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Why local banking market concentration hinders IPOs and how it can work to issuers' advantage

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A B S T R A C T

General sample evidence conceals the influence of banking market structure on a fraction of IPO issuers with limited financing options: small non-venture-capital-backed firms (SNVC). Using U.S. county-level data, we reveal that concentrated banking markets contract IPO activity, as they cause SNVCs to incur high underpricing at listing. However, when the size of the local banks is small, both the time to IPO and underpricing decrease. Our evidence infers that, unless banks are organizationally capable of tapping into soft information, they generally use market power for rent extraction, which has important spillover effects on the IPO market.

1. Introduction

We produce the first study to associate banking market structure with the IPO decision. Although access to public equity markets might appear as a panacea to their capital constraints, prospective issuers have to secure financing for that level of growth which can warrant an IPO, and the terms attached to pre-IPO financing are known to influence both the time and amount of IPO proceeds (Gompers, 1996).

Because of non-stationarity in the IPO underpricing and number of firms going public (Loughran and Ritter, 2004), we assemble a comprehensive dataset of 1,780 U.S. IPOs starting in 1998, the beginning of the dot-com bubble with the frenetic issuing activity and astronomical levels of underpricing, and ending in 2017. With an IPO volume and time span that are large enough to dismantle concerns due to cyclicality, our sample confirms that more than half of the issuers fulfil the threshold of 500 employees or less predominantly used in literature to classify firms into the small business taxonomy. Here, the prime source of finance is bank credit (Berger and Udell, 2002), aiming to transcend information opacity by feeding *soft information* into the lending decision, i.e. non-quantifiable aspects of the bank–borrower relationship. By its nature, soft information is easier to transmit within less hierarchical organizations, such as small banks (Berger et al., 2005).

The U.S. banking market is increasingly concentrated (Corbae and Erasmo, 2020), offering even fewer options. How concentration alters prospective issuers' framing of an IPO is ambivalent, with the traditional banking market structure theories offering competing predictions. The *market power hypothesis* suggests that a concentrated market limits the supply of credit and raises its cost (Ryan et al.,

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2014). The *information hypothesis* instead suggests that concentration incentivizes banks to invest in the relationship, and share any surpluses on an intertemporal basis, i.e. subsidize advantageous contract terms initially to recoup the losses at a later stage (Petersen and Rajan, 1995). Thus, while the former hypothesis predicts onerous financing terms and uncertainty for prospective issuers, the latter hypothesis views a nurturing banking environment that supports firm growth until the IPO.

The empirical analysis leverages county-level heterogeneity to convey the novel insight that concentrated banking markets give rise to significantly fewer IPOs. We attribute the observed heterogeneity to small non-venture-capital-backed firms (SNVC), a fraction of issuers with limited financing options, for whom listing comes with heavy underpricing. Although this result is consistent with the market power hypothesis, a plausible alternative interpretation could invoke the beneficial effects of venture capital (VC). The latter affiliation is known to: 1) certify new offerings, as VC firms generally safeguard their reputation by avoiding issuers of dubious quality (Megginson and Weiss, 1991); 2) reinforce the corporate governance of portfolio firms via active monitoring (Barry et al., 1990); and 3) capitalize on their experience from being repeat players at the IPO game to attain better valuation outcomes for new equities (Lerner, 1994)[1]. In addition to showing that our results survive when controlling for VC, we add further confidence in the link between IPO underpricing and banking market concentration via a quantile regression framework, indicating that HHI fails to generate a systematic association with IPO underpricing in the lower quantiles of the underpricing distribution.

There is an important twist to our results: when the available banks are small, SNVCs leave less money on the table and take a shorter time to IPO. From this it follows that unless banks are structurally fit to operationalize soft information, they, on average, use market power to dominate their relationships with small business customers. Although this evidence is new to the literature, some parallels can be drawn. Notably, a new plausible interpretation emerges as to why IPO underpricing tends to be lower in rural areas (Nielsson and Wójcik, 2016), considering that these usually are intensive in small firm-small bank clusters.

Our original contribution is to establish banking market structure as a barometer of the IPO activity for a populous category of issuers. In proving the *small firm-small bank* arrangement conducive to the going-public process, we pinpoint the market structure which can mitigate underpricing for the cross-section of issuers, not only for those with connections to the main IPO actors (e.g. Schenone, 2004). Thus, our study offers a viable direction forward in light of rising bank concentration and a timely complement to Liberti and Petersen's (2019) theoretical conjectures on the salience of soft information.

2. Data and methodology

We retrieve the population of U.S. IPOs for the period 1998-2017 from SDC. Accounting and stock price data come from Compustat and CRSP, respectively. In our sampling (detailed in Appendix A), the standard filters of the IPO literature apply. Specifically, we exclude financial firms, limited partnerships, reverse LBOs, spinoffs, foreign issuers, and funds. In addition, we discard IPOs with an offer price less than \$5. The latter filter, common in previous research on small business IPOs (e.g., Bradley et al. 2006; Barlett et al. 2017), is aligned with the centrality of VC in our research design, as the likelihood of VC-backing is known to substantially decline below this price threshold (Bradley et al., 2006). Our final sample consists of 1,780 IPO issuers, of which 918 are small (<500 employees).

For bank concentration, we use issuers' address of headquarters and collect data on local bank deposits from FDIC. Two concentration proxies are developed. The first is the county-level Herfindahl–Hirschman index (HHI), measured as the sum of squared deposit market shares: $HHI_C = \sum_i [MS_{i,c}]^2$where $MS_{i,c}= \frac{Deposit\ of\ bank\ i\ in\ county\ c}{\sum_{i=1}^{n} Deposit\ of\ bank\ i\ in\ county\ c}$ is the market share of bank $i$in county c.

The second proxy, *adjusted HHI*, accounts for bank size and is novel to the literature. By construction, this measure is large in counties with predominantly small (local) banks (see also Appendix B):

$$Adjusted\ HHIC = \sum_i [CS_{i,c} \times MS_{i,c}]^2,$$

where MS is defined as above and $CS_{i,c}=\frac{Deposit\ of\ bank\ i\ in\ county\ c}{Total\ deposit\ of\ bank\ i\ nationwide}$ is the county share of bank i in county c.

For the analysis of the relation of the above measures with *Underpricing* (first aftermarket close minus the offer price divided by the offer price) and *Time to IPO* (number of years elapsing from the firm's foundation[2]), we use the OLS and accelerated failure time (AFT) methods, respectively, to estimate the following equation:

$$\begin{aligned}&\text{Underpricing}_i/\text{Time to IPO}_i = \beta_0 + \beta_1\,\text{HHI}_i + \beta_2\text{Adjusted HHI}_i + \beta_3\text{Log}(\text{Sales})_i + \beta_4\text{Top-tier underwriter}_i + \\ &\beta_5\text{Overhang}_I + \beta_6\text{Technology}_i + \beta_7\text{Internet}_i + \beta_8\text{Dotcom period}_i + \beta_9\text{Positive revision}_i + \beta_{10}\text{NASDAQ}_i + \\ &\beta_{11}\text{Market retrun}_i + \text{Industry dummies} + \text{Year dummies} + \varepsilon_i\end{aligned} \tag{1}$$

The control variables closely follow prior studies (e.g., Loughran and Ritter, 2004): *Sales* (in millions of dollars) correspond to the year preceding the IPO; *Overhang* is the shares retained over the IPO shares; *Market return* is the compounded daily return on the value-weighted CRSP index over the 30 trading days prior to listing; *Top-tier underwriter* equals 1 for underwriters with the highest

[1] For completeness, we note that this literature also provides counterarguments suggesting a dark side of VC, which serves to aggravate IPO underpricing. Two leading examples are VC firms receiving side benefits from underwriters (Loughran and Ritter, 2004) or engaging in grandstanding (Gompers, 1996).

[2] We thank Jay Ritter for these data: https://site.warrington.ufl.edu/ritter/ipo-data/

Table 1
IPO activity by banking market structure.

	Competitive Counties (N=136)		Concentrated Counties (N=164)		Difference
	Mean	Std. Dev.	Mean	Std. Dev.	
IPOs per county	10.286	1.964	4.799	0.909	5.488***
Proportion of small firm IPOs	64.80%	3.11%	53.92%	3.71%	10.88%**

Competitive (concentrated) counties have HHI below (above) the mean of 0.138.

Table 2
Descriptive statistics.

All-Small Firms (N=918)	Mean	Std. Dev.	Median
Underpricing	0.296	0.594	0.123
HHI	0.138	0.072	0.118
Adjusted HHI	0.020	0.044	0.009
Sales	2.378	1.780	2.565
Top-tier underwriter	0.528	0.499	1
Overhang	3.734	5.344	3.036
Technology	0.439	0.496	0
Internet	0.136	0.343	0
Dotcom period	0.355	0.479	0
Positive revision	0.288	0.453	0
NASDAQ	0.801	0.400	1
Market return	0.001	0.001	0.001

All variables are defined in Section 2.

prestige ranking[2]. Further dichotomous variables indicate the sector *(Technology, Internet),* stock exchange (*NASDAQ*), overheated market of 1998-2000 (*Dotcom period*), and offer price exceeding the mid-point of the filing range (*Positive revision*).

3. Empirical results

Table 1 compares IPO activity by local banking market structure. The comparison is made between 136 counties with competitive markets (HHI< mean HHI of 0.138) and 164 counties with concentrated markets (HHI >0.138). We find that the average number of IPOs decreases from 10.286 in competitive counties to 4.799 in concentrated counties, with the proportion of small firm IPOs subsiding from 64.80% to 53.92%. This empirical observation justifies our focus on small firms, as the type of issuers most sensitive to local banking conditions[3]. Table 2 reports the descriptive statistics.

Allowing for heterogeneity in small issuers' demand for bank financing, we further distinguish based on VC occurrence and present separate evidence from each sample on the relation between concentration and the outcome variables of *underpricing* (Table 3, Columns 1-5) and *time to IPO* (Table 3, Columns 6-10).

For SNVCs, a significantly ($p<0.05$) positive coefficient on *HHI* (Column 2) confirms the adverse effect of banking concentration on IPO underpricing[4]. The augmented specification (Column 3) corroborates the robustness of this result, while yielding a strongly ($p<0.05$) negative coefficient on *adjusted HHI*. Together, these results suggest that, in concentrated markets, SNVC IPOs are bound to incur high underpricing unless the available banks are small, which we interpret as a testament to the latter institutions' ability to operationalize soft information. Consistent with this interpretation, *adjusted HHI* negatively relates to time to IPO (Column 8).

Issuers using VC depend less on bank credit, and this reflects on the respective underpricing models (Columns 4-5), wherein the concentration variables generate insignificant results. Notably, in the time to IPO model (Column 10), the coefficient on *adjusted HHI* remains of high statistical significance ($p<0.01$), although the magnitude is about 4.7 times smaller than in the SNVC sample.

As noted in the introduction, the higher IPO underpricing of SNVCs could simply capture the absence of well-known VC effects, such as certification and rigorous monitoring. In Table 4, we investigate and rule out this possibility in two ways. First, we augment our baseline specification by the inclusion of a *VC* dummy, a variable which fails to generate statistical significance but leaves the effect of *HHI* unaffected. Second, we apply quantile estimation and show that *HHI*, statistically insignificant at the lower tertile of the underpricing distribution, attains significance ($p<0.05$) at the upper tertile (as it does in the OLS regression).

[3] Other environmental factors are also possible to contribute to the observed differences in IPO volume. For example, the population imbalance among counties combined with the intuition that banking concentration tends to prevail in non-metropolitan areas, where there is generally less business activity.

[4] Available upon request, our results become insignificant when using all 1,780 IPOs or state-level HHI data. However, this is unsurprising given the variety of financing options available to larger firms and the multitude of counties within each state (on average 62, with Texas having the highest number of 254 counties). Confirming the importance of the local banking market, the U.S. National Survey of Small Business Finance reports that half of the small firms borrow from banks within 3 miles of their headquarters and 90% from banks within 25 miles (Berger et al., 2007).

Table 3
Banking concentration, underpricing, and time to IPO.

	OLS *Dependent variable: Underpricing*					AFT *Dependent variable: Time to IPO*				
	All-Small	SNVC		Small-VC		All-Small	SNVC		Small-VC	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
HHI	0.442**	0.712**	1.060**	0.124	0.168	-0.067	-0.499	-0.598	0.306	0.256
	(0.222)	(0.348)	(0.488)	(0.327)	(0.346)	(0.341)	(0.496)	(0.490)	(0.434)	(0.438)
Adjusted HHI			-0.966**		-0.269			-0.399***		-0.085***
			(0.481)		(0.701)			(0.072)		(0.020)
Log(Sales)	-0.024*	-0.025	-0.024	-0.033*	-0.033*	0.200***	0.228***	0.231***	0.181***	0.182***
	(0.013)	(0.022)	(0.022)	(0.018)	(0.018)	(0.020)	(0.043)	(0.043)	(0.020)	(0.020)
Top-tier underwriter	0.156***	0.201**	0.200**	0.079*	0.079*	-0.194***	-0.228**	-0.249**	-0.086*	-0.080*
	(0.037)	(0.080)	(0.079)	(0.040)	(0.040)	(0.047)	(0.116)	(0.114)	(0.048)	(0.048)
Overhang	0.008	0.001	0.001	0.075***	0.075***	-0.007**	-0.000	-0.000	-0.074***	-0.075***
	(0.006)	(0.002)	(0.002)	(0.015)	(0.015)	(0.003)	(0.005)	(0.005)	(0.012)	(0.012)
Technology	0.030	0.271**	0.267**	-0.080	-0.081	0.013	-0.174	-0.190	0.048	0.050
	(0.102)	(0.119)	(0.118)	(0.145)	(0.145)	(0.085)	(0.242)	(0.240)	(0.074)	(0.073)
Internet	0.144	0.233	0.236	0.055	0.055	-0.211***	-0.356**	-0.361**	-0.139**	-0.138**
	(0.094)	(0.228)	(0.226)	(0.103)	(0.104)	(0.067)	(0.182)	(0.180)	(0.070)	(0.070)
Dotcom period	0.214**	0.294	0.320	0.005	0.004	-0.575***	-0.680**	-0.683**	-0.498***	-0.503***
	(0.101)	(0.192)	(0.195)	(0.082)	(0.082)	(0.138)	(0.269)	(0.267)	(0.138)	(0.138)
Positive revision	0.275***	0.134	0.129	0.276***	0.276***	-0.110**	-0.128	-0.135	-0.093*	-0.099*
	(0.046)	(0.091)	(0.091)	(0.051)	(0.051)	(0.053)	(0.131)	(0.129)	(0.053)	(0.053)
NASDAQ	0.105**	0.120*	0.120*	0.093	0.093	0.064	0.221	0.249*	-0.138*	-0.146**
	(0.041)	(0.067)	(0.067)	(0.057)	(0.057)	(0.077)	(0.139)	(0.135)	(0.075)	(0.074)
Market return	39.409**	46.590	48.337	31.788*	31.835*	7.716	32.840	31.739	-2.088	-2.063
	(16.290)	(35.759)	(36.017)	(17.685)	(17.712)	(16.560)	(41.549)	(41.001)	(17.291)	(17.291)
Constant	-0.316***	-0.331***	-0.309***	-0.146	-0.150	0.443	0.486	0.506	0.958***	0.953***
	(0.090)	(0.126)	(0.105)	(0.146)	(0.146)	(0.784)	(0.425)	(0.413)	(0.177)	(0.178)
Observations	918	340	340	578	578	895	319	319	576	576
R-squared	0.304	0.236	0.243	0.414	0.414					

The robust standard errors are in parentheses.***,**,* indicate significance at the 1%, 5%, and 10% levels, respectively

Table 4
IPO underpricing, VC dummy, and quantile regression.

Dependent variable: Underpricing	OLS All-Small	Quantile regression 33th Quantile	 67th Quantile
HHI	0.443**	0.085	0.290**
	(0.219)	(0.109)	(0.121)
VC	0.000		
	(0.048)		
Control variables	Included	Included	Included
Constant	-0.316***	-0.277***	-0.300***
	(0.091)	(0.083)	(0.104)
Observations	918		
R-squared	0.305		

The robust standard errors are in parentheses. ***,**,* indicate significance at the 1%, 5%, and 10% levels, respectively

In a final robustness exercise, we also include the 43 SNVC IPOs with offer prices below $5. Using this expanded sample, we rerun the underpricing and time to IPO regressions; the results (available on request) are qualitatively similar to those reported in Table 3.

4. Conclusion

In this paper, we use U.S. county-level data to examine, for the first time, the influence of local banking market structure on IPOs. With a limited menu of financing options, small businesses contemplating the transition to a public domain must rely for growth on local banking institutions. Based on traditional market structure theory, we expect this transition to be characterized with substantially less friction when concentration induces banks to create cost savings for firms, as predicted by the information hypothesis, rather than when concentration induces banks to engage in a rent-extracting behaviour, as predicted by the market power hypothesis. We document fewer IPOs within concentrated markets and an interesting dichotomy: small issuers, which do not use VC, incur higher underpricing, but when the available banks are small, and therefore more organizationally fit to operationalize soft information, listing comes faster and at a lower cost. The former finding offers new empirical grounding to the market power hypothesis. The latter finding provides measurable evidence on the salience of soft information among less hierarchical organizations.

Author statement

Antonios Kallias: Conceptualization; Methodology; Formal analysis; Resources; Writing - Review & Editing; Visualization; Supervision; Project administration

Konstantinos Kallias: Conceptualization; Methodology; Formal analysis; Resources; Writing - Original Draft; Visualization; Supervision; Project administration

Guancheng Lu: Conceptualization; Methodology; Formal analysis; Resources

Song Zhang: Conceptualization; Methodology; Formal analysis; Resources; Writing - Review & Editing; Visualization; Supervision; Project administration

Declarations of Competing Interest

None.

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Appendix A

Sample selection by IPO offer price			
Panel A: IPO offer price > $5			
Total U.S. IPOs during 1998-2017 (excl. limited partnerships, reverse LBOs, spinoffs, closed-end funds)			3982
	Less: Financial firms (SIC codes 6000-6999)	(757)	3225
	Less: IPOs with offer price < $5	(392)	2833
	Less: IPOs with missing observations in CRSP related to underpricing	(488)	2345
	Less: IPOs with missing data for sales, underwriter, primary shares offered, VC	(565)	1780
Total small IPOs	Less: Issuers with more than 500 employees or with missing employee data in COMPUSTAT	(862)	918

(*continued on next page*)

(*continued*)

Sample selection by IPO offer price			
Small IPOs with VC			578
SNVCs			340
Panel B: IPO offer price < $5			
Total IPOs with offer price < $5			392
	Less: IPOs with missing observations in CRSP related to underpricing	(85)	307
	Less: IPOs with missing data for sales, underwriter, primary shares offered, VC	(173)	134
Total small IPOs	Less: Issuers with more than 500 employees or with missing employee data in COMPUSTAT	(87)	47
Small IPOs with VC			4
SNVCs			43

Appendix B

To illustrate the use of our unique *adjusted HHI*, let us consider two counties: county P and county Q. County P is filled with two banks, a large federal bank L (county share 0.02%; market share 99%) and a small local bank M (county share 100%; market share 1%). County Q also has two banks, the same large federal bank L (county share 0.02%; market share 1%) and a small local bank N (county share 100%; market share 99%). Note that because M and N operate entirely within their respective counties, they both have a county share of 100%. The following table calculates the *adjusted HHI* in each county:

Moreover, let us frame our *adjusted HHI* in relation to four distinct market types. These are schematically shown in Figure A1 and described further in Table A2.

By construction, our *adjusted HHI* is higher for markets of small (local) banks while lower for markets of large (federal) banks. The maximum value of the *adjusted HHI* is 1, which suggests that there is only one bank in the county and the bank operates within the county exclusively (a monopolistic local banking market). On the other hand, large (federal) banks conduct business nationwide. Given that there are more than 3,000 counties, this results in a minuscule share in each individual county. Hence, our *adjusted HHI* is an effective way of capturing whether a bank is a small local bank or not, which enables the distinction of market type as follows: *adjusted HHI* for type A market (**higher** market share * **higher** county share) > *adjusted HHI* for type B market (**higher** market share * **lower** county share) or type D market (**lower** market share * **higher** county share) or a hybrid market> *adjusted HHI* for type C market (**lower** market share * **lower** county share).

Thus, we can effectively distinguish between county P, a type B banking market, and county Q, a type A market; this distinction is impossible to make using either the traditional HHI or its interaction with bank size.

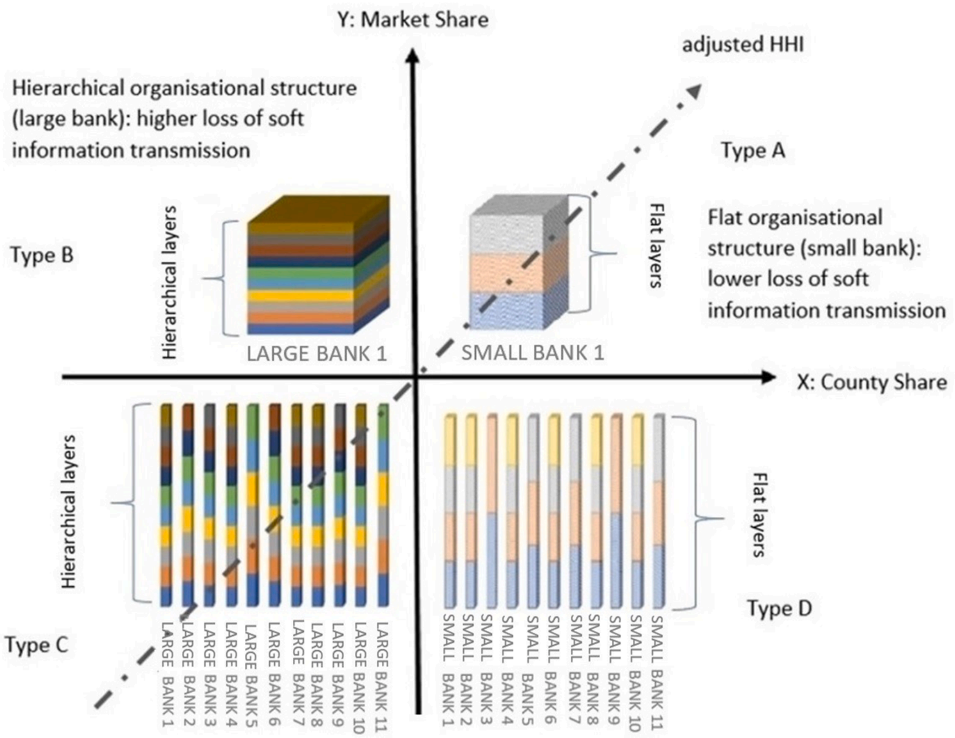

Fig. B1. Loss in soft information transmission across banks' organizational layers by banking market typeTable B1: The accuracy advantage of adjusted HHI: a 2-county illustration.

Table B1
The accuracy advantage of adjusted HHI: a 2-county illustration.

	Traditional HHI	An interaction term of county share (measure of bank sizes) and HHI $\sum_i [CS_{i,c} \times HHI_c]$,	Our unique adjusted HHI $\sum_i [CS_{i,c} \times MS_{i,c}]^2$
County P	0.9802 =99%^2+1%^2	0.9804 =0.02%*0.9802+100%*0.9802	0.0102 =(0.02%*99%)^2+(100%*1%)^2
County Q	0.9802 =1%^2+99%^2	0.9804 =0.02%*0.9802+100%*0.9802	0.9900 =(0.02%*1%)^2+(100%*99%)^2

Table B2
Banking market characteristics.

Types of market	Characteristics
Type A market (Quadrant I)	A concentrated banking market with predominantly small bank(s): an extreme case is that a small (local) bank dominates 100% of the county market while having no operations in other counties. Owing to a flatter organizational structure, there is a higher efficiency in soft information transmission and smaller information loss.
Type B market (Quadrant II)	A concentrated banking market with predominantly large bank(s): an extreme case is that a federal bank dominates 100% of the county market. Due to a hierarchical organizational structure, there is a greater loss of soft information.
Type C market (Quadrant III)	A competitive banking market with predominantly large banks.
Type D market (Quadrant IV)	A competitive banking market with predominantly small banks.

References

Bartlett III, R.P., Rose, P., Solomon, S.D., 2017. The small IPO and the investing preferences of mutual funds. J. Corporate Finance 47, 151–173.

Barry, C.B., Muscarella, C.J., Peavy Iii, J.W., Vetsuypens, M.R., 1990. The role of venture capital in the creation of public companies: evidence from the going-public process. J. Financ. Econ. 27 (2), 447–471.

Berger, A.N., Miller, N.H., Petersen, M.A., Rajan, R.G., Stein, J.C., 2005. Does function follow organizational form? Evidence from the lending practices of large and small banks. J. Financ. Econ. 76 (2), 237–269.

Berger, A.N., Rosen, R.J., Udell, G.F., 2007. Does market size structure affect competition? The case of small business lending. J. Banking Finance 31 (1), 11–33.

Berger, A.N., Udell, G.F., 2002. Small business credit availability and relationship lending: the importance of bank organisational structure. Econ. J. 112 (477), F32–F53.

Bradley, D.J., Cooney Jr., J.W., Dolvin, S.D., Jordan, B.D., 2006. Penny Stock IPOs. Financ. Manag. 35 (1), 5–29.

Corbae, D., D'Erasmo, P., 2020. Rising bank concentration. J. Econ. Dyn. Control, 103877.

Gompers, P.A., 1996. Grandstanding in the venture capital industry. J. Financ. Econ. 42 (1), 133–156.

Lerner, J., 1994. The syndication of venture capital investments. Financ. Manag. 23 (3), 16–27.

Liberti, J.M., Petersen, M.A., 2019. Information: hard and soft. Rev. Corporate Finance Stud. 8 (1), 1–41.

Loughran, T., Ritter, J., 2004. Why has IPO underpricing changed over time? Financial Manag. 33 (3), 5–37.

Megginson, W.L., Weiss, K.A., 1991. Venture capitalist certification in initial public offerings. J. Finance 46 (3), 879–903.

Nielsson, U., Wójcik, D., 2016. Proximity and IPO underpricing. J. Corporate Finance 38, 92–105.

Petersen, M.A., Rajan, R.G., 1995. The effect of credit market competition on lending relationships. Q. J. Econ. 110 (2), 407–443.

Ryan, R.M., O'Toole, C.M., McCann, F., 2014. Does bank market power affect SME financing constraints? J. Banking Finance 49, 495–505.

Schenone, C., 2004. The effect of banking relationships on the firm's IPO underpricing. J. Finance 59 (6), 2903–2958.