as we are not able to ensure that correlations found during this period hold over the full extended period, we restrict attention to the 1990 to 2003 period for all regressions.

Data on real GDP, in year 2000 millions of dollars, was taken from the Bureau of Economic Analysis (BEA), and data on the composition of state senates and houses was taken from the Interuniversity Consortium for Political and Social Research (ICPSR). Data was aggregated to the state-year level, and on state years that have contributions from either or both types of VC were included. This is inline with the expectations of the Baron (2001) model which predicts that

firms must contribute to enact non-market strategies. An alternative dataset of all of the state years from 1990 to 2009 was also constructed and tested. The results were broadly similar, with a more significant effect for PVC contributions and a less significant effect for GVC contributions. Contributions appear to cluster heavily around election dates, and so in the dataset that we use most states have data for only every other year (i.e. the even years). This pattern is evident in table 1 below. As a result there are just 93 observations in the dataset, which means, among other things, that we will have low statistical power.

Table 1: PVC and GVC Contributions by Year

	PVC+GVC Contributions		**PVC Contributions**		**GVC Contributions**	
Year	**($)**	**(#)**	**($)**	**(#)**	**($)**	**(#)**
1990	4260	8	4260	8	0	0
1992	3400	5	3400	5	0	0
1994	16284	26	16284	26	0	0
1996	15380	38	15380	38	0	0
1997	8925	5	8925	5	0	0
1998	292625	695	291065	690	1560	5
1999	11825	28	11825	28	0	0
2000	279408	467	263908	463	15500	4
2001	382025	187	381025	186	1000	1
2002	3037644	2245	3024712	2226	12932	19
2003	898650	316	892650	311	6000	5
Total	*4950426*	*4020*	*4913434*	*3986*	*36992*	*34*

In the FollowTheMoney.org data in the 1990 to 2003 period, there are just 4020 contributions from PVCs and GVCs, of which GVCs contributed just 34 (less that 1%). The total value of contributions by PVCs and GVCs is less than $5m, which is an average of around $350k a year. To put this in perspective, we retrieved data on over 6 million contributions for the 1990-2003, the US economy has a GDP of about $14trillion a year, and the venture capital industry invests about $30billion per year. Thus if venture capitalists invested in proportion to their contribution to GDP we would expect about ($30b/$14t * 6m) 13,000 contributions. Furthermore, as was reported in Egan (2009), GVCs account for about 5% of the US venture capital industry.

Table 2 presents some basic descriptive statistics over the 1990-2003 period for the contribution variables, the control variables, and for our independent (VC outcome related) variables. There are PVC contributions in all of the observations, but (non-zero) GVC contributions for just 10 observations. PVC contributions are an order of magnitude bigger and more frequent than GVC contributions. Democrats held more than 50% of the seats in each state-year's House and Senate more than half the time (54% of observations for the House, and 52% for the Senate). However, they held control of both the House and the Senate for about 40% of the observations. The House

and Senate were split, that is neither Republicans nor Democrats held greater than half of the seats, for 3% and 6% of the observations respectively.

The majority of the VC related variables are self explanatory; for example the total amount of VC investment in a state-year is exactly that, though we distinguish between all VC which includes VC classified as type "Other", and PVC and GVC. The total amount of GVC plus PVC investment is a separate variable. However, some variables require special attention. The funds raised, by type, in each state-year is included, as is the number of new funds raised. The total funds raised includes both new and follow-on funds. The capital under management (CUM), by type, is calculated in two ways. First, according to the industry standard practice we allocate funds equally over a five year period beginning in the year that the fund is raised. Typically funds are raised with a ten year lifespan, with the first five years allotted to investment and subsequent year spent waiting for an exit. Second, we allocate funds linearly over the investment life of the fund, defined as the time between the funds first and last investment. This is a more reasonable measure, as some funds place all of their monies in the first year and others are 'ever-green' funds which may make investments over a twenty year period.

The PVC return measures, which are our measure of surplus for the PVCs, are constructed by summing returns either by the fund's state of headquarters and year of fund raising to create state-year totals, or by the company's state of headquarters and year of its first round of VC investment. In both cases the return is calculated as follows:

$$PVC\ Return = \frac{\$PVC}{\$PVC + \$GVC\ + \$Other} \times \$ExitValue$$

The distinction between summing at the fund's state and year or the company's state and year may be important. If all funds invested solely in their own states, the distinct would simply be one of timing, but most funds invest a large proportion of their monies out of state. We calculate this return with the denominator either as stated or with $Other set to zero, so that the return represents the surplus being fought over by PVCs and GVCs.

There are a three important features to be noted from table 2: The size of contributions is very small relative to the size of investments and returns: GVC contributions, fund raising and investment are all small relative to their PVC counterparts; and PVC returns make up the majority of exit values. Contributions in a state year are about $50,000 from PVCs, and on average $400 from GVC. When GVCs do contribution their mean contribution is under $4,000. This stands in stark comparison to the $680m invested each state-year by PVCs and $18m invested by GVCs.GVC funds are small by venture capital industry standards, and not all state-years see the raising of GVC fund, whether new or follow-on. The finding that on average each state-year sees $8m of new GVC fund raising and $35m of new and follow-on GVC fund raising is therefore in line with our expectations. Although these amounts are small they are material, and so do offer a credible threat to the returns of PVCs. PVC returns, depending on how they are

measured range from about $250m to $500m a state-year. However, there is considerable variation in returns from state to state and year to year.

Table 2: Descriptive Statistics – Contribution, Control and Independent Variables

	N	Mean	Std.dev.	Min	Max
Contribution Variables					
GVC Contributions ($k)	93	0.40	2.04	0	15
GVC Contributions ($k>0)	10	3.70	5.37	0.5	15
PVC Contributions ($k)	93	52.83	221.32	0.03	1853.841
PVC Contributions ($k>0)	93	52.83	221.32	0.03	1853.841
Control Variables					
GDP ($b 2000)	93	261.40	278.64	13.417	1406.511
Calif./Mass.	93	0.05	0.23	0	1
Democratic House	93	0.54	0.50	0	1
Democratic Senate	93	0.52	0.50	0	1
Democratic Control	93	0.41	0.49	0	1
Split House	93	0.03	0.18	0	1
Split Senate	93	0.06	0.25	0	1
Independent Variables					
ExitValue ($m)	93	483.40	1261.17	0	7681.509
Exits (#)	93	4.96	13.08	0	113
Total VC Investment ($m)	93	1211.52	3577.48	0	31700
PVC+GVC Investment ($m)	93	652.04	1799.21	0	15700
PVC Investment ($m)	93	633.69	1751.64	0	15200
GVC Investment ($m)	93	18.35	48.87	0	435.6444
New GVC Funds ($m)	93	8.36	26.52	0	150
GVC Funds Raised ($m)	93	35.31	93.37	0	500
GVC CUPM Linear ($m)	93	24.76	48.17	0	256.27
GVC CUPM 5yr ($m)	93	32.64	58.03	0	299.44
New PVC Funds ($m)	93	217.67	784.75	0	6088.5
PVC Funds Raised ($m)	93	1877.80	6462.09	0	43732.6
PVC CUPM Linear ($m)	93	1403.28	3810.42	0	22955.85
PVC CUPM 5yr ($m)	93	1892.96	5000.36	0	25438.8
PVC Fund Return ($m - All Inv)	59	318.50	753.18	0	4472.002
PVC Fund Return ($m PVC+GVC)	93	343.64	1032.14	0	7799.072
PVC Company Return ($m –All Inv)	93	257.07	684.22	0	4248.839
PVC Company Return ($m - PVC+GVC)	93	466.12	1239.78	0	7497.901

Results and Analysis:

As a first step towards testing our hypotheses we demonstrate the importance and validity of our control variables. To this end we use the total VC invested as an independent variable – it will be used later in our examination of when non-market strategy is important and the effects of the control variables on it are representative of their effects on other variables later. Table 3 shows the basic control variables. A priori we feel that state and year fixed effects will be important. Aside from political variation, there is extensive variation in venture capital activity. Two states in particular, California and Massachusetts, dominate the venture capital industry, and the boom years of 1995 to 2000, which is in the middle of our sample, are now essentially synonymous with venture capital.

Table 3: Exploring Basic Control Variables

All specifications use heteroskedastic robust ordinary least squares (with a Huber-White sandwich adjustment). The independent variable is the total VC investment in each state-year observation, and is representative of other independent variables. Calif./Mass. is a binary variable indicating whether the state is either California or Massachusetts.

Total VC Investment ($k)	Coef (t score)	Coef (t score)	Coef (t score)	Coef (t score)	Coef (t score)
PVC Contributions ($)	-5.020 (-1.51)	-7.880 (-3.61***)	-10.429 (-6.68***)	-10.215 (-6.50***)	-10.214 (-6.43***)
GVC Contributions ($)	1777.617 (5.71***)	1427.590 (5.83***)	1008.444 (6.96***)	936.494 (7.63***)	963.738 (6.85***)
Calif./Mass.	-	7129509.000 (3.39***)	-	-	-
GDP ($m 2000)	-	-	-	-	2.840 (0.35)
State Fixed Effects	-	-	yes	yes	Yes
Year Fixed Effects	-	-	no	yes	Yes
Constant	769647.600 (4.89***)	676683.800 (5.00***)	51148.480 (21.84***)	27856.700 (0.09)	-239715.800 (-0.30)
R-squared	0.744131	0.835139	0.936598	0.955456	0.955776
N	93	93	93	93	93

***, **, and * indicate significance at the 0.01, 0.05 and 0.1 levels respectively

The coefficients on PVC contributions and GVC contributions are essentially robust to the inclusion of additional control variables once state fixed effects have been included. Including a dummy variable for California or Massachusetts addresses approximately half of the bias present when state fixed effects are not included. Including GDP, which is actually the state-wise change in GDP once fixed effects have been applied does not change the results and is included from here on only to provide reassurance.

In table 4 we examine the impact of controlling for the political environment. In contrast to de Figueiredo and Edwards (2007) we do not find a significant effect for the political environment; this was to be expected. We are examining the effect on our independent variable(s), not on

contributions directly. However, our coefficients on our contribution variables are very robust to the inclusion of these variables. We choose to include just the "Democratic Control" variable, a binary variable that takes the value one if Democrats held more than 50% of the seats in both the House and the Senate in that state-year and zero otherwise, in all future regressions as our political control variable.

Table 4: Exploring Political Environment Control Variables

All specifications use heteroskedastic robust ordinary least squares (with a Huber-White sandwich adjustment). The independent variable is the total VC investment in each state-year observation, and is representative of other independent variables. Democrat House and Senate are binary variables indicating that Democrats held more than 50% of the House and Senate respectively. Democrat Control is a binary variable indicating that Democrats held more than 50% of the seats in both the House and the Senate. Split House and Senate are binary variables indicating that neither Democrats nor Republicans held more than 50% of the seats in the House and Senate respectively.

Total VC Investment ($k)	Coef (t score)	Coef (t score)	Coef (t score)	Coef (t score)
PVC Contributions ($)	-10.192 (-6.29***)	-10.232 (-6.20***)	-10.221 (-6.03***)	-10.189 (-5.77***)
GVC Contributions ($)	951.673 (6.71***)	948.404 (6.50***)	952.494 (6.41***)	946.079 (6.10***)
GDP ($m 2000)	2.411 (0.31)	2.190 (0.27)	2.708 (0.33)	2.717 (0.32)
Democrat House	-	27575.420 (0.03)	277575.000 (0.21)	645614.200 (0.34)
Democrat Senate	-	-286383.800 (-0.74)	18590.980 (0.03)	-255587.600 (-0.45)
Democrat Control	-341654.400 (-0.84)	-	-465876.600 (-0.45)	-319381.800 (-0.36)
Split House	-	-	-	1020748.000 (0.69)
Split Senate	-	-	-	-747504.000 (-1.46)
State Fixed Effects	yes	Yes	yes	yes
Year Fixed Effects	yes	Yes	yes	yes
Constant	499368.800 (0.57)	336662.100 (0.18)	127843.600 (0.06)	-346181.500 (-0.10)
R-squared	0.956209	0.95605	0.956344	0.957573
N	93	93	93	93

***, **, and * indicate significance at the 0.01, 0.05 and 0.1 levels respectively

Our first hypothesis is that PVCs and GVCs engage in non-market strategy. The consumption hypothesis serves as our default. Under the consumption hypothesis we would expect to see that when VCs are richer they contribute more. If we observe something different in the data then we might consider it evidence of non-market strategies being utilized. For the discussion that follows we generally ignore all of the many endogeneity issues (except those regarding politician's preferences); who the various endogeneity issue might affect the results is discussed separately.

Table 5 shows that PVC contributions are negatively correlated with four indicators of venture capital 'good times', and this correlation is highly statistically significant. The reverse is true for GVC contributions, which show a strong positive correlation.

The negative correlation between PVC contributions and exit value (say) is consistent with the notion that in bad times for VCs there is too little exit value to be shared and so PVCs increase their contributions to politicians to prevent entry by GVCs. The positive correlation between GVCs and exit value is more problematic. The consumption hypothesis is feasible but so is a reasonably plausible non-market strategy story. Suppose that politician's preferences are influenced by market conditions, in particular suppose that when venture capital investments are losing money it does not seem appropriate amplify the loses by facilitating further GVC, especially when this notion is supported by contributions from PVCs. Further suppose that when times are good, there is no amount of contributions from PVCs that could discourage a politician from allowing entry by GVCsbut that there is competition among GVCs to get support. Then, under these suppositions, we would expect to see the pattern that emerges.

Table 5: Engagement in Non-Market Strategy

All specifications use heteroskedastic robust ordinary least squares (with a Huber-White sandwich adjustment). The independent variables are the total exit value of VC backed companies that are headquartered in the state and first funded in the year of interest, the corresponding number of exit events (M&As and IPOs), the total VC invested including all classes of VC, and the total PVC and GVC invested. OLS used as an approximation for the Exits variable; strictly a Poisson or negative binomial regression is more appropriate for count data, but these had MLE convergence issues and the approximation should be valid as the number of zero counts is low.

	Exit Value ($k)	Exits (#)	Total VC Inv ($k)	PVC+GVC Inv. ($k)
	Coef (t score)	Coef (t score)	Coef (t score)	Coef (t score)
PVC Contributions ($)	-2.046 (-4.85***)	-0.000 (-6.18***)	-10.192 (-6.29***)	-5.002 (-6.24***)
GVC Contributions ($)	174.644 (5.22***)	0.004 (8.43***)	951.673 (6.71***)	422.496 (6.00***)
GDP ($m 2000)	0.701 (0.41)	0.000 (0.28)	2.411 (0.31)	2.185 (0.50)
Dem. Control	-235247.200 (-1.07)	-0.650 (-0.55)	-341654.400 (-0.84)	-237822.400 (-1.04)
State Fixed Effects	yes	Yes	yes	Yes
Year Fixed Effects	yes	Yes	yes	Yes
Constant	326344.100 (0.70)	1.963 (0.74)	499368.800 (0.57)	266923.600 (0.52)
R-squared	0.816312	0.952848	0.956209	0.95382
N	93	93	93	93

***, **, and * indicate significance at the 0.01, 0.05 and 0.1 levels respectively

There are two main problems with these suppositions: they fail the test of Occam's Razor; and there is a normative argument for the politicians to behave to the contrary. Normatively, we might expect that in good times all projects with a positive private benefit are funded – money is cheap then – but not all projects with a positive benefit are funded when times are bad,

furthermore we might expect that private and social benefits are on average correlated, so politicians should promote GVC when times are bad, not when they are good.

From table 5 we have some evidence of non-market strategy by PVCs but at best mixed evidence for GVCs. The non-market strategy by PVCs would be supported by a finding that PVC contributions are positively correlated with an increase in GVC funds in the market. For GVC funds both the consumption hypothesis and the non-market strategy hypothesis would suggest that GVC contributions will be positive correlated with an increase in GVC funds.

In table 6 below we find that PVC contributions are not significantly correlated with GVC fund raising in the current year, but they are positive correlated with GVC fundraising in the next year. For new and follow-on fund raising in the next year taken together, the positive correlation fails to achieve statistical significance. However, for just new funds in the next year, the correlation is strongly statistically significant. GVC contributions achieve the full range from no significance to strong significance.

Table 6: Lobbying Regarding the Entrance of GVC Funds

All specifications use heteroskedastic robust ordinary least squares (with a Huber-White sandwich adjustment). The independent variables are the cumulative size (in $m) of new and all GVC funds that were raised in the year of the contributions and in the year following the contributions.

	New GVC fund ($m)	New+Followon GVC Funds ($m)	New GVC fund ($m) - Next year	New+Followon GVC Funds ($m) - Next Year
	Coef (t score)	Coef (t score)	Coef (t score)	Coef (t score)
PVC Contributions ($)	0.000 (-0.55)	-0.000 (-0.99)	0.000 (3.89***)	0.000 (1.54)
GVC Contributions ($)	0.008 (4.90***)	0.020 (2.33**)	0.001 (0.83)	0.008 (1.79*)
GDP ($m 2000)	0.000 (0.14)	0.001 (1.40)	0.000 (0.04)	-0.000 (-0.94)
Democrat Control	10.608 (1.11)	58.959 (1.26)	23.558 (2.16**)	-34.347 (-0.55)
State Fixed Effects	yes	yes	yes	Yes
Year Fixed Effects	yes	yes	yes	Yes
Constant	-21.918 (-0.94)	-185.696 (-1.46)	-42.067 (-1.82*)	119.101 (0.86)
R-squared	0.54869	0.560374	0.724547	0.697086
N	93	93	93	93

***, **, and * indicate significance at the 0.01, 0.05 and 0.1 levels respectively

One story that is consistent with the PVC results is as follows: GVCs like all VCs get better with experience. They might get better by offering more competitive terms, working better with private VCs, and adding complementary value to their portfolio companies. Thus, from the perspective of PVCs it is the new GVC funds that damage them, more so than the follow-on

funds. Furthermore, suppose that it takes time after the contribution is made for the politician to facilitate funding for the GVC – this isn't unreasonable as the politician must get elected and take office. Then we would expect to see a positive correlation between next year's GVC fund raising and this year's PVC contributions, and the correlation would be strongest for new funds.

The results for GVC contributions from table 6 support either the consumption or the non-market strategy hypothesis. In table 7 we find an interesting quirk: the total capital under management by GVCs is negatively correlated with GVC contributions, and this correlation is statistically significant in the next year. This does not support the consumption hypothesis, but equally it doesn't support a non-market strategy hypothesis relating to either GVCs contributing against PVCs or GVCs contributing against competing GVCs. Table 7 does provide further support for engagement in non-market strategies for PVC.

Table 7: Lobbying Regarding the Amount of GVC Participating in the Market

All specifications use heteroskedastic robust ordinary least squares (with a Huber-White sandwich adjustment). The independent variables are the CUM (Capital Under Management) of GVCs participating in the market calculated using either a linear allocation model of funds raised over the number of years between the funds first and last investments, or using the standard five year allocation model, for both the year in which the contributions were made and the following year.

	GVC CUM Linear ($m)	GVC CUM 5yr ($m)	GVC CUM Linear ($m) - Next Year	GVC CUM 5yr ($m) - Next Year
	Coef (t score)	Coef (t score)	Coef (t score)	Coef (t score)
PVC Contributions ($)	0.000 (2.73***)	0.000 (3.91***)	0.000 (5.24***)	0.000 (1.76*)
GVC Contributions ($)	-0.002 (-0.87)	-0.000 (-0.07)	-0.007 (-5.70***)	-0.005 (-2.14**)
GDP ($m 2000)	0.000 (1.73*)	0.000 (0.16)	0.000 (0.53)	-0.000 (-0.80)
Democrat Control	2.626 (0.30)	15.213 (1.37)	-15.159 (-2.22**)	4.547 (0.64)
State Fixed Effects	yes	yes	yes	Yes
Year Fixed Effects	yes	yes	yes	Yes
Constant	-18.390 (-0.77)	-30.777 (-1.05)	25.846 (1.42)	2.740 (0.14)
R-squared	0.948676	0.936819	0.948026	0.928987
N	93	93	93	93

***, **, and * indicate significance at the 0.01, 0.05 and 0.1 levels respectively

In table 8 we examine the influence of contributions on return. Recall that our return measure are made by considering the fraction of exit value attributable to PVCs with respect to either PVC plus GVC investment or all venture capital investment, and that these returns are aggregate back to either the funds state and date of fund formation or to the company's state and date of first investment. Our notionally strongest measure is probably the return calculated against just PVC plus GVC investment and aggregated at the fund level. This measure (shown in column 2 and

used again in table 9) is our closest to representing the future surplus that PVCs and GVCs are potentially competing for in the market place.

If PVCs and GVCs are competing for this surplus using non-market strategies during hard times, as we have constructed this surplus to be close to zero sum (once again ignoring endogeneity issues), we would expect to see PVC contributions negatively correlated with it. Supposing that engagement in non-market strategy for GVCs increases when times are hard too, we would expect a rise in PVC surplus, which is a fall in GVC surplus, to be positive correlated with GVC contributions. This is the result found in table 3, with strong statistical significance for all specifications.

Table 8: Lobbying Regarding the Allocation of Returns to PVCs

All specifications use heteroskedastic robust ordinary least squares (with a Huber-White sandwich adjustment). The independent variables are the PVC share of the exit value calculated against either all VC investment or against just the sum of PVC and GVC investment. This return variable is calculated in two ways: The fund return makes this calculation for using the companies that received investment from each fund, with the result allocated to the fund's state of headquarters and the year that the fund was raised; the company return makes this calculation using all of the funds that invested in a specific company, with the result allocated to the state of the company's headquarters and the year that the company received its first investment.

	PVC Fund Return - All Inv	PVC Fund Return - PVC vs. GVC	PVC Co. Return - All Inv	PVC Co. Return - PVC vs. GVC
	Coef (t score)	Coef (t score)	Coef (t score)	Coef (t score)
PVC Contributions ($)	-1.820 (-4.84***)	-3.251 (-5.99***)	-1.438 (-6.07***)	-2.032 (-4.86***)
GVC Contributions ($)	110.689 (3.37***)	255.379 (5.79***)	61.341 (2.92***)	173.655 (5.31***)
GDP ($m 2000)	-2.079 (-0.74)	-1.757 (-0.85)	0.692 (0.60)	0.603 (0.35)
Democrat Control	-95182.320 (-0.82)	-231079.300 (-1.65)	-88037.590 (-0.59)	-218048.200 (-0.99)
State Fixed Effects	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes
Constant	-732412.600 (-2.16**)	367322.400 (0.88)	108971.400 (0.32)	289337.900 (0.62)
R-squared	0.876706	0.867975	0.814035	0.813067
N	93	93	93	93

***, **, and * indicate significance at the 0.01, 0.05 and 0.1 levels respectively

As a simple extension to our main results we consider the nature of the lobbying. We are not able to answer strategic questions such as "Is it better to contribute big amounts occasionally or small amounts frequently?" or "Should you give to those in power or those in opposition?" However, we are able to observe the correlations that have held in practice, on average, over our sample period. Table 9 column 1 repeats the results for our preferred measure of surplus from table 8 about for comparison.

Table 9: Targeting Lobbying Activity

All specifications use heteroskedastic robust ordinary least squares (with a Huber-White sandwich adjustment). The independent variable is the PVC share of the exit value calculated against the sum of PVC and GVC investment, using the exit value of the companies that received investment from the PVC allocated to the PVCs state of headquarters and the year that the fund was raised. The dependent variables include the PVC and GVC contributions to Democrats, Republicans and the Governor, as well as the contributions to the party that was in control (defined as the party that held more than 50% of the seats in both the House and Senate) and the party 'out-of-control' (defined as any party that held less than 50% of the seats in both the House and the Senate).

PVC Fund Return - PVC vs. GVC	Coef (t score)	Coef (t score)	Coef (t score)	Coef (t score)
PVC Contributions ($)	-3.251 (-5.99***)	-	-	1.234 (2.04**)
PVC Contributions (#)	-	-	-	-5353.803 (-7.89***)
GVC Contributions ($)	255.379 (5.79***)	-	-	522.194 (13.01***)
GVC Contributions (#)	-	-	-	-279288.000 (-5.99***)
PVC Con. to Dem. ($)	-	-3.438 (-3.70***)	-	-
PVC Con. to Rep. ($)	-	-5.827 (-0.83)	-	-
PVC Con. to Governor ($)	-	-2.069 (-0.37)	-	-
GVC Con. to Dem. ($)	-	71.73 (0.22)	-	-
GVC Con. to Rep. ($)	-	-203.944 (-0.56)	-	-
GVC Con. to Governor ($)	-	507.254 (0.91)	-	-
PVC Con. to in-control ($)	-	-	-3.462 (-17.97***)	-
PVC Con. to out-of-control ($)	-	-	-0.983 (-0.60)	-
GVC Con. to in-control ($)	-	-	367.584 (4.27***)	-
GVC Con. to out-of-control ($)	-	-	-257.338 (-1.30)	-
GDP ($m 2000)	-1.757 (-0.85)	-1.433 (-0.58)	-1.282 (-0.61)	-1.865 (-0.93)
Dem. control of both houses	-231079.300 (-1.65)	-188137.700 (-1.28)	-253044.000 (-1.78*)	-238644.000 (-1.71*)
State Fixed Effects	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes
Constant	367322.400 (0.88)	246967.700 (0.53)	348724.900 (0.79)	344039.000 (0.82)
R-squared	0.867975	0.88061	0.892421	0.924507
N	93	93	93	93

***, **, and * indicate significance at the 0.01, 0.05 and 0.1 levels respectively

Column 2 breaks the contributions into those to Democrats, Republicans, and to the Governor. We find that PVC contributions to Democrats appear to be driving their effect on surplus; this is perhaps not surprising as Democrats held control of both the House and Senate more than Republicans in our sample. In Column 3, this story is born out: we find that on PVC and GVC contributions to the party in power, that is the party who hold more than 50% of the seats in both the House and the Senate, have a significant effect. Furthermore the magnitude of the effect of contributions to those in power is directly comparable to the magnitude of the effect of all contributions, if not marginally bigger – suggesting that these are the contributions that are truly effective.

Column 3 considers both the amount and the count of contributions by both VC types. It would appear that PVCs get their influence by contributing small amount very frequently, whereas GVCs get their influence by contributing large amount infrequently, though we would stress that given the magnitude of the coefficients, this explanation needs further examination.

Conclusion:

In this paper we presented evidence that private VCs engage in non-market strategies, specifically that VCs attempt to limit entry by GVCs when times are bad, and so prevent GVCs from adversely affecting their returns. The paper would, no doubt, be improved by a complete rebuild of the dataset followed by a complete rewrite, but it does seem that there is an interesting result here waiting to be properly explored.

References:

Amit, Rafael., James A. Brander, and Christoph Zott (1998). "Why do Venture Capital Firms Exist? Theory and Canadian Evidence," Journal of Business Venturing 13, 441-466.

Amit, Rafael., Lawrence Glosten, and Eilat Muller (1990). "Entrepreneurial Ability, Venture Investments, and Risk Sharing," Management Science 36, 1232-1245.

Ansolabehere, S., J. de Figueiredo and J. Snyder (2003), “Why Is There So Little Money in U.S. Politics?” Journal of Economic Perspectives 17(1): 105-130.

Ayayi, Ayi (2002), "Good News, Bad News: Ten Years’ Lessons from the Canadian Labour-Sponsored Venture Capital Corporations", Faculty of Business Management, Ryerson University, Working Paper, December

Banks, J., 1999, “Buying Minimal Majorities,” Working Paper, California Institute of Technology.

Baron, D. (1996), “The Non-Market Strategy System,” Sloan Management Review 37: 73-85.

Baron, D. (2001), Theories of Strategic Nonmarket Participation : Majority-Rule and Executive Institutions, Journal of Economics and Management Strategy 10, 7-45

Bernheim, D. and M. Whinston (1986), Menu Auctions, Resource Allocation, and Economic

Boyns, N., Cox, M., Spires, R. and Hughes, A. (2003), "Research into the Enterprise Investment Scheme and Venture Capital Trusts", PACEC, Cambridge.

Brander, James A., Rafael Amit, and Werner Antweiler (2002). "Venture capital syndication: improved venture selection versus the value-added hypothesis," Journal of Economics and Management Strategy 11, 423-451.

Brander, James A. and Edward J. Egan (2008), "The Role of Venture Capitalists in Acquisitions", University of British Columbia, Working Paper. Currently under review by the Review of Financial Studies.

Brander, James A., Edward J. Egan and Thomas F. Hellmann (2009), "Government Sponsored Venture Capital in Canada: Effects on Value Creation, Competition and Innovation", presented at the NBER pre-conference on International Differences in Entrepreneurship, Boston, Massachusetts (May), accepted to an NBER special issue on International Differences in Entrepreneurship, forthcoming.

Cumming, Douglas A, and Jeffery G. MacIntosh (2004), “Comparative Venture Capital Governance”, In: V. Kanniainen and C. Keuschnigg, eds., Venture Capital, Entrepreneurship and Public Policy

Cumming, Douglas J. (2006), "The Determinants of Venture Capital Portfolio Size: Empirical Evidence", Journal of Business, Vol.79, pp.1083-1126

de Figueiredo, R. J. P. Jr. and G. Edwards (2007), Does Private Money Buy Public Policy? Campaign Contributions and Regulatory Outcomes in Telecommunications, Journal of Economics and Management Strategy 16, 547-576

Egan, Edward J. (2009), "Promoting Innovation? Government Participation in the U.S. Venture Capital Market", Working Paper, University of California, Berkeley.

Gans, Joshua S. and Scott Stern (2000), "When Does Funding Research by Smaller Firms Bear Fruit?: Evidence from the SBIR Program", NBER Working Papers No. 7877, National Bureau of Economic Research

Gompers, Paul A. and Joshua Lerner (1996), "The Use of Covenants: An Empirical Analysis of Venture Capital Partnership Agreements", Journal of Law & Economics, Vol.39, pp.463-498.

Gompers, Paul A. and Joshua Lerner (1997), "Venture Capital and the Creation of Public Companies: Do Venture Capitalists Really Bring More than Money?", Journal of Private Equity, Vol.1, No.3, pp.15-32.543

Gompers, Paul A. and Joshua Lerner (1998a), "What Drives Venture Capital Fundraising", With Comments by Margaret M. Blair and Thomas Hellmann, Brookings Papers on Economic Activity, Microeconomics, Issue 1998, pp.149-204

Gompers, Paul A. and Joshua Lerner (1998b), "Risk and Reward in Private Equity Investments: The Challenge of Performance Assessment", Journal of Private Equity, Vol.1, Winter, pp.5-12.

Gompers, Paul A. and Joshua Lerner (1999), "An Analysis Of Compensation In The U.S. Venture Capital Partnership", Journal of Financial Economics, Vol.51, pp.3-44

Groseclose, T. and J.M. Snyder, 1996, “Buying Supermajorities,” American Political Science Review, 90 (June), 303–315.

Grossman, G. and E. Helpman (1994), Protection for Sale, American Economic Review 84, Influence, Quarterly Journal of Economics 101(1), 1-32

Hellmann, Thomas, and Manju Puri (2000). "The Interaction between Product Market and Financing Strategy: The Role of Venture Capital," Review of Financial Studies 13(4), 959-984.

Hellmann, Thomas, and Manju (2002). "Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence," Journal of Finance 57, 169-197.

Hsu, David, (2006). "Why do Entrepreneurs Pay for Venture Capital Affiliation," Journal of Finance, 61.

Leleux, Benoit and Bernard Surlemont (2003), "Public Versus Private Venture Capital: Seeding Or Crowding Out? A Pan-European Analysis", Journal of Business Venturing, Vol.18, pp.81-104.

Lerner, Joshua, (1994). "Venture Capitalists and the Decision to go Public," Journal of Financial Economics 35 (1), 293-316.

Lerner, Joshua (1999), "The Government As A Venture Capitalist: The Long-Run Impact of the SBIR Program", The Journal of Business, Vol.72, No.3, Jul, pp.285-318.

Lerner, Joshua (2002), "When Bureaucrats Meet Entrepreneurs: The Design Of Effective 'Public Venture Capital' Programmes", The Economic Journal, Vol.112, February, pp.73-84.

Sahlman, William A. (1990). "The Structure and Governance of the Venture Capital Organizations," Journal of Financial Economics 27, 473-521.

Tullock, Gordon. 1972. "The Purchase of Politicians.", Western Economic Journal. 10, pp. 354-55.

Ueda, Masako & Masayuki Hirukawa (2002), "Venture Capital and Productivity", Conference on Venture Capital Entrepreneurship and Public Policy, CESifo, Munich

Wallsten, Scott J. (2000), "The Effects of Government-Industry R&D Programs on Private R&D: The Case of Small Business Innovation Research Programs" Rand Journal of Economics. Vol. 31, pp. 82-100.