BVCA British Private Equity & Venture Capital Association

DOWJONES

European Venture Capital: Myths and Facts

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Foreword

The venture capital market in Europe has, over the past thirty years, produced some extraordinary success stories. From the rise of global companies such as Skype and Autonomy, to the development of now-ubiquitous technology such as Bluetooth, there is much to celebrate within this industry.

But time and again we hear the industry denigrated as lagging behind our cousins in the US, with no shortage of views put forward as to why this is the case. How often do we hear the despairing cry of 'where is the European Facebook' without hearing a counterbalancing recognition of the many successful European companies that have flourished as a result of venture investment?

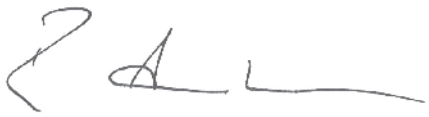
The retelling of these performance myths – whether they contain a measure of truth or not – has become received wisdom within the investment community and, as is to be expected, this has had a depressive impact on venture in Europe as a whole. And what impacts venture in Europe directly impacts the businesses that rely on the early stage high-risk investment that venture is best placed to provide. That is the sad irony - the myths we cling to harm our chances to grow the businesses that will dispel those very myths.

Not surprisingly, those of us in Europe involved in venture are always interested in research that will, by exposing the facts whether positive or negative, help to chip away at the myths hindering our industry. So we welcome this research by Ulf Axelson and Milan Martinovic both of the London School of Economics because it challenges three key myths of venture capital performance in Europe – that the likelihood of a successful VC exit is lower in Europe than in the US; that some vaguely understood determinants of success are tilted in favour of the US and against Europe; and that there is a chronic stigma around failure which harms European entrepreneurs.

The results provide for some interesting reading. They show that the US and Europe have roughly the same likelihood of an IPO exit, though Europe underperforms the US in trade sales. As far as the determinants of success, experienced VCs and entrepreneurs bring a greater likelihood of a successful exit, a fact that holds for both the US and Europe. In this case the differing results between the continents are down to Europe, having developed its venture sector later than the US, lagging the US in developing a pool of repeat entrepreneurs and experienced VCs - both of which factors have been rapidly changing for the better in recent years.

The final myth put on the block by the research is that of entrepreneurial fear of failure. In this matter the research proves what many in the venture community have believed for some time – that there is no evidence of a stigma surrounding failure. Whether this exists in the wider community is a moot point; what is important is that those taking the risks, whether they are the entrepreneur or investor, now tackle the situation in the "never say die" manner that we have long admired in Americans and wished for more in ourselves.

Ultimately, whilst it won't change perceptions overnight, the work of Mr Axelson and Mr Martinovic is a step in the right direction for venture in Europe, and for that it is welcome; the sooner we can dispel the myths that unnecessarily hinder venture in Europe, the sooner venture will have the chance to prove what it is genuinely capable of helping European businesses to achieve. The differences between the two markets are not the result of insurmountable truisms of geography or culture, and we on this side of the Atlantic can close the performance gap. In fact, we're almost there.



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Abstract

We examine the determinants of successful exits in European venture capital transactions and compare them to US transactions. Using survival analysis, we show that for both regions the probability of exit via an initial public offering (IPO) has gone down significantly over the last decade, while the time to IPO has gone up – in contrast, the probability of exit via trade sales and the average time to trade sales do not change much over time. Contrary to perceived wisdom, there is no difference in the success rates of European and US deals from the same vintage year with respect to IPO exits, while Europe has about an eight percentage point lower probability of exit via trade sales than the US. Venture success has the same determinants in both Europe and US, with more experienced entrepreneurs and venture capitalists being associated with higher probabilities of exit. The fact that repeat or 'serial' entrepreneurs are less common in Europe and that European VCs lag US VCs in terms of experience explains the remaining difference in performance. Finally, and contrary to perceived wisdom, we find no evidence of a stigma of failure for entrepreneurs in Europe.

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Introduction

Entrepreneurial activity is key for long term growth, yet financing start-up firms is wrought with challenges. Not only does a potential entrepreneur need to have the skills, the ideas, and the courage to start a new venture, but maybe most critically, also needs to be able to convince outside investors to provide the necessary funds. Because of the information problems and inherent riskiness of new ventures, successfully financing start-up companies requires actively involved expert investors. Furthermore, getting a decent return on investments into start-up firms within a reasonable time frame requires that capital markets are developed enough to allow for exits either through an initial public offering (IPO) or trade sale.

There is a widely held perception among both investors and policy makers that Europe is lagging behind the US in most dimensions with respect to the financing of entrepreneurship. The pool of potential entrepreneurs is perceived to be smaller, maybe because of a "stigma of failure" (Landier (2006).[1] The level of expertise amongst venture capitalists in Europe has also been criticised (see Kaplan, Martel, and Stromberg (2007), and Hege, Palomino, and Schwienbacher (2005)). Finally, exit opportunities are purported to be less favorable. These are not wholly unfounded perceptions; previous research shows a significant underperformance of European venture capital (see, for e.g., Hege, Palomino, and Schwienbacher (2005), who study a small sample of European deals from 1997 to 2003 on which return data is available).

Our goal in this paper is to evaluate how successful European venture capital is relative to US venture capital using the most extensive firm-level data set developed to date, Dow Jones VentureSource, and to analyse the main determinants of performance at the deal level. Ideally we would like to measure performance with investor returns, but for a majority of the deals we do not have that exact return information. We therefore follow the extant literature (of Bottazzi, Da Rin, and Hellman (2007), Sorensen (2007) and Gompers, Kovner, Lerner and Scharfstein (2006)) and measure success as either a successful exit through an IPO or a trade sale. We are also interested in the time it takes to exit, and how this has developed over time and across regions. In contrast to the studies mentioned above, we use survival analysis, which is the most natural econometric way to handle data of this sort.

1 This perception of a European stigma of failure is expressed in the following Communication by the European Commission from 1998: "In Europe, a serious social stigma is attached to bankruptcy. In the USA bankruptcy laws allow entrepreneurs who fail to start again relatively quickly and failure is considered to be part of the learning process. In Europe those who go bankrupt tend to be considered as "losers". They face great difficulty to finance a new venture."

Our dataset covers 35,798 companies that received VC investments between 1980 and 2011. 12,315 of these are in Europe (where the first year we use data from is 1995) and 23,483 in the US. We first confirm that US venture capital has indeed been substantially more successful on aggregate; a fraction of 38.8% had a successful exit over the entire period in the US compared to 25.3% in Europe.

We start by investigating the extent to which this difference depends purely on variables that have little to do with the relative merits of European vs. US venture capital, but purely depends on the timing, industry, and stage of investments. We show that much of the difference in success rates is due to differences in the timing of investments. Once we compare success rates between investment done in the US and in Europe in the same year, the estimated difference in probability of success between the US and Europe goes down from 16.6% to 9.1%. If we define success purely as exiting through an IPO, the difference between the US and Europe disappears completely once we control for the year of the investment – the entire difference is due to a lower probability of trade sales in Europe. Although success rates differ depending on the industry and life-cycle stage of the company at the time of the investment, differences in industry composition or stage of investment between the US and Europe explain none of the difference in success rates.

We also describe the general trend in exit probabilities and time to exit for the two regions. Perhaps not surprisingly for observers of the venture capital industry, there has been a remarkable shift downward in the probability of exit via IPOs in both regions, and contingent on doing an IPO, a significant shift upward in the average time to exit. What we find more surprising is that the process for trade sales is very stable over time, with little change in either the probability of exit or the time to exit.

We next go on to investigate the extent to which entrepreneurial characteristics and venture capitalist characteristics influence success rates. Similarly to Gompers et al (2010), we find that serial entrepreneurs, and in particular previously successful serial entrepreneurs, tend to do better on average in both regions. This explains part of the remaining difference in success rates between Europe and the US, since serial entrepreneurs account for only about 15% of deals done in Europe, but 35% of deals done in the US. For the subsample of companies with founders that are serial entrepreneurs, there is no difference in success between the two regions. We also find that a previously unsuccessful entrepreneur has at least as high a chance of getting financing for a new venture in Europe as in the US – hence, at least on this limited metric, we find no evidence for a ”stigma of failure” in Europe. We also find that female entrepreneurs and entrepreneurs with higher education (PhD or MD) tend to underperform.

We go on to relate success to the characteristics of venture capitalists. The experience of the venture capitalists on the board of the company – as measured by how many deals they have done relative to other VCs – is strongly related to success, and once we control for VC experience there is no difference in performance between the US and Europe. Since VC experience in Europe has gone up in the last couple of years, this is good news looking forward. We also find that having a VC represented on the board, having a VC that is specialized in the industry of the firm, using preferred shares, and syndicating deals are all features related to better performance, and that these variables have the same effect in the US and Europe.

Finally, we find that the effects noted above seem quite uniform across different European countries. There is some evidence of difference in performance across European countries, with the UK performing the best and Germany and the Benelux countries performing the worst.

The remainder of the paper is structured as follows. In the next section we describe our data sources, provide some general descriptive statistics, and perform our initial examination of exit rates. Section III investigates the effects of entrepreneurial and venture capitalist characteristics. Section IV concludes.

Data description and initial exit analysis

Our core data comes from Dow Jones VentureSource (previously called Venture One). VentureSource, established in 1987, collects data on firms that have obtained venture capital financing. Firms that have received early-stage financing exclusively from individual investors, federally chartered Small Business Investment Companies, and corporate development groups are included in the data but are not part of this analysis.

VentureSource tracks venture and private equity backed private companies from their initial round of financing until they achieve liquidity, become profitable with no plans for future financing, or go out of business. All institutional investors in the US, Europe, Israel, and China are surveyed quarterly. Thorough secondary research is conducted continuously (press releases, news articles, Internet). As a core of the research process, all private companies in the database are contacted on an ongoing basis. VentureSource contacts are primarily the CEOs and CFOs who confirm financings and inform them of future financing plans and general company developments.

The data include the identity of the key founders (the crucial information used in this study), as well as the industry, strategy, employment, financial history, and revenues of the company. Data on the firms are updated and validated through monthly contacts with investors and companies.[2]

VentureSource has quite good coverage of European deals since at least the year 2000. Table 1 describes the number of deals in the US and Europe covered by VentureSource, relative to the number of deals reported by the North American Capital Association (NVCA) for US and the European Venture Capital Association (EVCA) for Europe. The EVCA, in particular, pools together many later-stage buyout investments in their definition of venture capital, which explains the large numbers they report from 2001 to 2005. VentureSource does not suffer from this type of misclassification. It is clear from the table that the VentureSource coverage for Europe is somewhat spotty before the end of the 90's. The internet boom around 2000 and the following bust is evident for both samples. Figure 1 shows the number of distinct firms in our sample over time and across regions.

For most of the analysis we will disregard European deals done before 1995, a period in which VentureSource covers less than 100 deals per year and a very small fraction relative to the coverage in the EVCA data. We leave these deals out because of a concern that these earlier European deals are not representative of the full sample. In particular, although the fraction of exits in these early cohorts

2 The description in this paragraph of VentureSource is borrowed from Gompers, Lerner, and Scharfstein (2010).

is quite high (see Table 4), a very large proportion of exits happen after more than 10 years after the initial investment – leading to a concern that only deals with successful and late exits were picked up in the dataset.

Table 2 reports the split-up of firms in our sample across industries and stages of investment. The industry compositions are remarkably similar across the two regions, with the largest industry being Internet and Computer which represents 40% of all deals in both regions, followed by Biotech and Healthcare which represents around 20% of all deals. Early stage investment is more common in the US, whereas European venture capitalists invest more in revenue-generating businesses – revenue generating and profitable businesses represent 59% of all first-time investments in Europe, and 43% in the US. Table 3 gives the size of the initial investment by VCs, and, for the subsample in which we have this data, the post-money valuations at the time of the first investment. The initial ownership stake of VCs is the amount invested divided by the post-money valuation. Both amounts invested and valuations are higher in the US than in Europe; the average amount invested in the US is $5.7 million while it is $3.1 million in Europe, and the average post-money valuation in the US is $18 million while it is $11 million in Europe (all in 2005 dollars). Initial ownership stakes by VCs in both regions are around 30%.

Table 4 reports the number of IPOs and trade sales for Europe and the US by vintage year (defined as the year of the first investment by a venture capitalist). The total fraction of successful exits over the whole period for Europe is 25.0% (4.7% for IPOs and 20.3% for trade sales), where the corresponding number for the US is 37.4% (9.2% for IPOs and 28.2% for trade sales). The differences in success rates are highly statistically significant; Europe is clearly underperforming the US according to this metric.

The difference in successful exit probability between Europe and the US appears big, but is misleading due to the difference in distribution over time of the deals made in the two regions. Figure 2 plots the fraction of IPOs and trade sales over vintage years for the two regions (with bands of one standard error of the mean above and below indicated); the average difference in success rates looks much smaller once time effects are taken into account. In fact, for IPOs, there is no statistical difference in success rates between the two regions. Trade sales, however, are more common in the US than in Europe even controlling for the year of the investment.

It is also apparent from Figure 2 that success rates go down over time. A large part of this pattern can be explained by the fact that the final outcome for the investments made in the later part of the sample are still uncertain – many may still be exited successfully given enough time. Using survival analysis, we can modify our estimates of success probabilities to take this into account. A survival model assumes that a firm has a certain probability of going to IPO, being subject to a trade sale, or being liquidated at every point in time that it is still "alive", so that a firm that has an earlier investment year is subject to more chances of exit over time. More precisely, we do this by modelling the "hazard rate" $h_{j,i}(t)$ for type of exit i (IPO or trade sale) at time t since first VC financing for firm j. The hazard rate can be interpreted as the probability of exit during one unit of time conditional of not having exited up to time t. We use a competing risk Cox proportional hazard model (see Cleves et al (2010) and Cameron and Trivedi (2005)), in which the hazard rates evolve according to:

$$h_{j,i}(t) = h_{0,i}(t) * exp(\beta_{0,i} + x_{j,i,t}\beta_{x,i})$$

where $h_0(t)$ is a non-parametric "base rate" to be estimated, $\boldsymbol{x}_{j,i,t}$ is a vector of potentially time-varying explanatory variables, and $\beta_{0,i}$ and $\beta_{x,i}$ are coefficients to be estimated. Once we have estimated hazard rates, we can calculate probabilities of exit and expected time to exit.

We start by non-parametrically estimating hazard rates without any explanatory variables for the two regions. The estimated cumulative density functions for IPOs and trade sales combined across the two regions are plotted in Figure 3a, while Figures 3b and 3c give the cumulative density for IPOs and trade sales separately. The estimation takes into account the fact that later deals may not have had time to exit yet. The total probability of exiting via an IPO is estimated to be 13.1% in the US and 6.2% in Europe, while for trade sales the corresponding numbers are 43.7% for the US and 34.0% for Europe. (These numbers can be read off the graphs in Figures 3b and 3c and are also reported in Table 5.) Exits tend to occur at the most intensive rate between months 10 and 90, although a surprisingly large fraction of exits (almost 20%) occur more than 10 years after the initial investment. The median time to exit is four years (Table 5, Panel B).

Figure 3 hides important calendar time variation in the data, as it pools together all deals regardless of the year of investment. In figure 4, we provide cumulative density functions for exit for each cohort year from 1995 to 2010. Splitting up the sample across different vintage years provides several takeaways:

1. As noted above, the difference in success rates between the US and Europe goes down significantly (although it does not disappear) once we compare deals of the same vintage year. This is because European deals are relatively more prevalent in the later part of the sample, where success rates are lower globally.

2. Certain periods are related to higher exit rates for all cohorts and regions, especially the years 1999-2000.

3. US and European cumulative density functions look proportional.

4. Success rates have gone down more or less uniformly across time, and time to exit appears to have gone up across time.

In Figure 5, we separate between IPOs and trade sales. In both regions, IPO intensity is the highest between 1998 and 2000 and virtually dies out after this period, while trade sales happen more continuously through time. Finally, Europe and the US are much more similar in terms of the IPO process than the trade sales process. Europe does not seem to be underperforming with respect to IPOs once we control for the vintage year whereas Europe definitely underperforms with respect to trade sales.

We also note that for European trade sales, the earlier years (1995-1998) have a peculiar tendency for a large fraction of late exits. There is a concern that this might be due to misrepresentative data (old firms with late exits have a higher probability of being back-filled into the data.) Our results are robust to excluding these deals from the analysis.

Table 5 summarises exit probabilities calculated with our hazard model for different time periods, regions, and exit types. IPO probabilities at all horizons have gone down by at least two thirds since the 90s, and conditional on an IPO, the time to exit has gone up. In contrast, both probability of exit and time to exit for trade sales stay remarkably constant throughout the sample.

Using these insights, we next estimate a model where we control for time explicitly. We do this by pooling observations across regions, adding yearly calendar time dummies, and a European dummy. The idea behind the calendar time dummies is that market conditions in a given year affect the probability of exit in that year for all cohorts of "live" firms in a proportional way. Table 6 reports the results from this regression. Specifications 1 to 3 combines IPOs and trade sale exits, specifications 4 to 6 look only at IPOs, while specifications 7 to 9 look only at trade sale exits. For each type of exit, we use three sets of explanatory variables: First, a Europe dummy only (specifications 1, 4, and 7); second, calendar time dummies (specifications 2, 5, and 8), and third, both time, industry, stage, and round fixed effects (specifications 3, 6, and 9).

We note that IPOs and trade sales have very different characteristics. Calendar time variation is much more important for IPOs. All of the difference in IPO rates between the US and Europe are explained by time variation, whereas none of the difference with respect to trade sales is. Combining IPOs and trade sales, the coefficient on the European dummy in Specification 3 (which includes all fixed effects) is negative 0.265. Interpreted in probability terms, this means that European deals have 9.1 percentage points lower probability of exiting, while the corresponding number without controlling for time fixed effects is 16.6 percentage points.

Also, in unreported regressions we confirm that controlling for the vintage year of the investment does not add much once calendar time dummies are introduced, and clustering by vintage year does not change the qualitative nature of the results. The results also remain qualitatively the same if we restrict ourselves to deals done in 1999 or later.

Figure 6 plots the time dummies for IPOs and trade sales separately. This figure illustrates the volatility of the IPO market relative to the trade sales market, and the decline in IPOs in the last decade.

Entrepreneurial and Venture Capitalist Variables

We now go on to investigate the role of the entrepreneurial climate and the sophistication of VCs for success rates.

A. Entrepreneurial variables

Having a large pool of good potential entrepreneurs is obviously important for a successful entrepreneurial climate, as is the capability of separating the good entrepreneurs from the bad when financing decisions are made. Using the VentureSource data for US firms financed up to 2003, Gompers et al (2010) have shown evidence of persistent skill differences between entrepreneurs, and evidence that venture capitalists are able to identify these skills in their financing decisions. More specifically, they provide three insights. First, entrepreneurs that get financing for a second venture are more likely to have been successful in their first venture than the total population of entrepreneurs, showing that venture capitalists do believe that success is a signal of persistent skill (or, alternatively, that entrepreneurs who have been successful are more eager to start a second venture than other entrepreneurs). Secondly, these entrepreneurs are more successful on average in their second venture than the general population, showing that VCs appear to have been justified in their belief that success predicts success. Finally, they show that entrepreneurs who were unsuccessful in their previous venture but still get financing for a second venture perform no worse than the average entrepreneur. This last finding is consistent with VCs screening properly when financing previously unsuccessful entrepreneurs.

The results in Gompers et al (2010) also suggest that the existence of a pool of serial entrepreneurs may be important for the success of the venture industry. First, this pool of proven entrepreneurs can be dipped into when financing new ventures. Second, it may be that experience itself (whether positive or negative) can build skill for future ventures. The existence of such a pool may be threatened if society attaches a high “stigma of failure” to failed entrepreneurs (see Landier (2006)), and several people have argued that Europe is in the “bad equilibrium” where potential entrepreneurs are discouraged from trying out new ventures from a fear of the consequences of failure.

We extend the analysis in Gompers et al (2010) to also cover European entrepreneurs, and make some preliminary investigation into the existence of a stigma of failure in Europe. VentureSource tracks the identity and some characteristics of founders in entrepreneurial firms. We classify an entrepreneur as being experienced if VentureSource indicates him or her as having been a founder of a previous venture. This may involve ventures that are not covered in the database. When a previous venture of an entrepreneur is covered in the database, we can also measure whether the venture had a successful exit or not.

For a venture with several founders, we classify the firm as having experience if one of the founders has experience, and we classify a previous venture as being successful if one of the founders had a successful experience.

The proportion of firms with a founder with an entrepreneurial background is reported in Figure 7. Since 1995, this proportion is around 35% in the US and around 15% in Europe, with fairly small yearly variations. Hence, we confirm that venture capitalists in the US seem to be able to dip into a deeper pool of experienced entrepreneurs.

In Figure 8 we investigate the stigma of failure by looking at how many of the repeat entrepreneurs getting financing were unsuccessful in their previous venture. Using this measure, there is no evidence for a larger stigma of failure in Europe relative to the US – in fact, the proportion of firms with entrepreneurs who previously failed is larger in Europe than the US.

Figure 9 shows success rates (combining IPOs and trade sales) for first time entrepreneurs and serial entrepreneurs in the two regions. Success rates are somewhat higher for repeat entrepreneurs (in their later ventures) both in Europe and in the US. The figures also show that the first venture of entrepreneurs who later become repeat entrepreneurs do much better on average than other first ventures. This is not surprising, as unsuccessful first time entrepreneurs are less likely to get financing for a second venture. The pattern looks similar in Europe and the US, and is consistent with a story in which venture capitalists rationally update their beliefs about the talent of entrepreneurs after observing their first venture.

We go on to examine the extent to which entrepreneurial characteristics can explain the difference in success rates between the US and Europe in a regression framework. Table 7 reports the results. Note that we have to restrict the analysis to the subset of data where we have enough information about founders, which reduces the set of firms from 35,798 to 34,887. Although the set of firms without founder data have lower success rates on average, dropping these observations does not seem to affect our general results.

In Specification 1, we include experience of the founders of a firm, and, for the set of firms that have founders that are serial entrepreneurs and where data availability allows, whether previous ventures where successful or not. Founder experience is strongly related to success. For the observations where we have data on the success on previous ventures, we confirm the result in Gompers et al (2010) that the better performance of serial entrepreneurs is mostly driven by the previously successful serial entrepreneurs. Including the entrepreneurial variables partly explains the difference between the US and Europe (the coefficient on the Europe dummy goes from negative 0.265 in Specification 3 of Table 6 to negative 0.229, which corresponds to a decrease in the difference in success rates from 9.1 percentage points to 8.3 percentage points).

In Specifications 2 and 3, we split the sample into the set of firms with experienced founders (Specification 2) and inexperienced founders (Specification 3). For the set of firms with experienced founders, there is no difference in success rates between Europe and the US. The difference comes entirely from the set of firms with inexperienced founders, where Europe does significantly worse.

In Specification 4, we introduce other characteristics of entrepreneurs, as well as interaction terms on explanatory variables with the European dummy to investigate whether entrepreneurial characteristics have the same effect in Europe as in the US. Founders with a PhD or an MD degree are associated with lower

success rates, especially in Europe. Female founders are also associated with significantly lower success rates. This is consistent with venture capitalists being more willing to finance marginal ventures backed by highly educated or female founders than other founders. Founder experience is significantly more strongly associated with success in Europe than in the US. Finally, in Specifications 5 and 6, we run competing risk models for exit via IPO and trade sales separately. Here, we use as a measure for success on previous venture only exits via IPOs in Specification 5 and only exit via trade sales in Specification 6. As before, IPOs are no less likely in Europe than in the US, whereas trade sales are less likely in Europe. For IPOs, the main differences to the regressions on aggregate exits are that all experience and success measures seem more significant, and that having a founder with a PhD or MD is now significantly positively related to success. For trade sales, the opposite seems to hold.

B. Venture capitalist and contracting variables

It has been shown in several studies that venture capitalist experience is related to the success of ventures (see Sorensen (2007), Gompers et al (2010), Gompers, Kovner, and Lerner (2009), and Hochberg, Ljungquist, and Lu (2007)). This could be either because of influence (experienced VCs are better at bringing firms to exit through value-added advice, monitoring, or resources) or sorting (experienced VCs are better at picking good firms to invest in, or the good firms choose to go with the more experienced VCs). For our main purpose, which is to check the extent to which the degree of VC sophistication can explain differences in success rates between the US and Europe, it is not crucial to distinguish between the influence and the sorting channel.

We follow Gompers et al (2010) and define experience for a particular VC with board representation at a company as the log of one plus the number of prior companies in which the VC has invested minus one plus the average number of previous investments undertaken by venture capital firms in the year of the investment.

If there is more than one venture capital firm represented on the board, we define VC experience for that firm as the maximum of the experience amongst the different VCs. We also create an individual-specific measure of experience for the particular partner of the VC firm represented on the board to investigate whether VC firm experience or particular partner experience seems more important.

Following Gompers, Kovner, and Lerner (2009), we also measure the extent to which VC or partner specialisation is related to success. We measure specialisation as the fraction of previous deals done by the venture capitalist or partner in the same industry as the current company, out of all deals done by the venture capitalist or partner previously. If there are several VCs / partners represented on the board, we take the maximum across these. We require that a VC / partner has done at least 5 / 3 deals previously in total, otherwise we set specialisation to zero.

We also measure whether a firm is financed by a syndicate or not, as syndication has been related to success in previous studies (see e.g. Hege, Palomino, and Schwienbacher (2009), and Bottazzi, Da Rin, and Hellmann (2008)). Finally, VentureSource sometimes has information about whether VCs use preferred shares or not. Kaplan, Martel, and Strömberg (2007) argue that what they term “US style contracts”, which prominently includes relying on convertible preferred securities rather than straight equity for the venture capitalist, is a better way of

contracting and leads to higher success rates. We do not know exactly what type of contracts are captured by VentureSource's classification of "preferred shares", and this information is also missing for a large set of companies, but our results (see below) are in line with the findings in Kaplan, Martel, and Strömberg.

Table 8 shows the number of distinct venture capital organisations represented in our dataset across the two regions and across time in our dataset, as well as the number of deals associated with each organisations. Note that we only have this information for VCs that are represented on the board of companies. In total, 5,131 distinct US VC organisations and 2,388 European VC organisations were active during some part of the period covered by our data.

Figure 10 shows the median VC experience measure over time for the two regions, as well as the interquartile range. The US has on average higher experience, but the difference has become smaller over time. Still, in 2010, the median experience for European VCs was as small as the 25th percentile of US VCs, whereas the 75th percentile European VC was no more experienced than the median US VC.

Table 9 shows the results of a multivariate regression of success including VC characteristics as explanatory variables. One problem is that we can only calculate VC characteristics when we have board data, and this information is missing for 8,940 out of our 35,798 portfolio companies. To investigate whether the remaining observations constitute a biased sample, we first run a regression over the whole sample including a dummy for whether we have board data or not (Specification 1 of Table 9). The observations without board data have significantly lower success rates. Furthermore, once we control for whether we have board data or not, the European dummy goes up significantly (from negative 0.265 to negative 0.226). This is partly due to the fact that proportionately more of the European deals have missing board data. However, we also show that Europe seems to be doing proportionately worse on these deals relative to the deals with board data. In Specification 2 we run the same regression on only the observations with board data, and here the European dummy goes up to negative 0.178 but is still highly significant. In Specification 3 we run the same regression for the subsample without board data, where the European dummy goes down to negative 0.492. To summarise, this means that our investigation of the subsample with board data is likely to underestimate the difference between Europe and the US in the total sample. Bearing this in mind, we go on to investigate the explanatory power of venture capitalist variables for success rates.

Specification 4 of Table 9 shows our main result, which is that once we control for whether the VC has a seat on the board or not, and if so, how experienced the VC is, there is no difference in success rates between Europe and the US. Having VC board representation and VC experience are both associated with success, and as is obvious from Figure 10, European venture capitalists have lower experience on average than US VCs.

Specification 5 introduces VC specialisation, which is also positively related to success. Specification 6 uses experience and specialisation measures for the individual partners sitting on the board instead of the VC firm they represent. The results are qualitatively the same; partner experience and specialisation are positively related to success. When we run both VC and partner variables together (Specification 7), it appears that VC firm experience is more important than partner experience, whereas partner specialisation is more important than VC firm specialisation. In the remaining tests we therefore keep these two

explanatory variables. In unreported regressions, we interact all variables with the European dummy, but these interaction variables are insignificant, indicating that explanatory variables have the same effect in Europe and the US.

In Table 10, Specification 1, we also include our entrepreneurial variables. Although the direction of all variables is the same as before, the European dummy becomes significantly positive once we control for both VC and entrepreneurial experience. This is even more true in Specification 2, where we also introduce dummies for whether the deal is syndicated and whether preferred shares are used (both variables are significantly related to success). Specifications 3 and 4 do the same analysis for IPOs only. European deals very strongly outperform with respect to IPOs once we control for VC and entrepreneurial experience. However, as is shown in Specifications 5 and 6, Europe still underperforms with respect to trade sales.

Finally, in Table 11, we introduce country fixed effects into the regression to see whether there are significant differences across different regions of Europe and whether accounting for these changes any of our previous conclusions. The answer to both these questions is no; the coefficient on most country dummies stay close to the previously estimated coefficient on the European dummies, and all other variables have virtually the same coefficients. The difference we do find is that the UK appears to do better than the median country in Europe, while Germany and the Benelux countries appear to do worse in most specifications. However, Germany does extremely well when we look at IPOs only, perhaps related to the NeueMarkt.

Conclusions

We examine determinants of successful exits in European venture capital transactions and relate them to US transactions. Using survival analysis, we show that for both regions the probability of exit via an IPO has gone down significantly over the last decade, while the time to IPO has gone up – in contrast, the probability of exit via trade sale and the average time to trade sale do not change much over time. Contrary to perceived wisdom, there is no difference in success rates between European and US deals from the same vintage year with respect to IPO exits, while Europe has about an eight percentage point lower probability of exit via trade sales than the US. Venture success has the same determinants in both Europe and US, with more experienced entrepreneurs and venture capitalists being associated with higher probabilities of exit. The fact that repeat entrepreneurs are less common in Europe and that European VCs lag US VCs in experience explains the remaining difference in performance. Also, contrary to perceived wisdom, we find no evidence of a stigma of failure for entrepreneurs in Europe.

Obviously, our way of measuring what is a successful venture by looking at whether the venture went to IPO or did a trade sale is far from ideal. Not only are IPOs typically more lucrative than trade sales, but a longer time to exit everything else equal is worse for the return of the venture. Ideally, our success measure should be the properly risk-adjusted return associated with each deal. First, this requires knowing the exact amount and timing of investment into each deal, the exact exit amount, and the percentage stake of venture capitalists. The coverage in VentureSource with respect to return data is not surprisingly much more sparse than the coverage of exits, and there is a concern that the subset where return data exists is biased towards the more successful deals. Furthermore, adjusting properly for risk in these illiquid untraded assets is a major challenge (see Cochrane (2005) and Korteweg and Sorensen (2010) for attempts to measure return and risk with this type of data and discussions of the problems involved).

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Appendix

Table 1: VC investment amount per year (Million US dollars)

The table shows current US dollar amounts (in millions) invested by venture capitalists in a given year, as captured by VentureSource, the European Venture Capital Association (EVCA), and the North American Venture Capital Association (NVCA).

	Europe		United States	
Year	VentureSource	EVCA	VentureSource	NVCA
1980			7	
1981	0		74	
1982			267	
1983	9		1,498	
1984	0		1,711	
1985	3		1,996	
1986	8		1,967	
1987	7		2,123	
1988	17		2,072	
1989	13	2,336	2,409	
1990	21	2,980	2,727	
1991	10	3,417	2,729	
1992	29	3,146	3,480	
1993	53	2,443	3,833	
1994	60	3,089	4,654	
1995	136	3,390	6,703	7,313
1996	334	3,952	9,664	10,568
1997	562	4,618	12,941	14,137
1998	1,444	6,703	17,413	19,780
1999	5,567	11,369	48,058	51,329
2000	18,270	18,140	91,903	99,158
2001	9,043	10,912	35,702	38,065
2002	4,870	9,255	21,779	20,850
2003	3,842	9,470	19,369	18,614
2004	4,868	12,776	22,447	22,355
2005	4,808	15,791	23,806	22,946
2006	5,656	21,677	29,730	26,594
2007	6,378	8,491	32,023	30,826
2008	6,927	10,087	30,879	30,546
2009	4,750	5,748	23,969	19,746
2010	6210	4,978	29,511	23,263
2011	4153		22,730	28,425
Total	**88,048**	**174,767**	**510,172**	**484,516**

Source: Dow Jones VentureSource, EVCA, NVCA

Table 2: Industry and Stage composition across regions

The table shows fraction of deals across regions that fall into different industries and into different stages of investments.

	Europe		US		Europe & US	
Industry Group	**# of deals**	**% of total**	**# of deals**	**% of total**	**# of deals**	**% of total**
Biotech and health care	2,251	18.1%	4,881	20.8%	7,132	19.8%
Business services	1,260	10.1%	2,052	8.7%	3,312	9.2%
Business/industrial	638	5.1%	596	2.5%	1,234	3.4%
Communications and electronics	1,660	13.3%	4,404	18.7%	6,064	16.9%
Consumer	873	7.0%	1,266	5.4%	2,139	5.9%
Energy	395	3.2%	404	1.7%	799	2.2%
Financial services	303	2.4%	671	2.9%	974	2.7%
Internet and computer	5,011	40.2%	9,156	39.0%	14,167	39.4%
Other	66	0.5%	76	0.3%	142	0.4%
Total	**12,457**	**100.0%**	**23,506**	**100%**	**35,963**	**100.0%**
Stage of investment						
Startup	1,864	15.0%	3,940	16.8%	5,804	16.1%
Product Development	3,111	25.0%	7,748	33.0%	10,859	30.2%
Product In Beta Test	143	1.1%	693	2.9%	836	2.3%
Generating Revenue	6,965	55.9%	9,257	39.4%	16,222	45.1%
Profitable	371	3.0%	914	3.9%	1,285	3.6%
Restart	3	0.0%	50	0.2%	53	0.1%
N/A	0	0.0%	904	3.8%	904	2.5%
Total	**12,457**	**100.0%**	**23,506**	**100.0%**	**35,963**	**100.0%**

Source: Dow Jones VentureSource

Table 3: Investment amounts and valuations across regions (2005 million US dollars)

The top panel shows the amount invested by VCs in the first round of financing by VCs in 2005 US dollars (millions). The bottom panel shows post-money valuations, where available, at the first round of VC financing.

Panel A: Funds invested at the time of the first VC financing round (in millions 2005 USD)

	Europe					US				
	percentile				# of	percentile				# of
Stage of investment	25th	50th	75th	mean	deals	25th	50th	75th	mean	deals
Startup	0.30	0.75	1.85	2.38	1,472	0.61	1.32	3.26	2.84	3,500
Product Development	0.52	1.28	3.14	3.34	2,458	1.41	3.45	6.87	6.15	7,118
Product In Beta Test	0.46	1.30	3.07	3.05	101	1.74	3.10	5.51	4.34	632
Generating Revenue	0.55	1.34	3.11	3.11	4,960	1.67	3.55	7.19	6.49	8,088
Profitable	0.80	1.94	4.39	3.98	313	2.34	5.07	10.53	10.10	839
Restart	0.27	1.88	1.89	1.35	3	1.19	2.25	5.19	3.76	48
N/A					0	0.93	2.24	4.39	3.32	788
Total	**0.49**	**1.24**	**2.95**	**3.09**	**9,307**	**1.29**	**3.06**	**6.32**	**5.72**	**21,013**

Panel B: Valuations at the time of the first VC financing round (in millions 2005 USD)

	Europe					US				
	percentile				# of	percentile				# of
Stage of investment	25th	50th	75th	mean	deals	25th	50th	75th	mean	deals
Startup	1.08	2.63	5.79	7.05	711	2.37	4.56	8.77	7.83	1,234
Product Development	1.92	4.34	10.07	9.11	979	5.27	9.63	16.75	15.25	2,886
Product In Beta Test	1.75	4.22	9.12	9.96	33	5.26	9.99	17.55	13.31	239
Generating Revenue	2.30	5.34	11.93	12.07	2,032	6.38	12.24	24.28	23.24	2,928
Profitable	3.69	8.43	18.42	26.86	162	8.77	17.55	41.58	36.73	367
Restart	5.40	5.40	5.40	5.40	1	3.23	4.75	10.53	6.89	27
N/A					0	3.78	7.09	13.55	12.75	88
Total	**1.90**	**4.53**	**10.45**	**11.01**	**3,918**	**4.92**	**9.65**	**18.42**	**17.98**	**7,769**

Source: Dow Jones VentureSource

Table 4: Success rates across regions and years

The table shows fraction of deals for a given investment year that subsequently underwent an IPO or a trade sale. The last two columns tests the difference in means between Europe and the US for IPOs and trade sales, respectively. A positive (negative) t-statistic with absolute value larger than 2 means that Europe has a higher (lower) success rate at the 95% significance level. The t-tests in the last row is for difference in means for total success rates across times.

	Europe			US			t-test of means	
Year	**# deals**	**IPO**	**Trade Sales**	**# deals**	**IPO**	**Trade Sales**	**IPO**	**Trade Sales**
bef1980	1	0.0%	100.0%	23	69.6%	26.1%	.	.
1980	1	100.0%	0.0%	18	83.3%	5.6%	.	.
1981	2	0.0%	100.0%	54	38.9%	22.2%	-1.108	2.913
1982	0			141	29.1%	34.8%		
1983	3	0.0%	33.3%	340	20.3%	34.7%	-0.871	0.025
1984	1	0.0%	100.0%	328	22.6%	41.8%	.	.
1985	4	100.0%	0.0%	324	25.3%	34.9%	3.425	-1.400
1986	4	0.0%	25.0%	278	29.9%	35.6%	-1.300	-0.341
1987	3	33.3%	0.0%	278	30.9%	37.1%	0.089	-1.294
1988	8	50.0%	37.5%	248	40.3%	35.5%	0.547	0.336
1989	14	42.9%	35.7%	260	37.3%	38.5%	0.416	0.025
1990	11	27.3%	18.2%	269	27.5%	39.0%	-0.017	-1.215
1991	12	25.0%	25.0%	249	39.8%	36.5%	-1.022	-0.652
1992	20	30.0%	30.0%	341	31.1%	43.4%	-0.102	-1.003
1993	24	37.5%	25.0%	367	28.6%	38.4%	0.927	-0.986
1994	34	11.8%	47.1%	417	27.8%	39.6%	-2.042	1.026
1995	71	18.3%	32.4%	561	23.5%	42.2%	-0.985	-1.428
1996	116	19.0%	36.2%	808	22.5%	45.5%	-0.864	-1.523
1997	241	14.9%	31.1%	911	16.2%	45.0%	-0.493	-3.661
1998	520	12.9%	39.6%	1,073	12.6%	44.4%	0.170	-1.401
1999	1,170	11.2%	34.7%	2,086	5.8%	42.1%	5.553	-4.011
2000	2,539	5.0%	29.7%	2,897	2.9%	37.1%	4.009	-5.778
2001	1,201	3.3%	26.8%	1,101	4.2%	36.1%	-1.071	-4.204
2002	606	4.3%	28.2%	715	4.8%	34.4%	-0.404	-2.359
2003	522	4.6%	24.5%	691	2.5%	34.9%	2.041	-3.684
2004	556	4.0%	18.5%	867	3.3%	29.4%	0.606	-4.217
2005	586	1.5%	16.7%	984	1.7%	22.0%	-0.288	-2.442
2006	739	1.8%	11.8%	1,168	1.5%	21.7%	0.519	-5.197
2007	943	0.5%	10.7%	1,399	0.9%	12.9%	-0.916	-1.555
2008	786	0.8%	4.2%	1,400	0.2%	9.9%	1.925	-4.654
2009	611	0.7%	2.3%	994	0.2%	7.5%	1.445	-4.364
2010	649	0.2%	1.5%	1,059	0.4%	2.7%	-0.830	-1.733
2011	459	0.0%	0.0%	857	0.0%	0.6%	.	-1.640
Total	**12,457**	**4.7%**	**21.0%**	**23,506**	**9.2%**	**29.6%**	**-15.342**	**-17.532**

Source: Dow Jones VentureSource

Table 5: Summary success rates and exit times across regions and years

Panel A shows estimated probability of exit within a certain time frame from first round of VC financing. Probabilities are estimated using a Kaplan-Meier estimator for each specific region and time frame. Panel B shows median exit times in months conditional on exit within a certain time frame, together with the interquartile range (25th percentile and 75th percentile).

Panel A

		IPO probability				Trade Sale probability			
		US		Europe		US		Europe	
		Prob.	st.error	Prob.	st.error	Prob.	st.error	Prob.	st.error
Ever:	Whole sample	13.1%	(0.31%)	6.2%	(0.30%)	43.7%	(0.52%)	34.0%	(1.35%)
Within 10 years:	Whole sample	11.0%	(0.24%)	5.6%	(0.24%)	35.8%	(0.37%)	27.9%	(0.50%)
	1995-1999 vintages	12.5%	(0.45%)	12.2%	(0.71%)	40.0%	(0.66%)	32.2%	(1.01%)
	2000-2003 vintages	3.1%	(0.24%)	4.4%	(0.30%)	35.5%	(0.66%)	27.8%	(0.65%)
Within 5 years:	Whole sample	6.9%	(0.18%)	3.5%	(0.18%)	21.2%	(0.29%)	14.8%	(0.35%)
	1995-1999 vintages	10.2%	(0.41%)	8.3%	(0.60%)	26.3%	(0.60%)	14.4%	(0.76%)
	2000-2003 vintages	1.4%	(0.16%)	2.9%	(0.24%)	20.9%	(0.55%)	17.1%	(0.54%)
	2004-2007 vintages	1.2%	(0.18%)	1.7%	(0.24%)	18.3%	(0.61%)	12.5%	(0.65%)
Within 2 years:	Whole sample	2.3%	(0.10%)	1.7%	(0.12%)	7.0%	(0.17%)	4.0%	(0.18%)
	1995-1999 vintages	4.8%	(0.29%)	5.1%	(0.48%)	10.5%	(0.42%)	4.2%	(0.44%)
	2000-2003 vintages	0.2%	(0.06%)	1.2%	(0.15%)	6.9%	(0.35%)	4.9%	(0.31%)
	2004-2007 vintages	0.1%	(0.06%)	1.1%	(0.19%)	5.0%	(0.33%)	3.5%	(0.34%)
	2008-2011 vintages	0.2%	(0.08%)	0.5%	(0.17%)	6.1%	(0.46%)	2.2%	(0.36%)

Panel B

		IPO time to exit (months)				Trade Sale time to exit (months)			
		US		Europe		US		Europe	
		Med.	(25;75)	Med.	(25;75)	Med.	(25;75)	Med.	(25;75)
Ever:	Whole sample	46	(26;73)	37	(18;70)	49	(27;78)	52	(30;78)
Within 10 years:	Whole sample	43	(25;66)	36	(17;66)	45	(26;70)	50	(29;74)
	1995-1999 vintages	32	(18;49)	30	(14;73)	45	(24;73)	65	(38;89)
	2000-2003 vintages	62	(48;83)	51	(24;66)	52	(29;76)	50	(30;74)
Within 5 years:	Whole sample	32	(21;44)	24	(12;39)	32	(20;45)	34	(21;46)
	1995-1999 vintages	25	(15;38)	21	(12;31)	30	(18;44)	36	(22;48)
	2000-2003 vintages	46.5	(34;55)	36	(15;51)	33	(20;47)	35	(22;47)
	2004-2007 vintages	43	(31;53)	22	(12;33)	36	(22;46)	33	(22;44)
Within 2 years:	Whole sample	16	(11;22)	13	(7;19)	17	(12;20)	16	(11;20)
	1995-1999 vintages	15	(10;20)	13	(9;19)	16	(11;20)	16	(12;20)
	2000-2003 vintages	23	(15;23)	9.5	(3;19.5)	17	(12;20)	16	(11;21)
	2004-2007 vintages	8.5	(7;11)	14	(9;22)	17	(12;20)	15.5	(11;20)
	2008-2011 vintages	10	(10;19)	18	(7.5;20)	17	(11;20)	17	(9;20)

Source: Dow Jones VentureSource

Table 6: Regression of exit hazard with time, industry, and deal type fixed effects

The table shows regressions using a Cox proportional hazard model. The dependent variable is the hazard rate of IPO or trade sale exit. The unit of observation is the firm-year to reflect the possibility that the firm can potentially exit in any year. *Europe* is a dummy equal to one for European deals. Year fixed effects are controlled by respective dummies. Industry and stage classifications are reported in Table 2. Round fixed effects refer to the round number of financing when VC invested for the first time. Standard errors are in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1) IPOs & Trade sales	(2) IPOs & Trade sales	(3) IPOs & Trade sales	(4) IPOs	(5) IPOs	(6) IPOs	(7) Trade sales	(8) Trade sales	(9) Trade sales
Europe	-0.447***	-0.274***	-0.265***	-0.695***	0.102*	0.131**	-0.335***	-0.360***	-0.359***
	(0.021)	(0.022)	(0.022)	(0.048)	(0.052)	(0.053)	(0.023)	(0.024)	(0.024)
Calendar year fixed effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Industry, stage, and round	No	No	Yes	No	No	Yes	No	No	Yes
Fixed effects									
Observations	273,212	273,212	273,212	273,212	273,212	273,212	273,212	273,212	273,212
Log likelihood	-120,896	-119,985	-119,723	-27,212	-25,675	-25,456	-94,815	-94,663	-94,447
Chi squared	494.2	2315	2839	209.8	2689	3395	212.5	502.9	906.9
Number of deals	35,798	35,798	35,798	35,798	35,798	35,798	35,798	35,798	35,798
Number of exits	12,221	12,221	12,221	2,697	2,697	2,697	9,524	9,524	9,524

Source: Dow Jones VentureSource

Table 7: Entrepreneurial experience and characteristics

The table shows regressions using a Cox proportional hazard model. The dependent variable is the hazard rate of IPO or trade sale exit. The unit of observation is the firm-year to reflect the possibility that the firm can potentially exit in any year. *Europe* is a dummy equal to one for European deals. *Founder experience* is a dummy equal to one if any of the firm's founders founded another business. *Data on previous venture* is a dummy equal to one if any of the firm's founders founded a VC-funded venture that is recorded by VentureSource. *Success on previous venture* is a dummy equal to one if a previously VC-funded venture was successful. *PhD or MD Founder* is a dummy equal to one if any of the firm's founders has a doctorate degree. *Female founder* is a dummy equal to one if any of the firm's founders is a female. Year fixed effects are controlled by respective dummies. Industry and stage classifications are reported in Table 2. Round fixed effects refer to the round number of financing when VC invested for the first time. Standard errors are in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	IPOs & Trade sales	**IPOs & Trade sales**	**IPOs & Trade sales**	**IPOs & Trade sales**	**IPOs**	**Trade sales**
Europe	-0.229***	-0.0671	-0.277***	-0.248***	0.0951	-0.360***
	(0.0228)	(0.047)	(0.026)	(0.028)	(0.0693)	(0.03)
Founder experience	0.196***			0.160***	0.405***	0.0141
	-0.0233			(0.0263)	(0.0544)	(0.0303)
Data on previous venture	-0.165**	-0.162**		-0.153**	-0.478***	-0.0603
	(0.0664)	(0.0672)		(0.0733)	(0.113)	(0.0608)
Success on previous venture	0.179**	0.191***		0.184**	0.746***	0.169**
	(0.0728)	(0.0732)		(0.0792)	(0.153)	(0.0735)
PhD or MD Founder				-0.0386	0.225***	-0.131***
				(0.0304)	(0.0581)	(0.0347)
Female founder				-0.113**	-0.216**	-0.0816*
				(0.0441)	(0.108)	(0.0479)
Europe*Founder experience				0.193***	0.494***	0.108*
				(0.0559)	(0.116)	(0.0647)
Europe*Data on previous venture				-0.0616	-0.0959	-0.0981
				(0.172)	(0.298)	(0.174)
Europe*Success on previous venture				0.0259	-0.289	0.197
				(0.215)	(0.56)	(0.232)
Europe*PhD or MD Founder				-0.115**	-0.148	-0.0586
				(0.0543)	(0.113)	(0.0609)
Europe*Female founder				0.0559	-0.0659	0.0564
				(0.0844)	(0.224)	(0.0912)
Year, Industry, stage, and round	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects						
Observations	262,138	65,679	196,459	262,138	262,138	262,138
Log likelihood	-116,825	-29,498	-80,064	-116,810	-92,308	-24,643
Chi squared	3,001	826.9	2151	3,031	903.8	3,612
Number of deals	34,887	9,297	25,590	34,887	34,887	34,887

Source: Dow Jones VentureSource

Table 8: Number of VC organization and deals per VC organization

The table shows the number of distinct VC organizations active on the board in the year of the first round of VC financing in each region where VentureSource has data on boards. For each active VC firm the total number of previous deals in which it was active on the board was computed and the mean and median statistics are reported for all VC firms active in a given year for both regions. The total number of active VC firms represents the set of distinct VC organizations that were active at least once in our dataset.

	US			Europe		
		# previous deals by VC			# previous deals by VC	
Year	# VCs active	Mean	Median	# VCs active	Mean	Median
1980	34	0.1764706	0	1	0	0
1981	66	0.3636364	0	0	.	.
1982	134	0.4402985	0	0	.	.
1983	212	0.9622642	0	0	.	.
1984	263	1.81749	1	0	.	.
1985	304	2.414474	1	4	4.25	2
1986	311	3.33119	2	2	14.5	14.5
1987	367	3.749319	2	0	.	.
1988	374	4.713904	2.5	10	0.1	0
1989	395	5.177215	3	10	0.5	0
1990	393	6.312977	3	8	1.25	0
1991	410	7.063415	4	7	0.2857143	0
1992	534	6.544944	3	16	0.4375	0
1993	539	7.187384	3	22	1.454545	0
1994	657	7.022831	2	53	3.264151	0
1995	783	7.366539	2	59	1.508475	0
1996	1,144	6.541958	2	130	2.569231	0
1997	1,333	7.042011	2	258	3.003876	0
1998	1,471	7.906186	3	513	4.081871	1
1999	2,029	7.648103	2	805	4.73913	1
2000	2,399	9.025427	3	1,253	6.261772	2
2001	1,391	16.20489	7	809	8.490729	4
2002	1,076	20.65149	10	494	12.58502	5
2003	995	23.02714	10	370	14.92703	7
2004	1,051	23.86965	11	341	17.74487	8
2005	1,029	24.90379	11	310	21.53871	9
2006	1,022	25.96771	11	352	21.41193	9
2007	966	26.89234	10	364	23.6456	8
2008	800	31.3475	13	221	20.83258	9
2009	619	37.02908	14	186	20.87097	8
2010	567	38.3157	15	178	18.85393	7
2011	343	47.7551	19	92	38.02174	15.5
Total VCs	**5,131**			**2,388**		

Source: Dow Jones VentureSource

Table 9: Venture capitalist experience and characteristics

The table shows regressions using a Cox proportional hazard model. The dependent variable is the hazard rate of IPO or trade sale exit. The unit of observation is the firm-year to reflect the possibility that the firm can potentially exit in any year. *Europe* is a dummy equal to one for European deals. *Has board date* is a dummy equal to one if the firm's board data is present. *VC board representation* is a dummy equal to one if the firm has at least one VC board member. *VC experience* is the difference between the log of one plus the number of active investments made by the venture capital organization prior to year t and the average in year t of the log of one plus the number of active investments made by all organizations prior to year t. *Partner experience* is the difference between the log of one plus the number of board seats in different VC-funded ventures prior to year t and the average in year t of the log of one plus the number of board seats in different VC-funded ventures by all partners prior to year t. *VC specialization* is a fraction of past active VC investments done in the same industry as the industry of the current investment. *Partner specialization* is the fraction of past board seats that were in the same industry as the industry of the current investment. Year fixed effects are controlled by respective dummies. Industry and stage classifications are reported in Table 2. Round fixed effects refer to the round number of financing when VC invested for the first time. Standard errors are in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Hazard for IPOs & Trade sales	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Europe	-0.226***	-0.178***	-0.492***	0.0325	0.0338	0.00179	0.0403
	(0.0227)	(0.0251)	(0.0527)	(0.0276)	(0.0276)	(0.0282)	(0.0285)
Has board data	0.213***						
	(0.0269)						
VC board representation				0.129***	0.109***	0.181***	0.105**
				(0.0410)	(0.0421)	(0.0414)	(0.0425)
VC experience				0.148***	0.139***		0.133***
				(0.00858)	(0.00975)		(0.0120)
Partner experience						0.116***	-0.00209
						(0.0149)	(0.0179)
VC specialization					0.0878**		0.0185
					(0.0410)		(0.0483)
Partner specialization						0.165***	0.110**
						(0.0368)	(0.0428)
Year, Industry, stage, and round	Yes	Yes	Yes	Yes	Yes	Yes	Yes
fixed effects							
Observations	273,212	215,175	58,037	215,175	215,175	215,175	215,175
Log likelihood	-119,700	-99,739	-14,839	-99,563	-99561	-99,623	-99,557
Chi squared	2,886	2,346	6,31.4	2,696	2,701	2,577	2,708
Number of deals	35,798	26,858	8,940	26,858	26,858	26,858	26,858

Source: Dow Jones VentureSource

Table 10: Venture capitalist experience and characteristics, part 2

The table shows regressions using a Cox proportional hazard model. The dependent variable is the hazard rate of IPO or trade sale exit. The unit of observation is the firm-year to reflect the possibility that the firm can potentially exit in any year. *Europe* is a dummy equal to one for European deals. *VC board representation* is a dummy equal to one if the firm has at least one VC board member. *VC experience* is the difference between the log of one plus the number of active investments made by the venture capital organization prior to year t and the average in year t of the log of one plus the number of active investments made by all organizations prior to year t. *Partner specialization* is a fraction of past board seats that were in the same industry as the industry of the current investment. *Founder experience* is a dummy equal to one if any of the firm's founders founded another business. *Data on previous venture* is a dummy equal to one if any of the firm's founders founded a VC-funded venture that is recorded by VentureSource. *Success on previous venture* is a dummy equal to one if a previously VC-funded venture was successful. *Preferred Shares* is a dummy equal to one if preferred shares were issued in the first VC financing round. *Syndicated* is a dummy equal to one if more than one VC organization invested in the first round. Year fixed effects are controlled by respective dummies. Industry and stage classifications are reported in Table 2. Round fixed effects refer to the round number of financing when VC invested for the first time. Standard errors are in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	IPOs & Trade sales	**IPOs & Trade sales**	**IPOs**	**IPOs**	**Trade sales**	**Trade sales**
Europe	0.0557**	0.136***	0.597***	0.768***	-0.167***	-0.114***
	(0.0279)	(0.0305)	(0.0599)	(0.0644)	(0.0305)	(0.0331)
VC board representation	0.104**	0.0727	-0.0115	-0.0158	0.218***	0.180***
	(0.0415)	(0.0451)	(0.0903)	(0.0999)	(0.0494)	(0.0535)
VC experience	0.130***	0.119***	0.184***	0.181***	0.0778***	0.0646***
	(0.00970)	(0.0105)	(0.0214)	(0.0232)	(0.0108)	(0.0117)
Partner specialization	0.111***	0.0775**	0.0565	0.0355	0.0456	0.00765
	(0.0335)	(0.0359)	(0.0651)	(0.0699)	(0.0397)	(0.0425)
Founder experience	0.154***	0.140***	0.419***	0.415***	-0.00743	-0.0211
	(0.0245)	(0.0263)	(0.0495)	(0.0531)	(0.0285)	(0.0304)
Data on previous venture	-0.176**	-0.185**	-0.549***	-0.530***	-0.107*	-0.0984
	(0.0705)	(0.0753)	(0.106)	(0.113)	(0.0601)	(0.0637)
Success on previous venture	0.122	0.135	0.727***	0.758***	0.164**	0.122
	(0.0769)	(0.0819)	(0.147)	(0.152)	(0.0732)	(0.0777)
Preferred Shares		0.404***		0.651***		0.273***
		(0.0303)		(0.0614)		(0.0322)
Syndicated		0.106***		0.00166		0.151***
		(0.0219)		(0.0457)		(0.0251)
Year, Industry, stage, and round	Yes	Yes	Yes	Yes	Yes	Yes
fixed effects						
Observations	215,175	188,471	212,158	185,539	212,158	185,539
Log likelihood	-99,537	-86,612	-22,909	-19,632	-75,905	-66,271
Chi squared	2,750	2,583	3,295	3,077	780.2	805.4
Number of deals	26,858	23,472	26,614	23,239	26,614	23,239

Source: Dow Jones VentureSource

Table 11: Country fixed effects

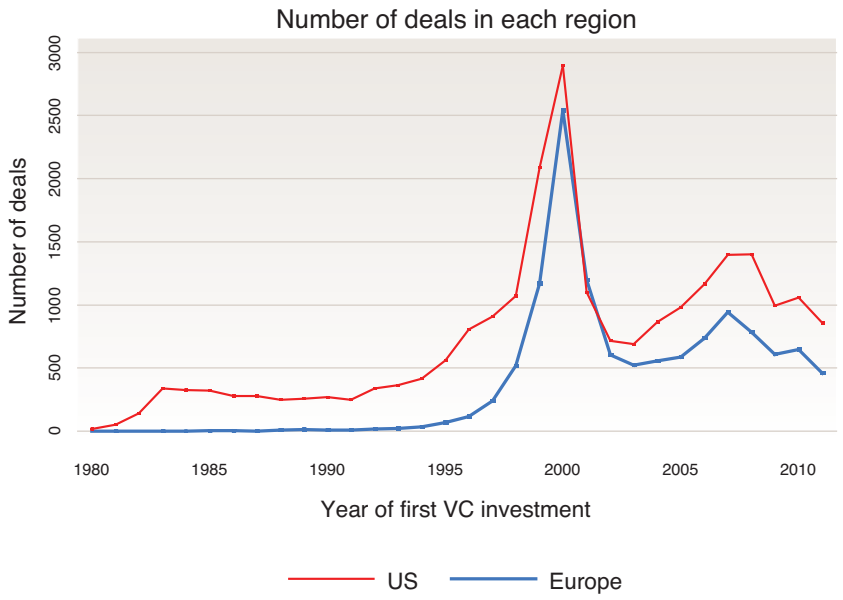
The table shows regressions using a Cox proportional hazard model. The dependent variable is the hazard rate of IPO or trade sale exit. The unit of observation is the firm-year to reflect the possibility that the firm can potentially exit in any year. "Corresponding specification" refers to the same regression using the European dummy instead of country fixed effects. We do not report coefficients and standard errors for explanatory variables other than country fixed effects, as these are virtually unchanged relative to the corresponding specifications. Year fixed effects are controlled by respective dummies. Industry and stage classifications are reported in Table 2. Round fixed effects refer to the round number of financing when VC invested for the first time. Standard errors are in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(7)
Corresponding specification	**IPOs & Trade sales**	**IPOs & Trade sales**	**IPOs & Trade sales**	**IPOs & Trade sales**	**IPOs**	**Trade Sales**
	Table 6:3	Table 7:1	Table 9:4	Table 10:2	Table 10:3	Table 10:5
European dummy from	*-0.265***	*-0.229***	*0.0325*	*0.136***	*0.597***	*-0.167***
corresponding specification	*(0.022)*	*(0.0228)*	*(0.0276)*	*(0.0305)*	*(0.0599)*	*(0.0305)*
Country fixed effects:						
Austria, Liechtenstein , Switzerland	-0.235***	-0.198**	0.0335	0.118	0.463**	-0.142
	(0.0884)	(0.0889)	(0.102)	(0.111)	(0.227)	(0.115)
Belgium , Luxembourg , Netherlands	-0.428***	-0.399***	-0.166*	-0.0586	0.334	-0.328***
	(0.0722)	(0.0725)	(0.0907)	(0.0958)	(0.207)	(0.0991)
Germany	-0.450***	-0.420***	-0.0697	-0.00828	0.906***	-0.402***
	(0.0463)	(0.0469)	(0.0586)	(0.0631)	(0.109)	(0.0689)
France, Monaco	-0.213***	-0.175***	0.0912*	0.210***	0.844***	-0.168***
	(0.0456)	(0.0459)	(0.0541)	(0.0569)	(0.114)	(0.0598)
Sweden	-0.227***	-0.188***	-0.0621	0.0818	0.360**	-0.183**
	(0.0599)	(0.0604)	(0.0676)	(0.0715)	(0.158)	(0.0737)
Denmark, Finland, Iceland , Norway	-0.161***	-0.121**	0.0427	0.141**	0.388**	-0.107
	(0.0543)	(0.0548)	(0.0632)	(0.0670)	(0.157)	(0.0675)
Italy, Malta, Portugal, Spain	-0.381***	-0.312***	-0.0503	0.111	0.665***	-0.304**
	(0.0858)	(0.0859)	(0.108)	(0.113)	(0.246)	(0.121)
Ireland, United Kingdom	-0.173***	-0.142***	0.128***	0.224***	0.494***	-0.0379
	(0.0357)	(0.0361)	(0.0409)	(0.0444)	(0.0953)	(0.0442)
Other	-0.325**	-0.255*	-0.000323	0.159	0.661*	-0.229
	(0.137)	(0.138)	(0.176)	(0.181)	(0.362)	(0.201)
Observations	273,212	262,138	215,175	185,539	212,158	212,158
Log likelihood	-119,713	-116,806	-99,554	-85,615	-22,899	-75,890
Chi squared	2,860	3,040	2,715	2,632	3,305	802.5
Number of deals	35,798	34,887	26,858	23,239	26,614	26,614

Source: Dow Jones VentureSource

Figure 1: Number of deals per year per region

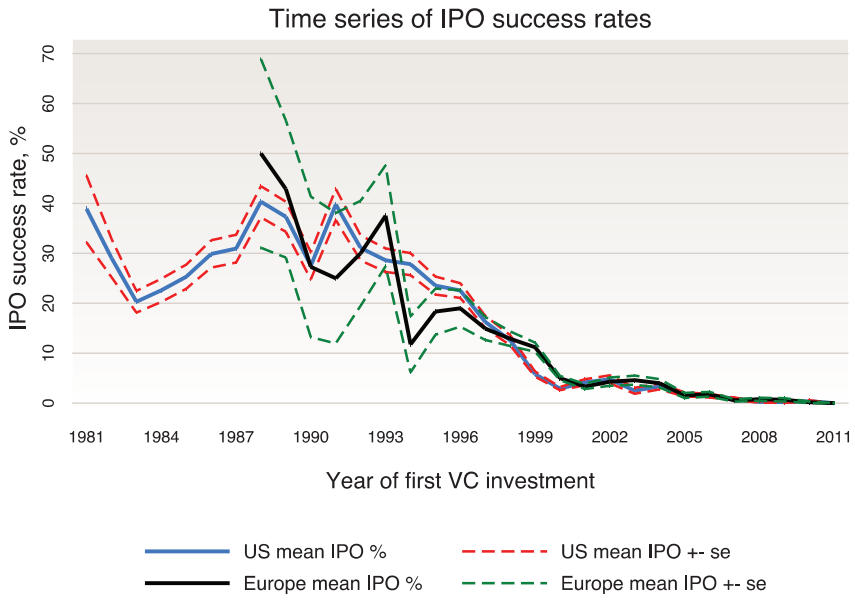
Figure 1 shows the number of venture deals over time and across regions covered in our sample.



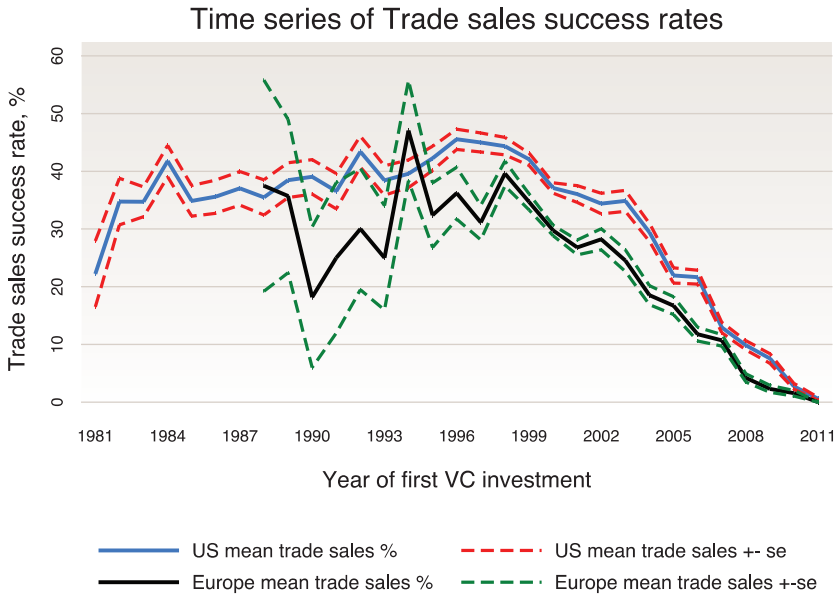
Source: Dow Jones VentureSource

Figure 2: IPO and Trade Sales success rates per region.

Figure 2 shows the time series of IPO and Trade sale exit rates across years of the first VC investment for the two regions.



Source: Dow Jones VentureSource

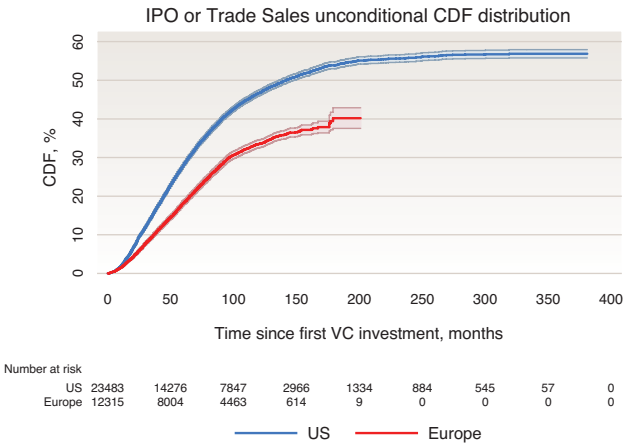


Source: Dow Jones VentureSource

Figure 3: Estimated cumulative density of exits per region

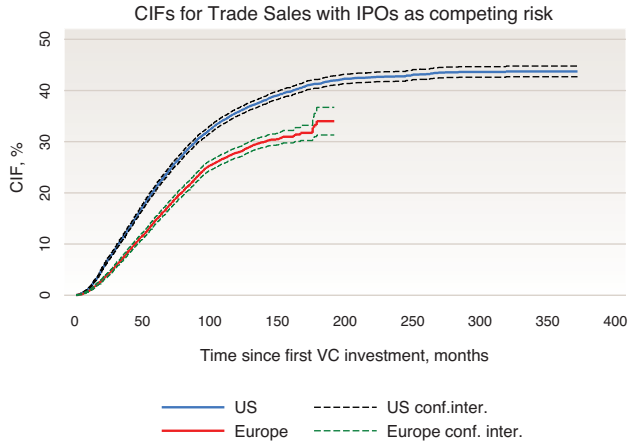
Figure 3a shows the Kaplan-Meier estimator of the cumulative density of exits (IPOs or trade sales) for the US (blue line) and Europe (red line). Below each graph the Number at risk table shows for different time periods the total number of deals that could potentially exit. Time period is in months from the time when the firm received the first round of VC financing. Confidence bands represent 95% confidence intervals of the Kaplan-Meier estimator. Figures 3b and 3c show the estimated cumulative incidence function for IPOs and trade sales, respectively. Cumulative incidence functions were computed treating the alternative exit route as a competing risk, i.e. they represent cumulative density functions for a particular exit route allowing for the existence of the alternative exit route. 95% confidence intervals are plotted as dotted lines. The unconditional estimated exit probability within 200 months from the first round of VC financing is 40% for Europe and 56% for the US.

Figure 3a



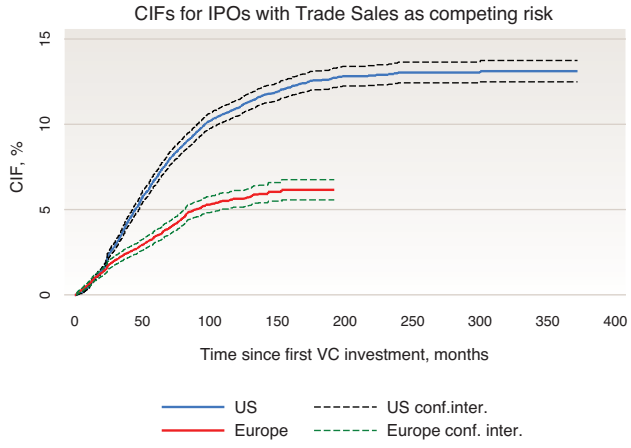
Source: Dow Jones VentureSource

Figure 3b



Source: Dow Jones VentureSource

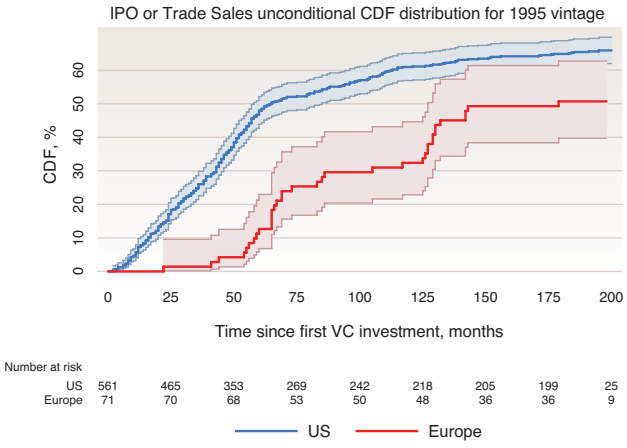
Figure 3c



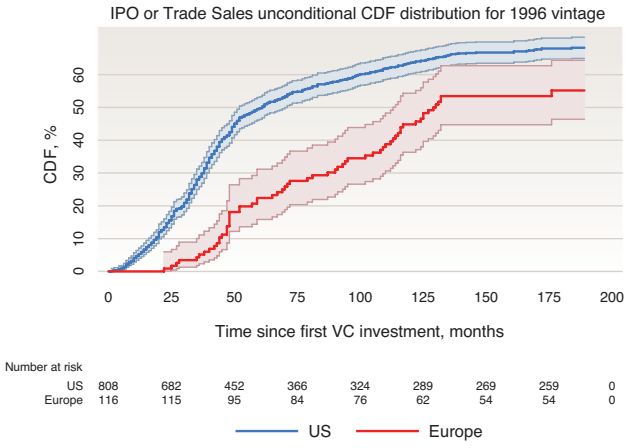
Source: Dow Jones VentureSource

Figure 4: Estimated cumulative density of exits per region per year

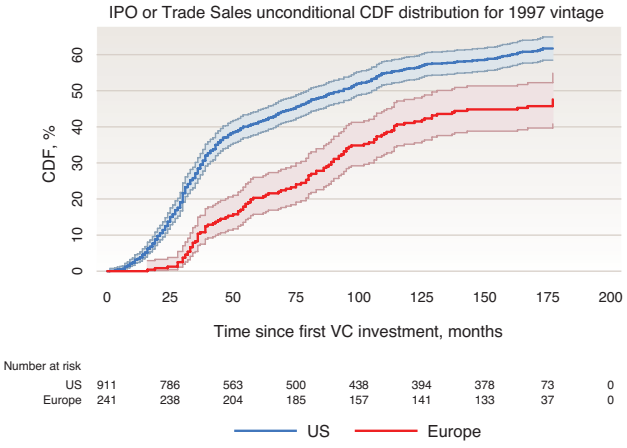
Figure 4 shows the Kaplan-Meier estimator of the cumulative density of exits (IPOs or trade sales) for the US (blue line) and Europe (red line), for each vintage year from 1996 to 2006. 95% confidence intervals are also plotted.



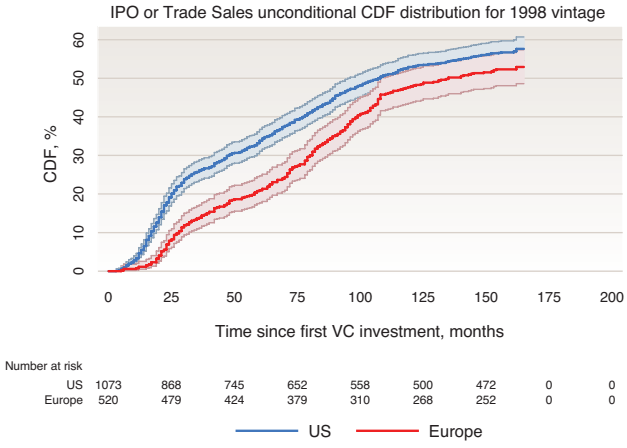
Source: Dow Jones VentureSource



Source: Dow Jones VentureSource



Source: Dow Jones VentureSource



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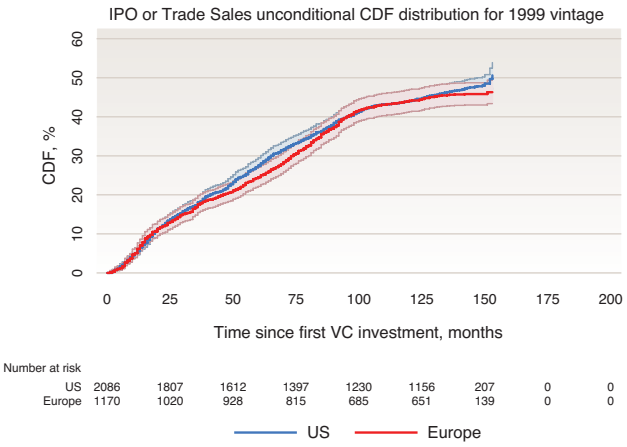

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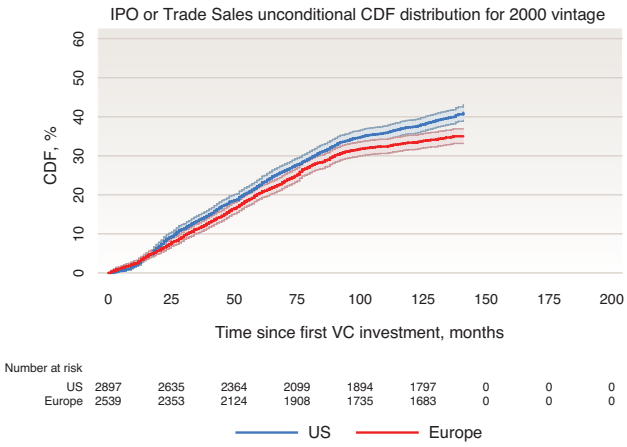
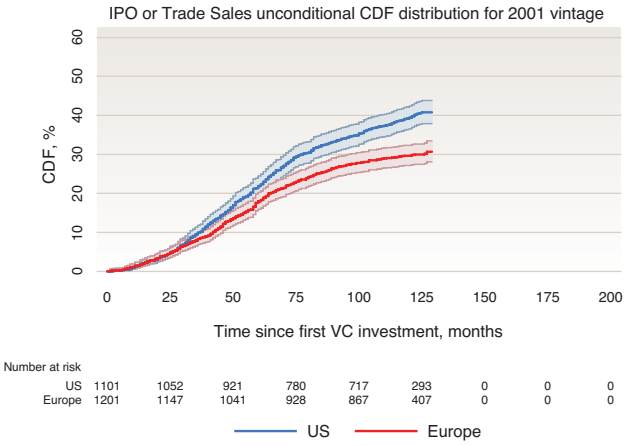
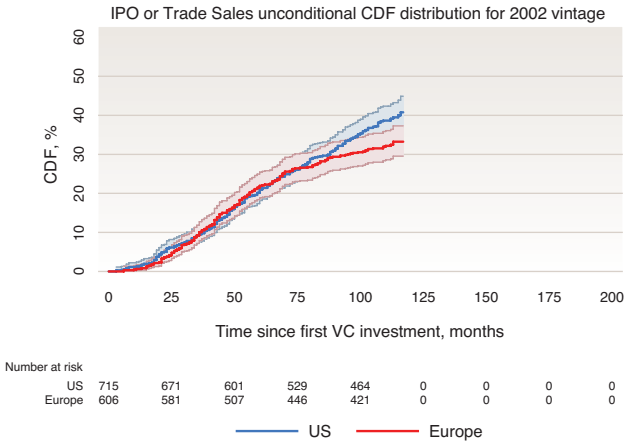


Source: Dow Jones VentureSource

Figure 4, continued: Estimated cumulative density of exits per region per year



Source: Dow Jones VentureSource



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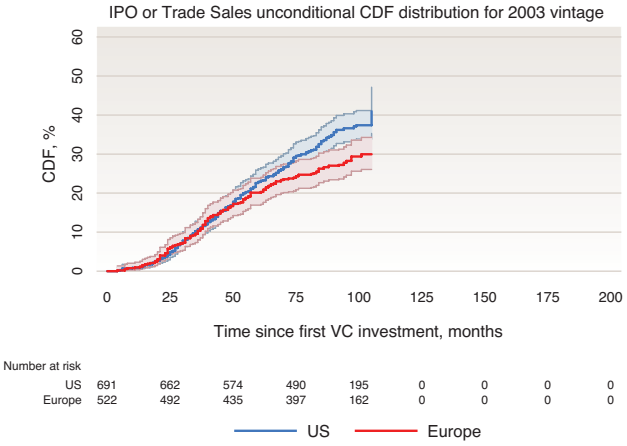

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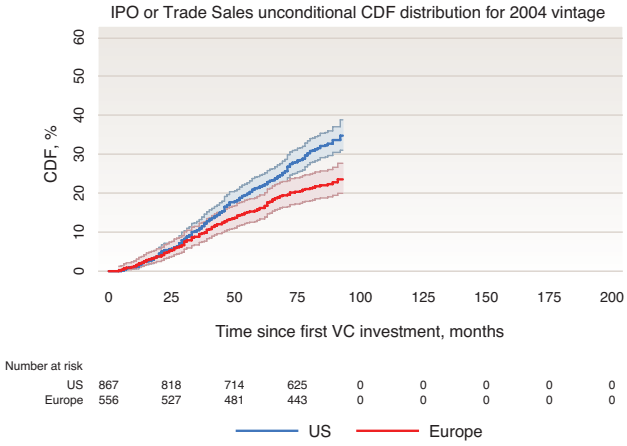

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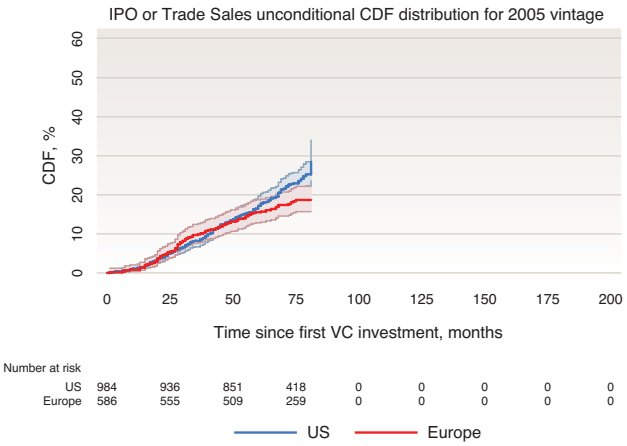

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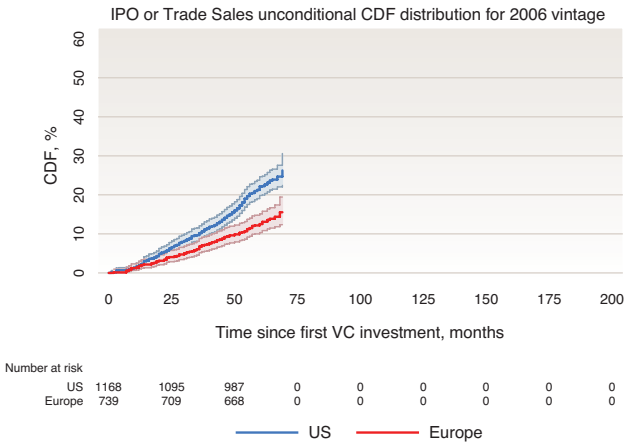
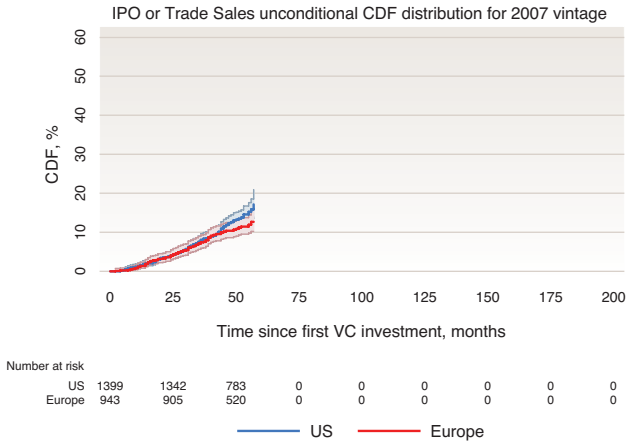


Source: Dow Jones VentureSource

Figure 4, continued: Estimated cumulative density of exits per region per year



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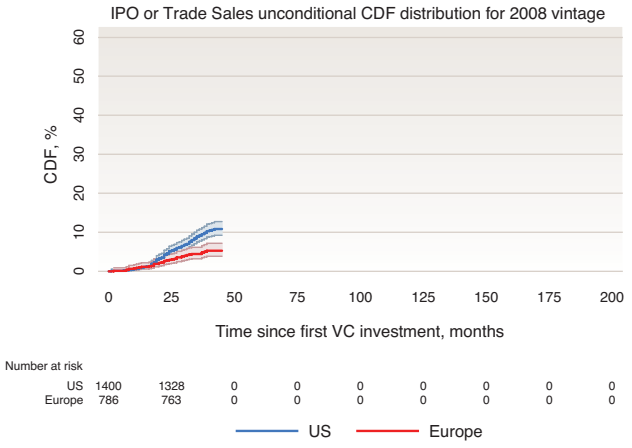

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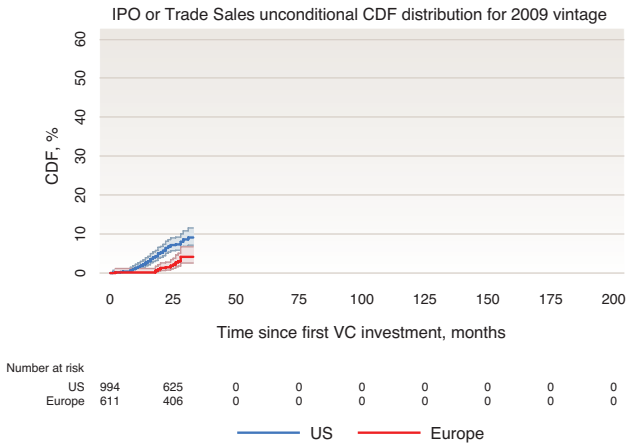

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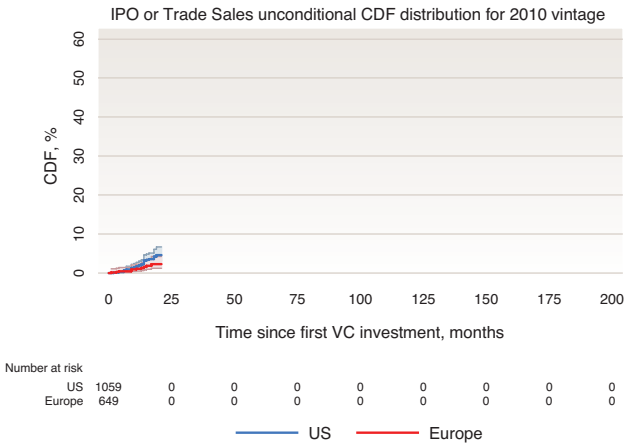
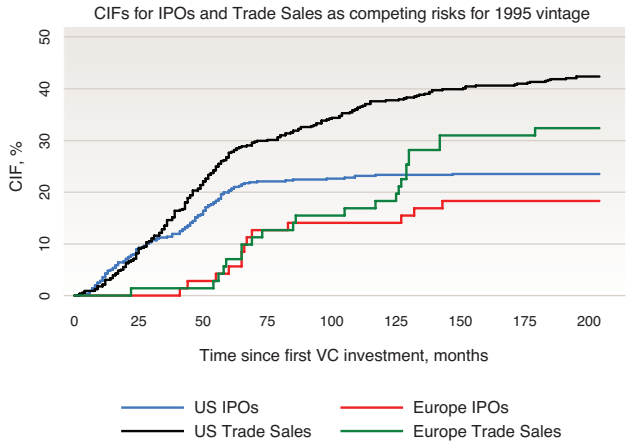


Source: Dow Jones VentureSource

Figure 5: Estimated cumulative density of exits per region per year

Figure 5 shows the estimated cumulative incidence function for IPOs and trade sales for both regions separately. Cumulative incidence functions were computed treating the alternative exit route as a competing risk, i.e. they represent cumulative density functions for a particular exit route allowing for the existence of the alternative exit route.



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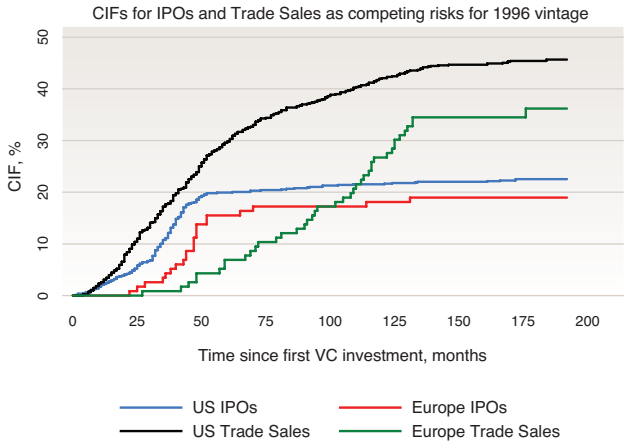
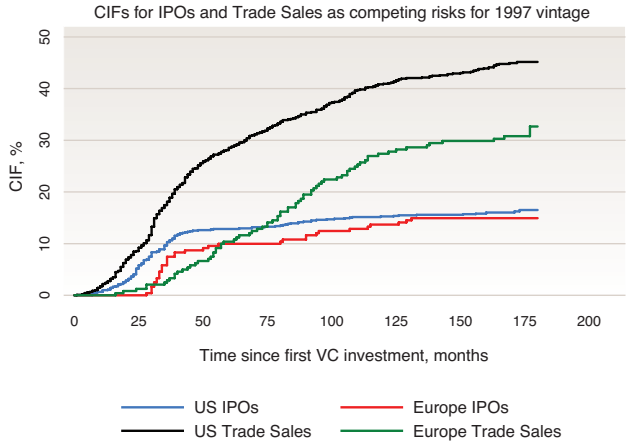


Source: Dow Jones VentureSource



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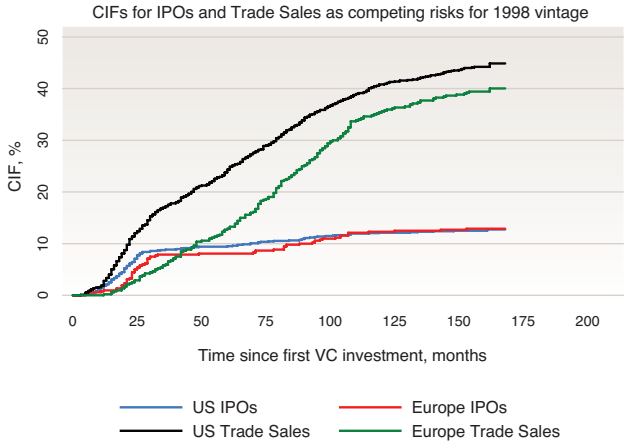

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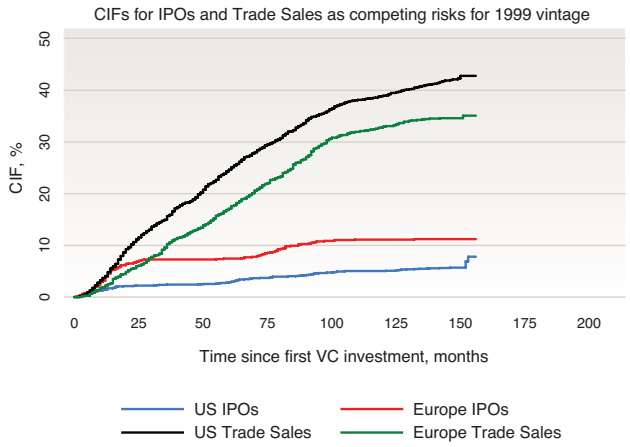

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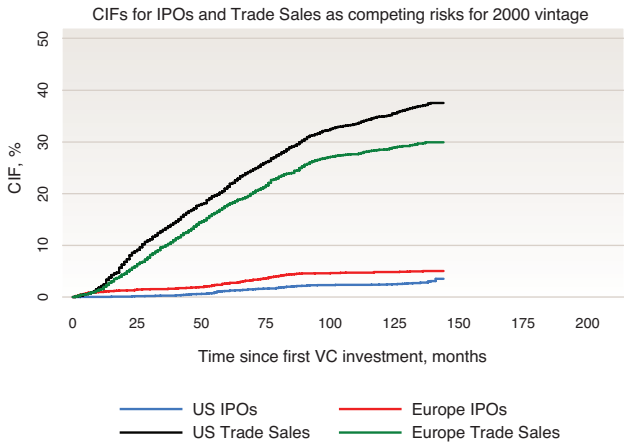
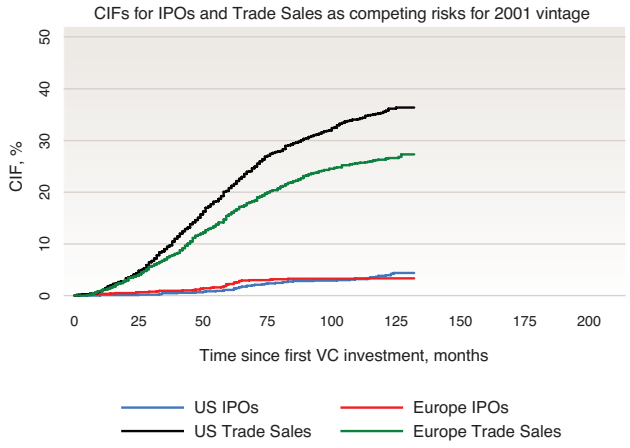


Source: Dow Jones VentureSource

Figure 5 continued: Estimated cumulative density of exits per region per year



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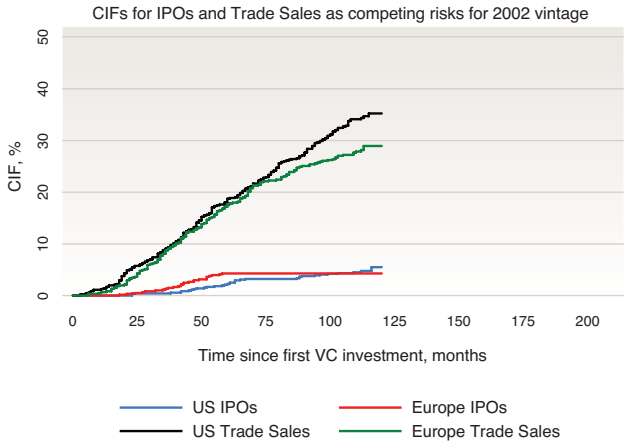

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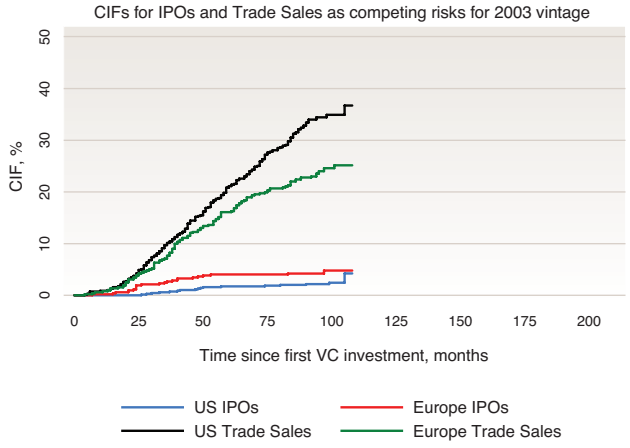

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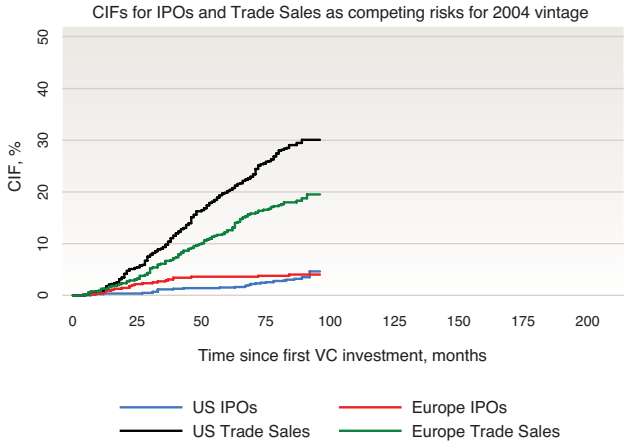

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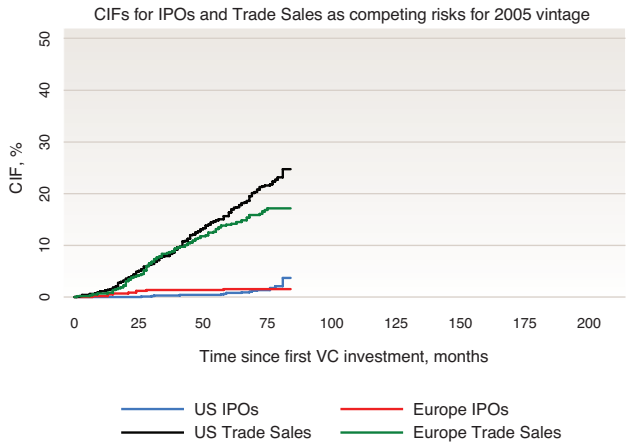

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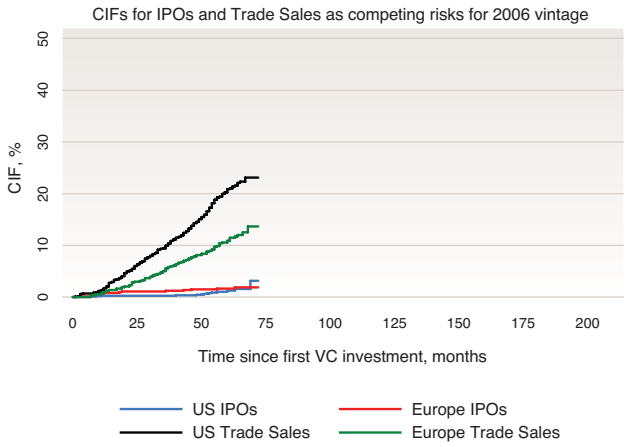
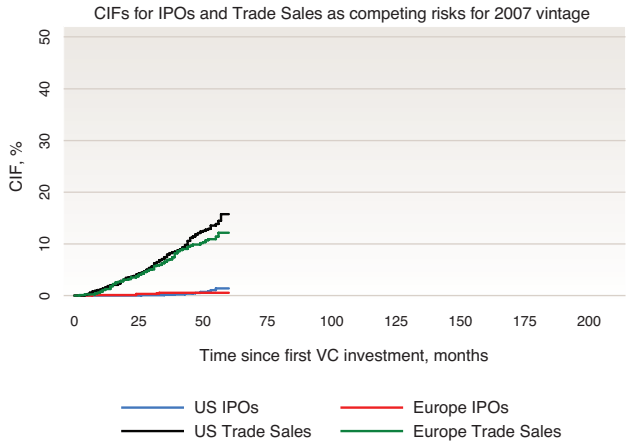


Source: Dow Jones VentureSource

Figure 5 continued: Estimated cumulative density of exits per region per year



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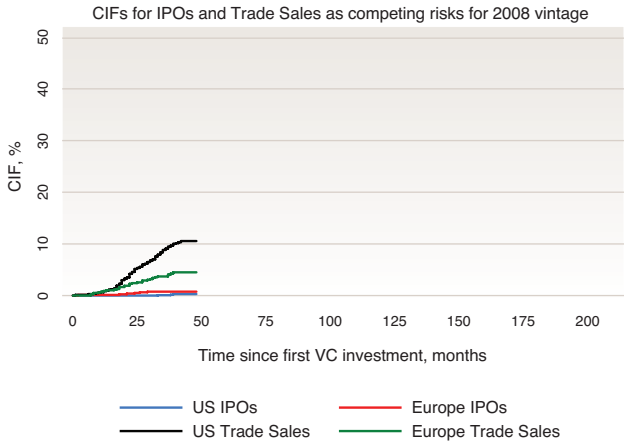

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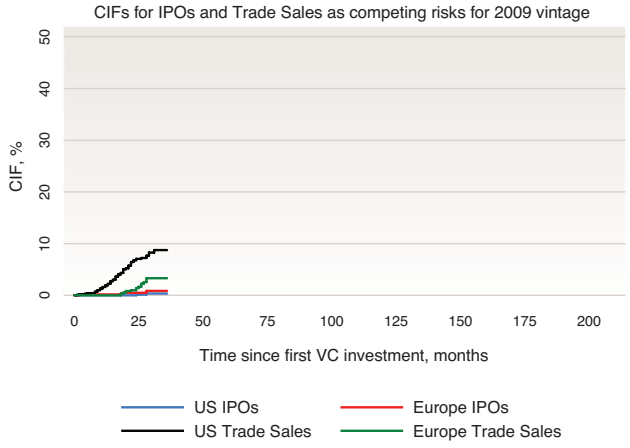

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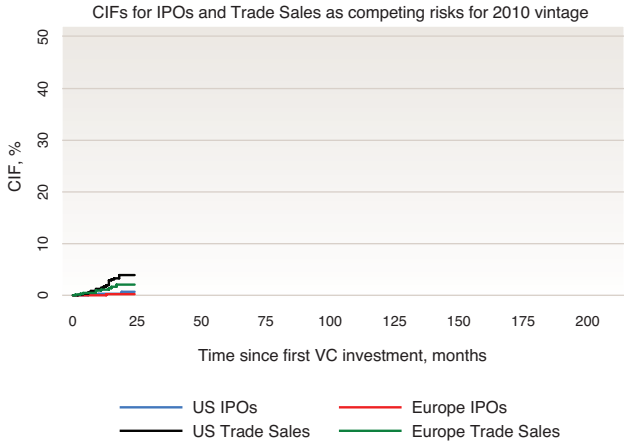
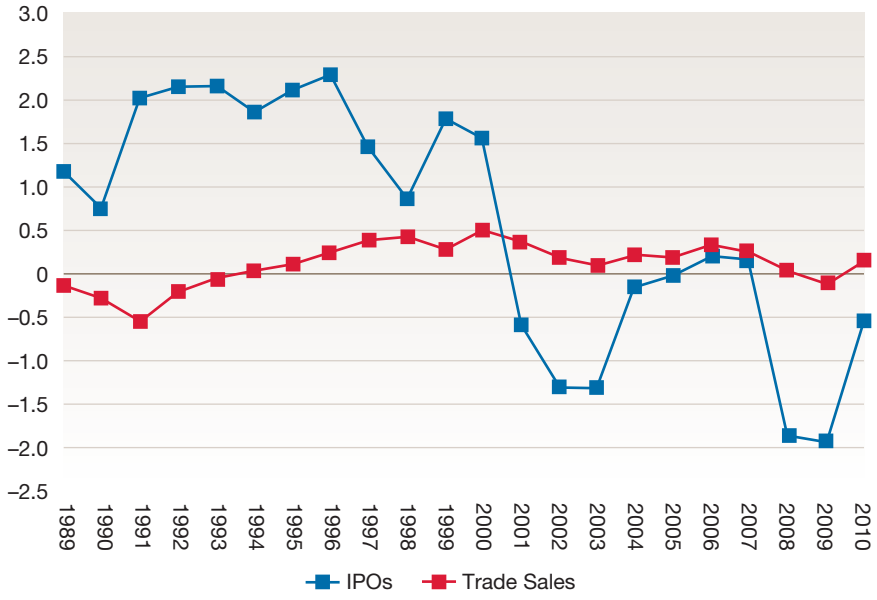


Source: Dow Jones VentureSource

Figure 6: Calendar year dummies for IPO and Trade sale hazard rates

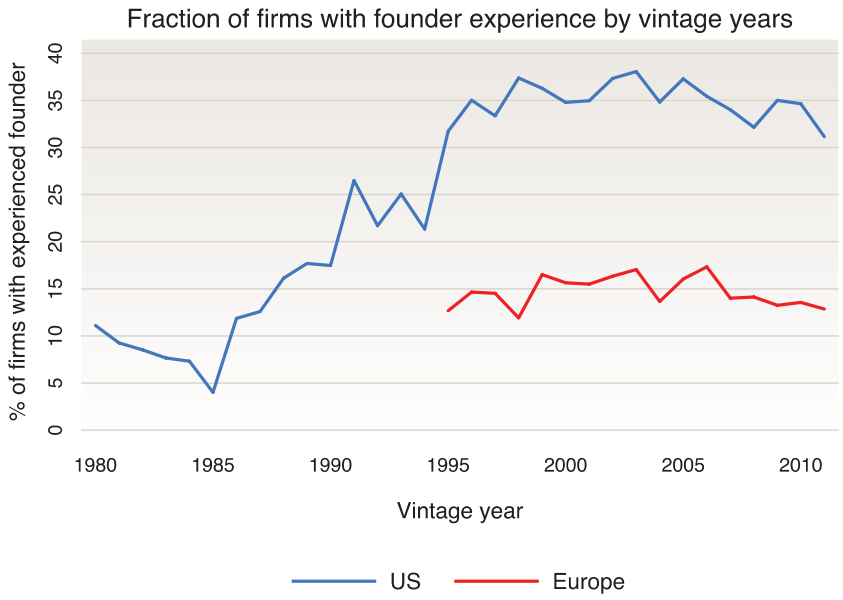
Figure 6 shows the calendar year dummy coefficients from Specifications (5) and (8) in Table 6.



Source: Dow Jones VentureSource

Figure 7: Serial entrepreneurship

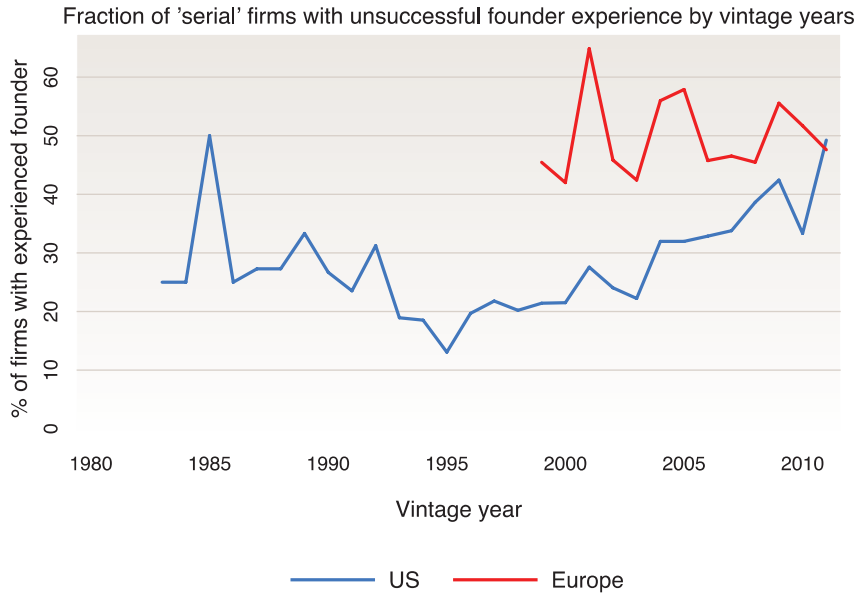
Figure 7 shows the fraction out of all firms receiving their first round of VC financing in year t that has at least one founder with previous entrepreneurial experience. Entrepreneurial experience is identified by information in VentureSource about the background of entrepreneurs.



Source: Dow Jones VentureSource

Figure 8: Stigma of failure

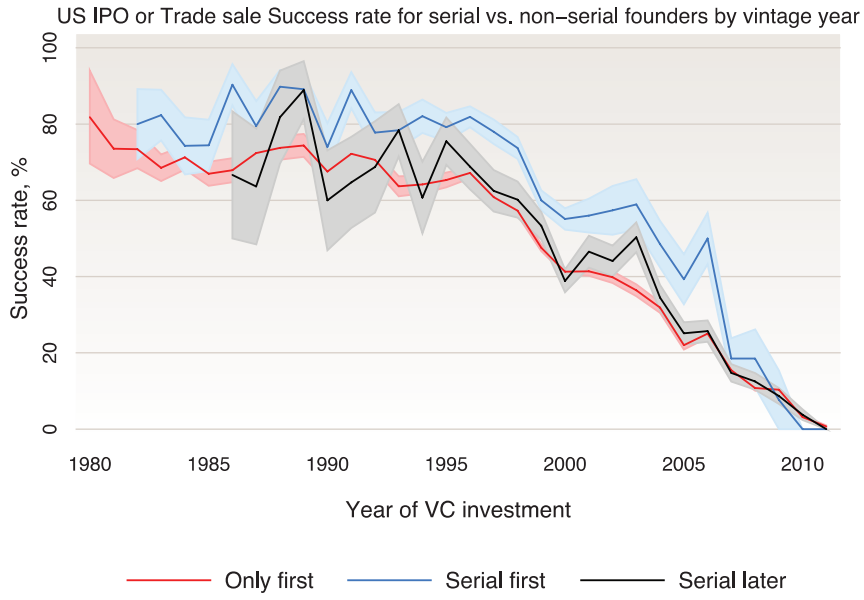
Figure 8 shows by the first year of VC financing the fraction of firms with founder(s) who founded a VC-backed venture before without successful exit (IPO or Trade Sale) out of all firms with at least one founder who founded a VC-backed venture before.



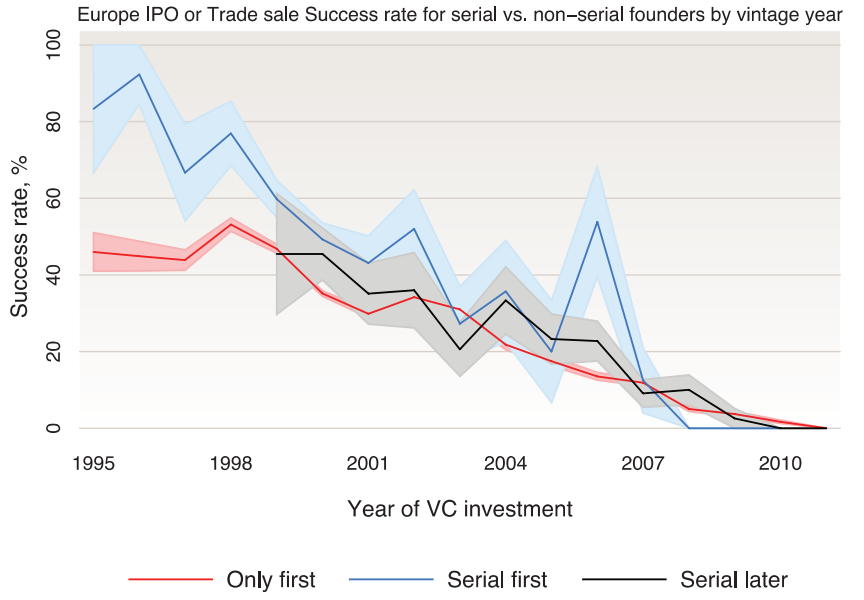
Source: Dow Jones VentureSource

Figure 9: Success of serial entrepreneurs

Figure 9 shows for the two regions time series of success rates (IPO or Trade Sale) by year of first VC financing for different types of firms. The red line represents firms with no founders who founded a VC-backed venture before and who never founded another VC-backed venture in the future. The blue line represents firms with no founders who founded a VC-backed venture before but at least one of the founders founded another VC-backed venture in the future. The black line represents firms with at least one founder who founded VC-backed venture before.



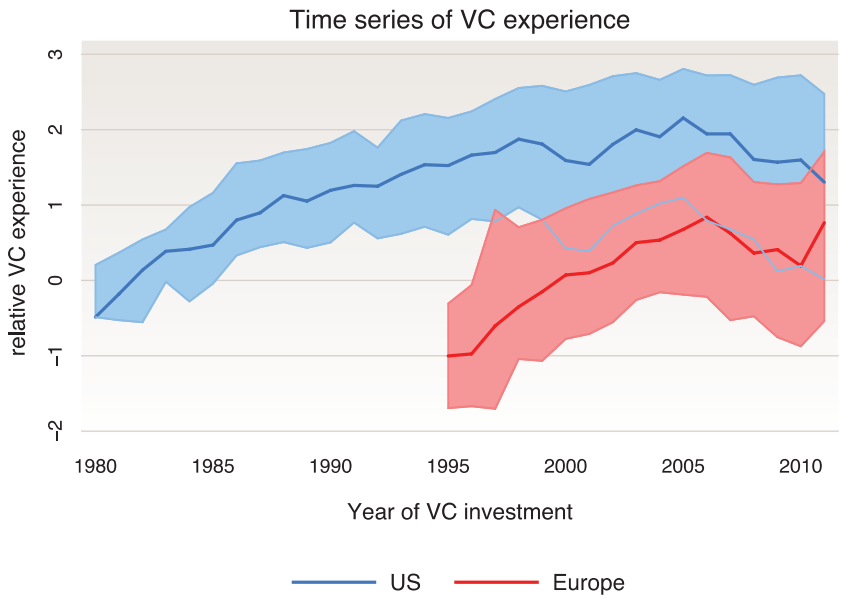
Source: Dow Jones VentureSource



Source: Dow Jones VentureSource

Figure 10: Experience of venture capitalists in US vs. Europe

Figure 10 shows the time series of VC experience by year of first VC financing. VC experience is the difference between the log of one plus the number of active investments made by a venture capital organization prior to year t and the average in year t of the log of one plus the number of active investments made by all organizations prior to year t.



Source: Dow Jones VentureSource

BVCA

The British Private Equity & Venture Capital Association (BVCA) is the industry body and public policy advocate for the private equity and venture capital industry in the UK. We drive forward the case for private equity and venture capital as the engine room of entrepreneurship and economic growth. As our members support growing businesses, so we support the collective impact of their investment by demonstrating its value to Government, the media and society at large.

More than 500 firms make up the BVCA membership and this number continues to grow. We represent 230 private equity, midmarket and venture capital firms with an accumulated total of over £200 billion funds under management; as well as nearly 300 professional advisory firms, including legal, accounting, regulatory and tax advisers, corporate financiers, due diligence professionals, environmental advisers, transaction services providers, and placement agents. Additional members include international investors and funds-of-funds, secondary purchasers, academics and fellow national private equity and venture capital associations globally.

We provide our members and the wider industry community with a comprehensive portfolio of services and best practice standards including leading professional development courses, research, networking opportunities, proprietary publications and topical conferences, all designed to ensure our members and their teams have access to the broad range of skills and tools required to drive their firms and the industry forward.

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Dow Jones VentureSource helps venture capitalists, corporate development executives, investment bankers and service providers find deal and partnership opportunities, perform comprehensive due diligence and examine trends in venture capital investment, fund-raising and liquidity. It provides accurate, comprehensive data on venture-backed companies including their investors and executives in every region, industry and stage of development throughout the world.

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