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## How do financial contracts evolve for new ventures?

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## ABSTRACT

While previous research has characterized the key features of contracts between entrepreneurs and venture capitalists, little is known about the contracts' evolution over time and across funding rounds. We overcome significant data challenges to compile a novel panel dataset of U.S. early-stage ventures that includes the main financial and control rights offered to investors at each (equity) funding round. We find that there is a 'default contract' with a distinct combination of rights that the majority of companies gravitate to. This default contract is typically implemented in the initial Series A funding round and rarely deviated from in later rounds. Whenever deviations do occur, terms are usually revised in favour of investors, and not entrepreneurs. Due to this stickiness of the default contract, for successful startups we argue that post-money valuations in later rounds can be a reasonable proxy for the economic value of the firm.

## 1. Introduction

Financing of entrepreneurial ventures raises many challenges. Investors have to evaluate, monitor and align incentives with entrepreneurs, and yet, despite these efforts, a significant proportion of new ventures (or 'startups') fail. One important feature of such venture capital (VC) is that capital is invested over multiple funding rounds. This 'staged financing' has many features of investing in options: an investor commits a limited amount of capital, which enables her to learn more about the potential of the venture and the entrepreneurs, and then decide whether to take up the option of investing further sums at subsequent funding rounds.

In every funding round, the new venture that raises capital will issue a new class of security (the 'series'), and rights given to investors of this new security are negotiated between the company and the investors. These rights are initially summarized in term sheets and are subsequently captured in the terms of legal contracts such as certificates of incorporation ('Chs'). In this paper, we use the terms 'rights' and 'contract terms' interchangeably to describe a new venture's cash flow rights and control rights given up to investors in exchange for capital.

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Except in some pre-seed rounds or late rounds where debt may be issued, the majority of funding rounds of new ventures issue equity to raise capital. New ventures typically issue two kinds of equity securities: common stock<sup>1</sup> and preferred stock.<sup>2</sup> Broadly speaking, common stock is normally held by founders and employees, and preferred stock is sold to investors to raise capital.<sup>3</sup> Common stock has the residual claim on the company's assets but little downside protection, while preferred stock has some preferential claim on the assets of the company in liquidation as well as a claim to residual assets if it is convertible. Therefore, preferred stock, with its additional protections, should have a higher value than common stock (Gornall and Strebulaev, 2020b).

While existing studies (Aghion and Bolton, 1992; Kaplan and Strömberg, 2003) have provided valuable theoretic insights and empirical evidence on the financial contracts adopted in VC deals, less is known about how these contracts evolve over their successive funding rounds. One reason for this lack of prior research is that data on contract terms is usually collected from VCs, who are unlikely to participate in every funding round of a company.<sup>4</sup> In their seminal paper on VC contracts, Kaplan and Strömberg (2003) obtain a sample of contracts directly from VCs, who release the details of the funding rounds in which they participate. They analyse 213 VC investments in 119 early-stage business by 14 VC firms. Most of these funding rounds were completed before the dot-com bubble burst in 2000. More recent research, such as (Bengtsson and Bernhardt, 2014) and (Bengtsson and Sensoy, 2015), focus on collecting terms negotiated in deals in which the VCs in their samples are involved.

Unlike the existing literature, we collect information on rights granted by the same new venture to investors across all share series issued across successive funding rounds over the venture's full life cycle. We therefore build a dataset that records the complete history of rights given to investors across all funding rounds in a given new venture. We extract the rights' information from new ventures' CoIs, which is the most reliable and detailed source of data. The original CoI of a U.S. registered company is filed when it is founded, and an amended CoI needs to be filed each time a new class of stock is issued.<sup>5</sup> As long as a class of stock remains outstanding, each subsequent amended CoI will document the terms applying to this class of stock for the period from the filing date of this amended CoI until the filing of a subsequent CoI. By reading all the CoIs filed by a given new venture, we can document the dynamics of how contractual terms evolve over funding rounds. Rights analyzed in this paper include both control rights, such as votes per share, and the key cash flow rights, such as dividends or liquidation preferences.

This new, extensive deal-level dataset of contract terms allows us to study several less explored but important questions: first, is there a standard set of contract terms that most new ventures adopt in each funding round? Second, how do rights offered to investors change over the course of multiple funding rounds during which new ventures raise additional capital and potentially bring in new investors? Third, how frequently do terms of existing share series get revised as new share series are issued? And finally, do the latest investors always get the most preferential terms?

To cover the full spectrum of the contractual evolution, we introduce a three-dimensional taxonomy that relates terms agreed at different stages of the dynamic contracting process to each other. As shown in Fig. 1, the system tracks the contractual evolution over the diagonal, the vertical, and the horizontal dimensions. The diagonal analysis compares the original share rights given to investors of each funding round at the time when such a share is issued. The vertical dimension analyses if and how the rights of existing series of stock are changed upon the introduction of a new share series. The horizontal analysis compares the rights of all existing share series at a given point in time.

Our main results are as follows. First, a default contract exists, which over half of new ventures in our sample adopt for their first funding round. This number is especially striking as there is very little overlap of investors across deals; the default contract is therefore not the result of the same limited number of investors repeatedly requesting identical rights across investments. Focusing on eight distinct key contractual terms, we find that the default contract is convertible preferred stock, with a 1× liquidation preference, one vote per share, and broad-based weighted anti-dilution protection. The default contract does not include participating preference, contractual dividends, redemption rights (at the investor's request), or IPO ratchets. For those companies that deviate from this default contract, the vast majority adopt more investor-friendly terms, most commonly in the form of liquidation preferences in excess of 1× and redemption rights. Only 5% of initial funding rounds have terms that are less investor-friendly. The contractual term that disappears most commonly in such cases is anti-dilution protection.

<sup>1</sup> In some cases, multiple classes of common stock are issued. These 'newly issued' types of common stock differ from the initial class of common stock in control rights, and preferred stock can normally not be converted into it. These different types of common stock are required to be converted into the normal, i.e. initial, common stock either at exit or at some point before the exit, as stipulated in the CoI. For our purposes, we only consider the terms offered to the initial class of common stock issued at the founding of the company, which preferred stock is convertible into.

<sup>2</sup> There are three different types of preferred stock: (1) pure preferred stock - the type of preferred stock that has senior cash flow rights over common stock but is given worse terms in other rights; for example, a junior preferred stock may have no voting rights or cannot convert into common stock; (2) convertible preferred stock - the type of preferred stock that, apart from enjoying senior cash flow rights over common stock (for instance, a liquidation preference), also has the same, if not better, terms in other rights; (3) participating convertible preferred stock - the type of convertible preferred stock that receives a liquidation preference and a pro-rata share of any remaining value. Collectively, we refer to them as 'preferred stock' in this paper. The overwhelming majority of preferred stock are of type (2).

<sup>3</sup> This classification is not absolute, as outside investors sometimes also hold common stock.

<sup>4</sup> In this paper, we consider a 'funding round' to be a round of funding where one and only one new equity security is issued. Sometimes the funding may be raised over a period of time (series B-1 followed by series B-2), but we treat these as a single round if they share a common security (e.g. Series B preferred).

<sup>5</sup> For simplicity, we will use the term 'CoI' to refer to both the initial document and the amended filings.

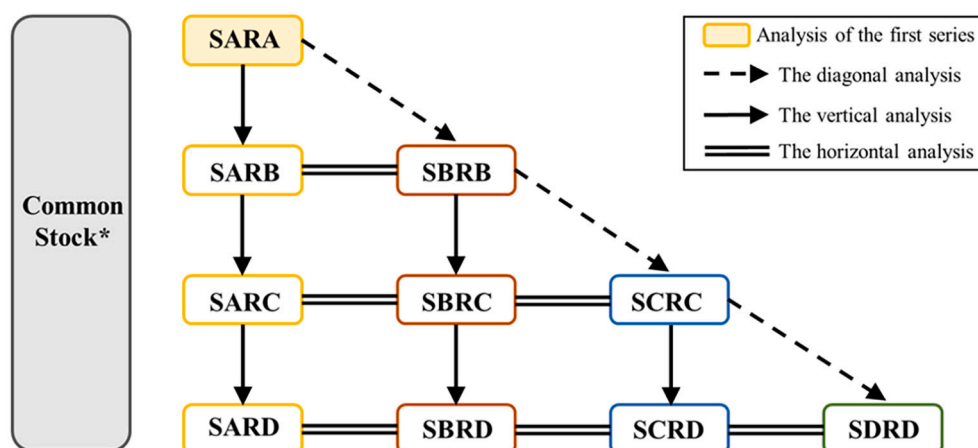


Fig. 1. Three-dimensional analytical framework.

The figure shows the three dimensions we analyse the evolution of contractual share rights in. We differentiate between share classes ('Series' or 'S') and the funding rounds ('Rounds' or 'R') these shares are issued in, i.e.  $S_jR_i$  where  $i, j = A, B, C, \text{ or } D$  stand for contractual share rights granted to series  $i$  at round  $j$ . We start our analysis from the first funding round, i.e., 'SARA' (Series A at Round A), to determine the characteristics of the initial contract given to investors in the first funding round. We then track how contracts evolve in the three directions: (1) diagonal, as indicated by the dashed arrow, to compare the contractual rights given to each new series issued at each new funding round; (2) vertical, as shown by the solid-line arrow, to determine whether (and, if so, how) contractual rights of each series are revised upon the closing of subsequent funding rounds and the corresponding issue of new shares; and (3) horizontal, as specified by the double line, to determine whether the contract of the latest series is the most senior, meaning the most investor friendly, among all outstanding (preferred) share classes. A contract is the most investor friendly among all the outstanding contracts if at least one of its rights is the most senior compared to all the other outstanding contracts, and none of its rights are junior to the other outstanding contracts.

\* Some companies issue more than one class of common stock. We refer to all common share classes collectively as 'common stock'.

Our second main result is that there is a strong tendency to carry existing rights forward, i.e. to give a new funding round the same rights as the preceding round. Whenever rights offered to new shares do change, they are more likely to become more investor-friendly. However, we also detect a mean reversion process, in which the contract given to a new series tends to reverse. Contracts with more senior (i.e. more investor-friendly) rights as compared to its predecessor round are frequently followed by more junior (i.e. less investor-friendly) rights in their successor rounds. In spite of these patterns, the default contract remains the most popular option irrespective of the funding round. Across rounds, less than half of companies adopt more investor-friendly contracts – in earlier rounds less than 40% –, and only around 5% choose less investor-friendly contracts.

As our third main result, we find that rights attached to existing shares get revised in less than 50% of the cases when a new series is issued, a result that is true irrespective of the funding round. When revisions happen, earlier series do not always get worse terms, and in some cases the terms become more senior. We also find that it is rare for some terms to be revised in a more investor-friendly (i.e. senior) way while others are revised in a less investor-friendly (i.e. junior) way within the same contract. This indicates that revisions of rights are typically positively correlated, a result consistent with the findings of Kaplan and Strömberg (2001). Nevertheless, in spite of the fact that the majority of contracts across our sample have the default rights, and in spite of the stickiness of such rights and the reversion process we see, there is also a tendency of contracts as a whole to become more senior in later funding rounds.

Finally, our results show that the latest share series issued in each round is the most investor-friendly compared to all other outstanding preferred share series in only about one third of cases. If latest series are more senior, it is typically in liquidation and anti-dilution protection rights. This is consistent with Gompers et al. (2020a) who show that these are the rights investors typically care about most. Meanwhile, dividends, redemption rights, participation rights and IPO ratchets are rare.

However, liquidation and anti-dilution protections are downside protections for investors, which are of most value in early stages when risks are high. In successful ventures investors give up these rights by converting their preferred shares into common stock in order to fully benefit from the upside. From this dynamic perspective, for very successful ventures the economic value derived from late funding rounds may be very close to their headline post-money valuation, even though such valuations tend to apply the price of the latest round to all previous rounds and the common stock.

The remainder of the paper proceeds as follows. In the next section we explain our data and sample construction in detail. In section 3, we describe the key contractual terms examined in this paper and check whether default contracts exist. In section 4 we analyse how the financial terms evolve over funding rounds. Section 5 concludes.

## 2. Data

We build a novel dataset of contractual rights embedded in all classes of common and preferred shares issued by U.S. VC-backed new ventures between 2001 and 2022, covering the full time period from the first equity financing until exit, or the end of our data

collection period in September 2021, whichever is earlier.<sup>6</sup> The rights are manually extracted from the companies' CoIs. This offers two major advantages. First, CoIs are publicly-available documents that contain the allocation of the most important control and cash flow rights between common and preferred shareholders. These documents therefore offer detailed insight into the contractual arrangements between founders and investors. Second, updated and amended CoIs need to be filed whenever there are changes in a company's capitalization or ownership, which allows the tracking of changes in contractual terms over time and across funding rounds.

It should be noted that CoIs do not contain every single contractual arrangement between a company and its investors. Some terms and conditions, most notably so-called drag- and tag-along rights, or rights pertaining to one specific investor, are only mentioned in term sheets or share sale agreements. However, these documents are not publicly-available and so we cannot include them in our analysis. To guarantee the accuracy of our data, we restrict our analysis to the eight most important control and cash flow rights that are explicitly mentioned in every CoI. These are: (1) contractual dividend rights; (2) the payout order upon liquidation; (3) the liquidation multiplier; (4) the liquidation participation; (5) the number of votes per share; (6) redemption rights; (7) anti-dilution protections; and (8) IPO ratchets. We discuss these rights in more detail in part 2.2.

Until recently, gathering information from CoIs was extremely challenging, involving the manual copying of documents held in different government agencies across various U.S. states. However, this data has recently become much more accessible via data providers such as Lagniappe Labs, who have at least one scanned CoI for around 6900 companies. For the purposes of our study, we make use of Lagniappe Labs' scanned CoI copies.

To extract the rights from CoIs, we read and manually codify all descriptive information needed for the purposes of our analyses for each of the eight rights from the CoIs. By doing so, we avoid potentially high error rates resulting from automated extraction processes, such as text parsing or machine learning-based methodologies. We also choose not to use the encoded contract terms from commercial databases, particularly because these encoded terms normally only show the rights applying to the latest series in a funding round, and because the accuracy of the encoded terms is difficult to verify.<sup>7</sup> We focus on a randomly-selected sample of 1080 CoIs filed by 300 U.S. VC-backed companies covering 1010 full funding rounds (1239 including sub-rounds) launched between 2001 and 2022. Our sampling process, including all applied filters, is described in Part 2.3.

### 2.1. The original and amended certificates of incorporation

The original CoI is filed upon the formation of a company and records three categories of information: (1) the company's legal name and its registered office; (2) the number of shares of each class of stock the company is authorized to issue; and (3) financing terms applying to all of the classes of stock that the company has issued or is entitled to issue. When such information changes, a company is legally required to file an updated CoI (referred to as a restated or amended CoI) with the authorities in the state where the company is registered.<sup>8</sup>

It is important to note that both original and amended CoIs contain a comprehensive list of share rights of all share classes issued by a given company which are outstanding at the time of the CoI filing date. For example, if a company issues Series C stock and publishes the corresponding amended CoI, this Series C CoI will also list all share rights of the Series B and Series A investors, at that time. Collecting both the Series B and Series C CoIs therefore allows us to observe the original rights of each series (i.e., at the time they were issued), and to observe any changes to the original Series B rights upon the issuance of the Series C shares. By tracking the CoIs over funding rounds we can observe the changing pattern of terms applying to each series over time.

To facilitate our study of the dynamic changes of series' terms, we link each CoI to the corresponding funding round of the company. A CoI is deemed to be associated with a class of preferred stock (series) if (1) it is the first, ranked by the filing date, that describes the terms applying to the new series, and if (2) among all the securities that are mentioned in the CoI, this series is the one issued in the most recent round at the time when the CoI was filed.<sup>9</sup>

### 2.2. Data extracted from certificates of incorporation

We extract two kinds of information from each CoI: (1) the general description of all classes of stock, including the authorized

<sup>6</sup> Other data sets similar to ours are: Kaplan and Strömberg (2003) analyse self-disclosure contracts by 14 VCs, covering 213 investments in 119 early-stage business, mostly before the dot-com bubble burst in 2000. Ewens et al. (2019) analyse around 2000 U.S. headquartered private companies' first VC-backed involved funding rounds that occurred between 2002 and 2015, using encoded contract terms from VCExperts and Pitchbook. Bengtsson and Bernhardt (2014) cover investments made by 804 VCs in 2066 funding rounds of 1783 U.S. companies between 2005 and 2009. A similar data set is used by Bengtsson and Sensoy (2015), covering the investments of 1211 VCs in 1587 funding rounds of 1237 U.S. companies between 2004 and 2008. Bienz and Hirsch (2012) examine contracts of 464 German venture capital investments in 290 companies between 1990 and 2004.

<sup>7</sup> The Appendix of this paper provides a summary overview table of certain database providers and the availability of encoded share rights in these databases.

<sup>8</sup> Before a U.S. private company is able to issue a certain number of shares of equity to raise capital, it must get approval from the Secretary of State or Department of State where it is registered. This approved number of equities is called 'authorized stock'. If a company needs to issue a new type of stock (that has not been authorized yet) or it wants to issue more shares of an 'authorized type of stock' than the 'authorized number of such stock', it needs to seek authorization by filing an amended CoI.

<sup>9</sup> For example, among all the CoIs of a given company, we look for the first (by filing date) to mention 'Series B'. If among all classes of preferred stock that are described in this CoI, Series B is issued in the latest round, then this CoI is considered to be associated with the Series B funding round.

number of shares of each class of stock the company issues, and the price per share; and (2) the share rights of each class of stock.<sup>10</sup> CoIs typically list six main categories of share rights: Dividends, liquidation rights, conversion rights, voting rights, redemption rights, and other protective provisions. We extract what we define as the key terms within each of these categories, based on the importance the terms have for the financial success of a shareholder's investment, and for the control the shareholders obtain over the company. Also, terms extracted should be quantifiable under reasonable assumptions.

Eight of such rights are chosen: (1) *contractual dividends* (abbreviated to CD), which define whether the payment of a dividend is contractually guaranteed, i.e. independent of claims of holders/directors or the performance of the investee company; (2) the *liquidation order* (LO), which defines the order in which investors get paid out of the proceeds in the case of liquidation; (3) the *liquidation multiplier* (LM), which is the promised payment amount in case of liquidation (which is normally defined to be any sale, reorganisation or restructuring that is not an IPO); (4) the *liquidation participation* (LP), defined as whether a class of stock can claim a pro rata share of the remaining assets after fully paying out the liquidation preference; (5) the *votes per share* (VT); (6) the *redemption rights* (RD), which define whether a class of stock is redeemable at the option of holders; (7) *anti-dilution protection* (ADP) rights, which are adjustments made to conversion ratios should there be a dilution event (a subsequent financing round that occurs at a lower price); and (8) *IPO ratchets* (IPO), which define minimum guaranteed/targeted IPO prices for a class of stock.

The collection process of these rights is done manually, by reading the CoIs line-by-line. While we perform this task ourselves, we have been guided by lawyers specializing in financial contracting and securities laws. This ensures that we capture all relevant details and understand the intricacies of the legal phrases used in the various sections of the CoIs. The often complicated wording and highly specialized terminology is also the reason why we deliberately avoid using text parsing software and/or language AIs, and instead opt for a manual approach.

### 2.3. Sample of companies

The original CoIs as filed by each company are archived by the state in which the company is registered. These filings are publicly available. However, obtaining copies of the submitted files from the state authorities is prohibitively expensive and complicated. Access fees are high, some states only provide physical copies which must be accessed in person or sent via postal mail (and are only mailed within the U.S.), and each of the 50 U.S. states has a different access procedure.<sup>11</sup> Instead of requesting copies of CoIs from each state, we therefore choose to obtain scanned CoI copies from the Genesis data base of Lagnippe Labs, a commercial data provider which archives share and share-related data of over 19,943 privately held U.S. companies (18,832 as of September 2019, the end of our data collection period).<sup>12</sup>

We apply four filters to obtain our sample. First, we identify all companies with at least one CoI available, reducing our sample to 6924 companies in the database. In a second step, we identify the number of equity funding rounds for each of these 6924 companies using Pitchbook and Crunchbase data. We then compare this number with the number of scanned CoI copies available in the database, and only choose those companies whose number of CoIs is equal to or greater than the number of their equity funding rounds. This restriction guarantees that we have a CoI for each funding round of a given company, which is a necessary condition for our analysis of the contractual rights evolution across funding rounds. 3110 companies are left after applying this second filter. In a third step, we exclude companies whose first equity funding round was launched prior to the year 2001, before the dot-com bubble burst. We also exclude companies whose first equity funding round was launched after 2018, as we are interested in the dynamics of contractual terms over multiple funding rounds and therefore need sufficient time for our in-sample companies to raise such rounds. 2995 companies are left after this third filter. In a fourth step, we create our final sample by randomly selecting companies from the 2995 sample, by assigning a random number to each company, ranking the companies according to these numbers in ascending order, and choosing the first 300 companies to create our sample. It is important to note that we impose no restrictions on companies' valuation, exit route, investment stage, industry or size.

Fig. 2 shows in which year our sample companies issued their first equity round. With the exception of the 2001–2003 period, we detect a fairly even distribution of companies across time. Table 1 displays the summary statistics of our sample. Panel A shows the companies' status: 48 companies were acquired or went public in an IPO, 83 companies closed down, and 76 remain private as of the end of 2021. The average founding year is 2010. 53% of the companies are based in Silicon Valley, and the majority of companies are classified as being in the IT industry (69%). The companies have raised an average of four funding rounds. Panel B displays summary statistics on the funding rounds in our sample. These cover all Seed Rounds as well as Rounds A to H, and exclude all internal funding rounds and all subseries (such as A-1, A-2 etc.).

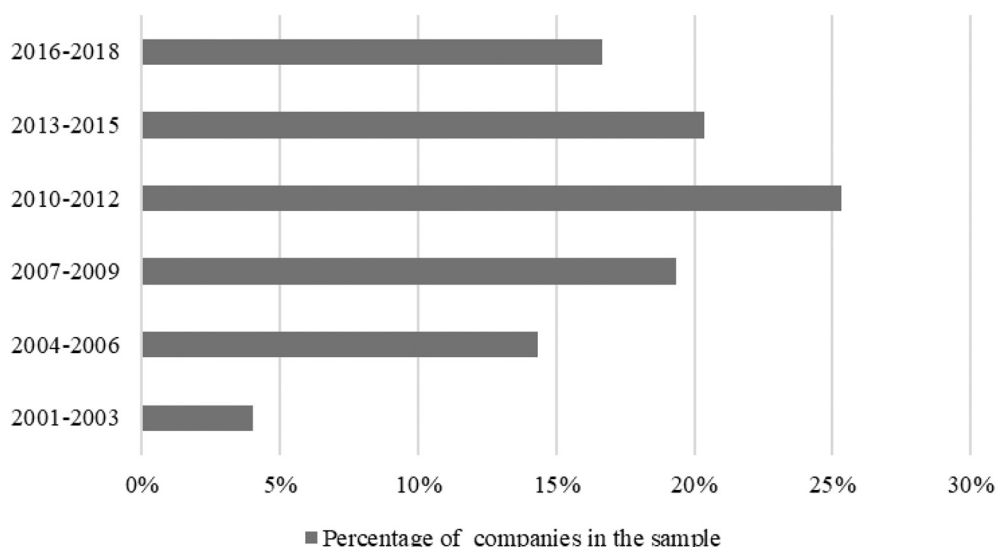
### 2.4. Potential data issues and solutions

We identify potential issues in our data collection process, each of which might bias our sample and/or cause erroneous data points. In the following, we explain how we address the issues in order to obtain an unbiased and correctly identified sample.

<sup>10</sup> A detailed explanation of what we extract from CoIs is provided in Online Appendix 1.

<sup>11</sup> For example, in Delaware, where most U.S. startups are registered, as of September 2019, a certified copy of a CoI costs \$50, plus \$2 per page (see <https://corp.delaware.gov/regguide/>).

<sup>12</sup> <https://lanyaplabs.com/>. Lagnippe Labs provides a variety of information on privately held U.S. companies with an emphasis on share-related data, such as filings (Form D's, Limited Offering Exemption Notices, CoIs), share valuation- and fundamental performance data, or capital raises.



**Fig. 2.** Distribution of Sample by Year of First Equity Issuance.

The figure shows the distribution of our sample companies by the year in which they first issued equity to outside investors. As our sample selection period is 2001 to 2018, the graph covers the whole observation period and thereby every company in our sample. For simplicity, we group the years into six buckets: 2001–2003, 2004–2006, 2007–2009, 2010–2012, 2013–2015 and 2016–2018.

**Table 1**

The Sample of Companies.

| Panel A. Company Characteristics                         |               |      |         |      |      |      |      |      |        |  |
|--|---------------|------|---------|------|------|------|------|------|--------|--|
|  | All Companies |      | Private |      | IPO  |      | M&A  |      | Closed |  |
| Number of Observations                                   | 300           |      | 76      |      | 48   |      | 93   |      | 83     |  |
| Average Year of Incorporation                            | 2010          |      | 2012    |      | 2010 |      | 2009 |      | 2008   |  |
| Average Launch Year of First Equity Round                | 2011          |      | 2013    |      | 2011 |      | 2010 |      | 2010   |  |
| Percent of Companies based in Silicon Valley Industries  | 53%           |      | 58%     |      | 48%  |      | 46%  |      | 59%    |  |
| Percentage of Companies in IT Industry                   | 69%           |      | 76%     |      | 42%  |      | 78%  |      | 66%    |  |
| Percentage of Companies in Biotech/Health Care Industry  | 18%           |      | 16%     |      | 31%  |      | 11%  |      | 19%    |  |
| Percentage of Companies in Other Industries              | 14%           |      | 8%      |      | 27%  |      | 11%  |      | 24%    |  |
| Total Funding Rounds by the End of 2021                  |               |      |         |      |      |      |      |      |        |  |
| Mean   | 4             |      | 4       |      | 6    |      | 4    |      | 3      |  |
| Median   | 4             |      | 4       |      | 6    |      | 3    |      | 3      |  |
| Panel B. Funding Round Characteristics                   |               |      |         |      |      |      |      |      |        |  |
| Funding Round  | Seed          | A    | B       | C    | D    | E    | F    | G    | H      |  |
| Number of Companies                                      | 73            | 286  | 223     | 171  | 120  | 66   | 37   | 19   | 9      |  |
| Number of Companies with CoI Available for the Round     | 57            | 254  | 199     | 152  | 96   | 56   | 35   | 18   | 9      |  |
| Percentage of Companies with CoI Available for the Round | 78%           | 89%  | 89%     | 89%  | 80%  | 85%  | 95%  | 95%  | 100%   |  |
| Company Age (in Years) when a Series is Issued           |               |      |         |      |      |      |      |      |        |  |
| Mean   | 1.11          | 1.52 | 2.96    | 4.39 | 5.78 | 7.20 | 8.30 | 8.58 | 10.29  |  |
| Median   | 0.68          | 1.07 | 2.46    | 3.94 | 5.32 | 7.05 | 8.06 | 8.92 | 10.63  |  |

The table reports summary statistics of our sample. In Panel A we report company-level characteristics of our sample, including numbers of observations, company age, locations, industries and the mean and median number of funding rounds. We report all numbers for the full number of companies in our sample ('All Companies'), as well as broken down by exit category. All non-exited deals are labelled 'private'. The mean and median number of funding rounds include all 'full' Series (A, B, C etc.), as well as the Seed Round and all sub-series (A-1, A-2 etc.). In Panel B we report funding round characteristics by the new series issued in each round. We show the number of sample companies per funding round, the number (and percentage) of the companies we obtain CoI information for, and the companies' age at the time of each funding round.

First, Lagniappe Labs does not always archive scanned copies of all series' CoIs. For some companies, we detect cases in which a CoI mentions an existing series, but the corresponding CoI is unavailable. As we are interested in the initial rights, and how these change over time (i.e. at the issuance of each subsequent share class), we only study the evolution of the rights of those series for which we have the initial CoI.

Second, we acknowledge a potential sampling issue. Lagniappe generally covers companies that are of interest to its clients. It is unclear if the clients use Lagniappe to seek information on any particular kind of company, or if their requests show, on average, no



specific patterns. The clients might have a tendency to favour information on well-known or successful companies as potential investment targets, instead of focusing on less successful or failing companies. As a result, our sample might be tilted towards more successful and high-profile companies. To balance this effect, we deliberately include companies in our sample which did not achieve a successful exit.

Third, we acknowledge that our data extraction process of the eight observed share rights does not cover every piece of information from the CoIs. For example, CoIs state that the liquidation amount for a series is typically ‘the sum of the applicable original issue price for such series of preferred stock plus declared but unpaid dividends on such share’. But since neither the data on the dividends’ declaration, nor their actual payments are available, we assume that all declared dividends have been paid.<sup>13</sup>

Also, it should be noted that we refrain from using company- and deal-level information recorded in commercial databases, such as Pitchbook and Crunchbase. We find that in these databases, the series issued in funding rounds might not necessarily match the information in legal filings. Also, commercial databases typically fail to capture the dynamic changes of contractual share rights over time, and instead only provide them at the time of the most recent funding round. We do, however, use Pitchbook to obtain comprehensive lists of investors across rounds.

A final potential concern could be the comparability of our sample, along with the underlying Genesis database, to other (commercial) databases covering similar data. The Appendix of this paper therefore provides a detailed comparison of our sample, and the Genesis database we take it from, to the two most popular and widely used commercial databases in Venture Capital- and start-up research, Pitchbook and Crunchbase. Besides a general overview of coverage, sample sizes, and startup (success) features, we also detail the availability and precision of contractual share rights in each of the databases.

### 3. The initial contract between entrepreneurs and investors

In this section, we discuss the rights granted to investors in the first formal funding round, i.e., the ‘Series A’.<sup>14</sup> A large body of literature on contracting dynamics shows that the initial contract between two parties can have a strong impact on all subsequent (re-) negotiations, and that contractual rights across funding rounds can be ‘sticky’ and strongly relate to each other (Roberts and Sufi, 2009; Garleanu and Zwiebel, 2009). The starting point for our contractual rights analysis is therefore the original Series A contract between investors and entrepreneurs.

We compare the contractual terms of the Series A funding round across the companies in our sample by studying the eight rights introduced above. We observe the value of each right across all Series A contracts and label the modal value of each right its ‘default’ value. As explained in detail in Online Appendix 1, we quantify the specific feature of each right to facilitate such study. For example, a liquidation multiplier is typically expressed as ‘x-times’ the initial acquisition price per share; we therefore record the actual multiplier as the value of the respective right. In our sample, the mode of this value is ‘1×’.

As shown in Fig. 3, startups offer very similar terms to investors in their Series A round. 99.2% of companies in our sample give investors a liquidation preference over common stock holders, while 73.6% do not include additional participation rights. We also find that the CD, RD, and IPO rights are not granted in the Series A, while, in contrast, LO, LM and ADP are typically offered and therefore part of the ‘default’ contract.

We further check how dispersed each right is regarding its default value. To do so, we build a variable named ‘Default Value Dispersion’  $D_{ij}^k$ .

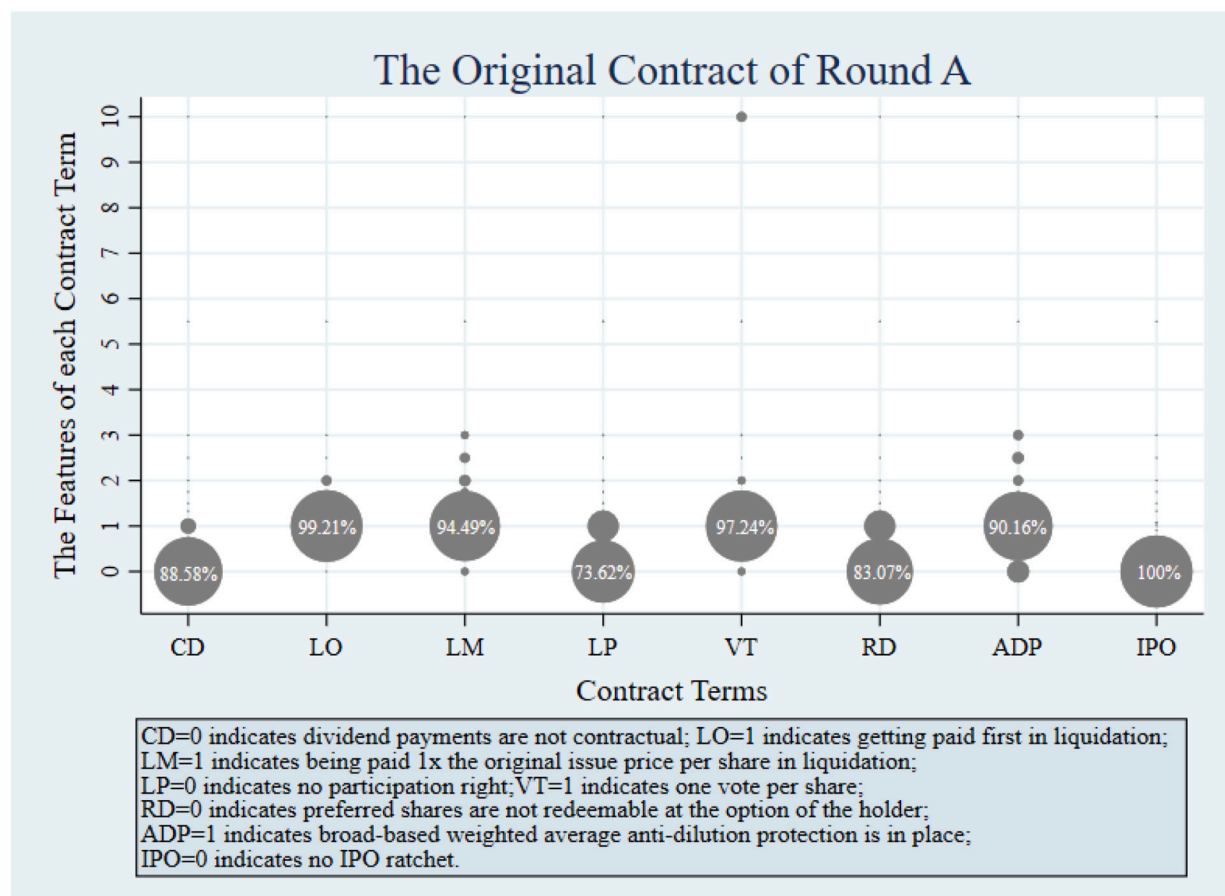
$$D_{ij}^k = \sqrt{\frac{(V_{ij}^k - F_{ij}^k)^2}{N_{ij}}}$$

where  $k$  = CD, LO, LM, LP, VT, RD, ADP, or IPO;  $i = 1, 2, \dots$  with  $N$  = series number;  $j (\geq i) = 1, 2, \dots$  with  $N$  = funding round number;  $V_{ij}^k$  is the value of right  $k$  of series  $i$  at funding round  $j$ ;  $F_{ij}^k$  is the default value right  $k$  of series  $i$  at funding round  $j$ ;  $N_{ij}$  is the number of observations of series  $i$  at funding round  $j$ .

Panel A of Table 2 shows the observed dispersion of each right. For some rights most observations are at the default level – but those that are not tend to deviate strongly. Votes per share (VT), for example: even though less than 3% of the observations deviate from the default value of one vote per share, it has a high dispersion of 0.805. This is due to extreme values we observe in some companies, such as ten votes per share (quantified as 10). In contrast, there are rights for which different contracts have different values, but the overall deviation is quite low. For example, in the case of CD, 11.4% of all observations deviate from the default value of ‘not paying contractual dividend’ but its dispersion is only 0.222. This suggests that while investors are more insistent on negotiating certain terms in their favour, they are more lenient in the negotiation of other terms. This conclusion is in line with Gompers et al. (2020a) who show that investors have stronger preferences over some rights than others.

<sup>13</sup> The Online Appendix gives a detailed list of all rights we do not include in our analysis (Online Appendix 3), and the corresponding assumptions we make pertaining to those rights included in our analyses (Online Appendix 4).

<sup>14</sup> Nearly 30% of companies in our sample issue Pre-Series A series such as Seed Rounds. However, we consider the contract agreed upon in Round A as the initial contract between entrepreneurs and investors. According to our discussions with VC practitioners, Pre-Seed and Seed contracts tend to differ from later rounds in which contractual terms (and valuations) are increasingly based on metrics and financial analysis. Instead, Pre-Seed and Seed round contracting tends to focus on validation through analysis of qualitative characteristics such as idea, team, and market. Therefore, we omit all Pre-Series A rounds from our analyses. In Online Appendix 5, we show the average features of the Seed round contracts in our sample.



**Fig. 3.** Share Right Features Granted in Series A Round ('Round A').

The figure shows the distribution of values for the eight contractual share rights we observe in our analyses, as adopted by companies in our sample in their Series A round. The terms are (1) contractual dividend ('CD'), (2) liquidation order ('LO'), (3) liquidation multiplier ('LM'), (4) liquidation participation ('LP'), (5) votes number per share ('VT'), (6) redemption right ('RD'), (7) anti-dilution protection ('ADP'), and (8) IPO ratchet ('IPO'). The x-axis displays the eight terms, the y-axis presents the features of each of the eight terms. The size of the grey circles displayed along vertical lines represents the proportion of companies that adopt a specific value of each right, so the percentage represented by circles along each vertical line sums up to 100%.

Apart from analyzing each term individually, we also examine whether companies tend to adopt a default contract across all eight rights. We define the default contract as the contract that adopts the default value for each of the eight rights. The combination of rights that make up the default contract is shown at the bottom of Table 2 Panel A. Default contracts have no contractual dividend (CD), meaning dividends – if, at all – are only paid out at the board's discretion. In liquidation, the default contract holders are paid out first (LO), at an amount that is equal to their initial investment (i.e. at the same share price they initially acquired the shares for; LM), but with no claim to any remaining assets (LP). They have one vote per share (VT). Shares are not redeemable at the option of the holder, meaning they cannot sell the shares back to the company at their discretion (RD). If new dilutive shares are issued, the default share series' conversion price must be adjusted downwards based on a broad-based weighted average basis (ADP). And finally, there are no IPO ratchets in default contracts (IPO); default contract owners therefore do not receive IPO price protection through the issuance of additional shares in case a minimum guaranteed IPO price is not reached.

Using the default contract as the benchmark, we then categorize contracts agreed upon in a funding round into three categories: (1) more investor-friendly contracts, (2) less investor-friendly contracts, and (3) mixed contracts. As a more investor-friendly contract, we identify all contracts with at least one right which is more investor-friendly than its default value, and no right which is less investor-friendly than the default value. Similarly, we call a contract less investor-friendly if the contract has at least one right which is less investor-friendly than the default value, and no right which is more investor friendly than the default value. Contracts where at least one right is less investor-friendly, and at least one other right is more investor friendly are labelled mixed contract. As shown in Panel B of Table 2, 54.3% of the 254 companies adopt the default contract. 37.4% offer more investor-friendly contracts and only 5.5% have less investor-friendly contracts. The mixed contract is used least, with an in-sample adoption rate of only 2.8%. These numbers suggest that Series A investors in new ventures rarely accept contractual terms and conditions which are disadvantageous when they could demand the more friendly default industry-standards terms.



**Table 2**  
Characteristics of Share Rights Granted in the Series A Round ('Round A').

| Panel A. Contractual Share Right Characteristics                |                             |                               |  |                                 |                    |                                     |                                 |                |     |
|---|-----------------------------|-------------------------------|--|---------------------------------|--------------------|-------------------------------------|---------------------------------|----------------|-----|
|   | CD                          | LO                            | LM   | LP                              | VT                 | RD                                  | ADP                             | IPO            |     |
| Number of Observations  | 254                         | 254                           | 254  | 254                             | 254                | 254                                 | 254                             | 254            |     |
| The 'Default' Value (Sample Mode)                               | 0                           | 1                             | 1  | 0                               | 1                  | 0                                   | 1                               | 0              |     |
| % Companies Adopting the 'Default' Value                        | 88.58%                      | 99.21%                        | 94.49%   | 73.62%                          | 97.24%             | 83.07%                              | 90.16%                          | 100%           |     |
| Dispersion from 'Default' Value                                 | 0.222                       | 0.089                         | 0.235  | 0.430                           | 0.805              | 0.401                               | 0.370                           | 0.000          |     |
| The Default Contract  | Dividend is not contractual | Get paid first in liquidation | Get paid the original issue price in liquidation | No claim on remaining assets    | One vote per share | Not redeemable at option of holders | Broad-based weighted protection | No IPO ratchet |     |
| Panel B. Contract Characteristics                               |                             |                               |  |                                 |                    |                                     |                                 |                |     |
|   |                             | Default Contract              |  | More Investor Friendly Contract |                    | Less Investor Friendly Contract     |                                 | Mixed Contract |     |
| No. Companies Adopting a Certain Type of Contract               |                             | 138                           |  | 95                              |                    | 14                                  |                                 | 7              |     |
| % Companies Adopting a Certain Type of Contract                 |                             | 54.33%                        |  | 37.40%                          |                    | 5.51%                               |                                 | 2.76%          |     |
| % Companies Raising Additional Funding Rounds                   |                             | 76.81%                        |  | 70.53%                          |                    | 71.43%                              |                                 | 85.71%         |     |
| Panel C. Percentage of Companies Deviating in Contractual Right |                             |                               |  |                                 |                    |                                     |                                 |                |     |
|   | No. Obs.                    | CD                            | LO   | LM                              | LP                 | VT                                  | RD                              | ADP            | IPO |
| More Investor Friendly Contract                                 | 95                          | 29.47%                        | .  | 14.29%                          | 65.26%             | 6.32%                               | 44.21%                          | 7.37%          | .   |
| Less Investor Friendly Contract                                 | 14                          | .                             | 7.14%  | .                               | .                  | .                                   | .                               | 92.86%         | .   |
| Mixed Contract  |                             |                               |  |                                 |                    |                                     |                                 |                |     |
| <i>Deviate to More Investor Friendly</i>                        | 7                           | 14.29%                        | .  | 14.29%                          | 71.43%             | .                                   | 14.29%                          | .              | .   |
| <i>Deviate to Less Investor Friendly</i>                        | 7                           | .                             | 14.29%   | 42.86%                          | .                  | 14.29%                              | .                               | 71.43%         | .   |

. Represents 0%.

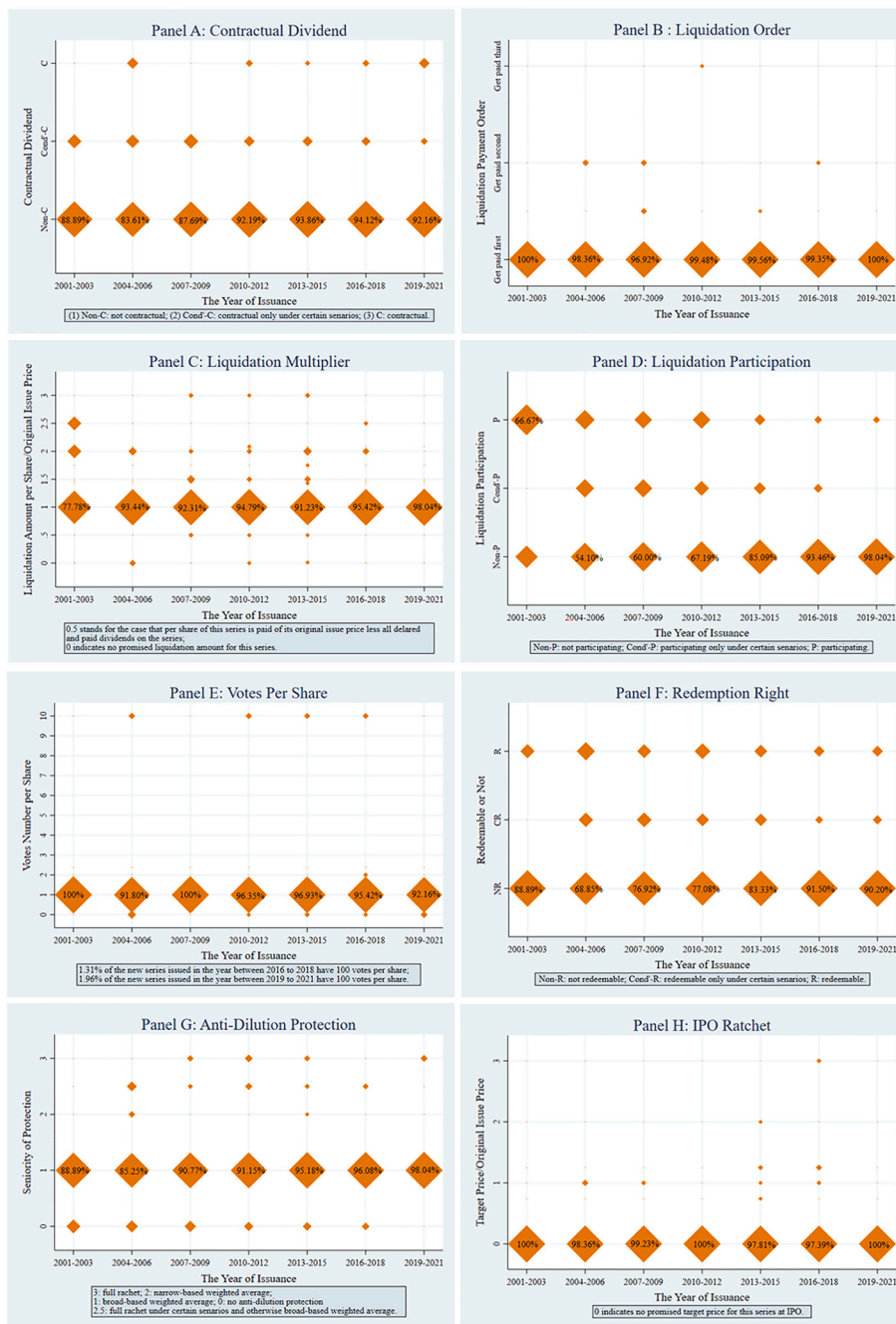
The table summarizes the features of each of our eight observed share rights, as defined above, granted in the Series A round. Panel A shows the value distribution of each right individually. We define contracts in which all eight share right values equal their respective individual default values (measured as the mode value across the sample of all first funding round contracts) as 'default contracts'. The row labelled 'the default contract' summarizes the features of the 'default contract'. Panel B presents the distribution of contracts among the four defined categories: 'default', 'more investor friendly', 'less investor friendly', and 'mixed'. A contract is categorized as 'more investor friendly' if, as compared to the default contract, at least one right is more investor friendly (to the holder) and no right is less investor friendly (to the holder). Similarly, the 'less investor friendly' contract is the contract which has, as compared to the default contract, at least one right which is less investor friendly (to the holder) and no right which is more investor friendly (to the holder). The mixed contract has at least one right which is more investor friendly (to the holder) and at least one right which is less investor friendly (to the holder), as compared to the default contract. For all non-default contracts, Panel C shows which individual rights deviate from their default values in how many instances.

In Panel C of [Table 2](#) we show in which of the eight observed rights the three types of non-default contracts deviate from their default values. Interestingly, we find that 65.3% and 44.2% of the more investor-friendly contracts offer liquidation participation and redemption rights, respectively. In contrast, the survey evidence from [Gompers et al. \(2020a\)](#) suggests that these two rights are of relatively little importance to VCs. They also find that voting rights and anti-dilution protection are relatively important to VCs. Nevertheless, only 6.3% of the contracts in our sample give more than one vote per share, while 7.4% offer better anti-dilution protection. A more striking finding is that all less investor-friendly contracts differ from the default contract in two rights only: liquidation order and anti-dilution protections. [Gompers et al. \(2020a\)](#) show that VCs are typically inflexible about having these rights. A lack of preference in liquidation order and/or anti-dilution protection may therefore be an indication that investors are not always successful in negotiating their first-best solution, even in very early-stage funding rounds.

We further examine whether the tendency to gravitate towards the default contract is because the companies in our sample receive investment from the same few investors. We do not find this to be the case. The Series A contracts in our sample receive investment from 1205 institutional investors, and 1028 out of these investors (85%) only invest in one company in our sample. The similarity in contractual terms is therefore not the result of a few investors negotiating their preferred deals with multiple different companies.

The existence of a default contract in the first funding round seems consistent with the industry practice that term sheets, which act as the basis of the final legal binding contract, are normally drafted by experienced lawyers who develop standard templates, and "only adjust a limited number of clauses to the specific conditions of each deal" according to [Da Rin and Hellmann \(2020\)](#). The practice of adopting a default contract is also consistent with the fact that these contracts are incomplete because of the difficulties to foresee what could happen in the future ([Hart, 1995](#)). Since the company's future success and therefore the profitability of the investment is hard to predict, especially for early-stage investments, choosing a conservative and balanced industry standard-solution for the Series A contract has become established practice.

In [Fig. 4](#), we show the development of the eight observed rights over time. Particularly, we show the percentages of all newly issued share series across all funding rounds that adapt a certain value of each right over time. We do so to spot potential trends in the VC



**Fig. 4.** Share Right Features over Time.

The figure shows the development of the eight contractual share rights observed in the analyses of the paper over time. The rights are: (1) contractual dividend (Panel A), (2) liquidation order (Panel B), (3) liquidation multiplier (Panel C), (4) liquidation participation (Panel D), (5) votes per share (Panel E), (6) redemption right (Panel F), (7) anti-dilution protection (Panel G), (8) IPO ratchet (Panel H). In each panel, the y-axis presents the features, or 'values', of each of the eight terms. We show the adoption of the rights over time, along the x-axis. The numbers, and the corresponding sizes of the orange rhombi, are the percentages of all newly issued share series across all funding rounds within each year bracket that adapted a certain value of each right. The percentage represented by the rhombi along each vertical line therefore sums up to 100%. To facilitate the interpretation of the numbers, consider the example of liquidation participation in Panel D. Between 2010 and 2012, 67% of all newly issued shares in funding rounds closed during that time period had no liquidation participation rights. Of all closed funding rounds between 2013 and 2015, 85% issued new shares with no liquidation participation – an 18 percentage point increase. The trend therefore suggests that participation rights became slightly more unpopular during this time period.

industry which would make certain rights more or less widely used over time, possibly across all deals and funding rounds. Besides being potentially interesting in their own right, such trends might bias the results of our rights' evolution analysis. However, as the graphs show, we detect no such trends. With the sole exception of liquidation participation rights, which see a stronger adoption in the beginning of our observation period than in more recent years, it appears as if all rights are adapted in a rather uniformly and standardized way over time.

#### 4. The evolution of contractual rights

Based on our findings regarding the original Series A contract, we now focus on the evolution of contractual rights across different funding rounds. The goal of this analysis is to provide insight into the contracting dynamics between investors in different funding rounds over time, and into the overall dynamics between entrepreneurs and all investors jointly. Specifically, we are interested in the distribution of rights among investors of different funding rounds, and in the changes to the rights of existing investors when a new funding round is negotiated. To do so, we make use of a three-dimensional analytical framework, as displayed in Fig. 1. It allows us to observe all changes in contractual rights over time and in relation to each other. In the *diagonal* analysis, we compare the original contractual rights given to each new funding round with the original rights of the preceding round. In the *vertical* analysis, we analyse whether the original rights given to each series are revised upon the issue of a subsequent funding round. And lastly, in the *horizontal* analysis, we compare which share series is the most (and least) senior at each given funding round over a company's lifecycle.

##### 4.1. The diagonal analysis: how do contracts of new series change over funding rounds?

In the diagonal analysis, we sequence all series issued by the same company by their issuing dates from earliest to latest and compare the original contract of a series - i.e., the contract terms given to a series when it is firstly issued - with the original contract of the series that had been issued immediately prior to it. We divide the results of the comparisons into four categories: (1) stay the same, (2) become senior, (3) become junior, and (4) mixed direction. In category (1), all rights remain unchanged. In category (2), at least one contractual right becomes more investor-friendly, and no term is less investor-friendly. In category (3), at least one contractual right becomes less investor-friendly, and no term is more investor-friendly. In category (4), at least one contractual right becomes senior and at least one contractual right becomes junior.

Table 3 presents the results. First, we observe a strong tendency to leave rights unchanged across funding rounds. In Panel A, we observe that the vast majority of default contracts are succeeded by a follow-up default contract (i.e., they stay the same), a result that holds irrespective of the funding rounds we observe. Panel B confirms this result for more investor-friendly contracts which also predominantly stay the same across rounds. Panel C shows a similar pattern for less investor friendly contracts. However, due to the small number of observations these results should be treated with more caution than those we observe in Panels A and B. Mixed contracts, as shown in Panel D, seem to have the strongest tendency to change; however, they, too, suffer from the same small number of observations we encounter in Panel C.

Second, Panels B and C suggest that certain contracts might have a tendency to reverse back to the default contract. In Panel B, we see a strong tendency for a more investor-friendly contract to be followed by a more junior contract. In Panel C, it is much more likely that the new series' contract will become more senior if the preceding contract is less investor-friendly. A potential explanation for this stickiness of contracts might be that a significant proportion of investors follow-on across funding rounds. Our data provides some support for this explanation: as shown in column '% New Investors in Round' of Table 3, while the majority of investors in each round are new, i.e. have not participated in prior funding rounds, a significant number (around 40% across all the funding rounds) of investors in a given round had participated in a previous round.

In Table 4, we explore the specific type of contract awarded in each series in more detail. We are particularly interested to see if any of our four observed contract types show adoption patterns across rounds, and to observe the frequency of change in our eight observed contract rights across rounds. Panel A of Table 4 shows that the default contract is the most popular option prior to the Series E round. Also, we see an increasing adoption rate of more investor-friendly contracts with each new round, especially towards later rounds: starting with Series E, the more investor-friendly contract becomes the most frequently adopted, even ahead of the default contract. In contrast, less investor-friendly and mixed contracts have a fairly low adoption rate of  $\leq 5\%$  throughout. The fact that only very few companies choose the mixed contract is consistent with Kaplan and Strömberg (2001) who show that cash flow and control rights are complements instead of substitutes.

Panels B to D of Table 4 show in which terms each category of non-default contracts deviate from the default. Panel B shows that in earlier rounds, most investor-friendly contracts are senior in cash flow rights such as the liquidation multiplier, liquidation participation, dividends and redemptions. In later rounds, the IPO ratchet becomes a popular add-on in more investor-friendly contracts. Panel C displays that less investor-friendly contracts are junior in comparison to the default contract in liquidation order and -multiple, votes per share and anti-dilution protection.

In Panel E of Table 4 we document the extent to which each contract deviates from the default contract via the dispersion metric we introduced in Part 3. The numbers suggest that, in comparison to the default contract, the extent to which more investor-friendly contracts are more senior is much higher than the extent to which less investor-friendly contracts are more junior, as signified by

**Table 3**

The 'Diagonal' Evolution of Share Rights.

| Panel A. Evolution of the Initial Contract if the Preceding Series Adopts the Default Contract                |                     |   |   |               |               |               |                 |
|---|---------------------|---|---|---------------|---------------|---------------|-----------------|
| Diagonal Evolution Direction  | Obs. <sup>(1)</sup> | % Companies w/out New Series (or no Data Available) | Conditional on Issuing a New Series and Data Availability |               |               |               |                 |
|   |                     |   | % New Investors in Round                                  | Stay the Same | Become Senior | Become Junior | Mixed Direction |
| A → B   | 138                 | 42.75%  | 59.01%  | 93.66%        | 5.07%         | 1.26%         | .               |
| B → C   | 118                 | 38.14%  | 58.45%  | 87.68%        | 10.96%        | 1.37%         | .               |
| C → D   | 86                  | 46.51%  | 57.71%  | 89.12%        | 8.69%         | .             | 2.17%           |
| D → E   | 52                  | 51.92%  | 58.21%  | 76.00%        | 24.00%        | .             | .               |
| E → F   | 25                  | 44.00%  | 60.64%  | 78.57%        | 14.29%        | 7.14%         | .               |
| Panel B. Evolution of the Initial Contract if the Preceding Series Adopts the More Investor Friendly Contract |                     |   |   |               |               |               |                 |
| Diagonal Evolution Direction  | Obs. <sup>(1)</sup> | % Companies w/out New Series (or no Data Available) | Conditional on Issuing a New Series and Data Availability |               |               |               |                 |
|   |                     |   | % New Investors in Round                                  | Stay the Same | Become Senior | Become Junior | Mixed Direction |
| A → B   | 95                  | 51.58%  | 61.24%  | 45.66%        | 4.36%         | 39.14%        | 10.86%          |
| B → C   | 71                  | 33.80%  | 47.57%  | 59.58%        | 8.50%         | 29.79%        | 2.13%           |
| C → D   | 59                  | 47.46%  | 55.46%  | 45.17%        | 29.03%        | 19.36%        | 6.45%           |
| D → E   | 40                  | 55.00%  | 53.21%  | 55.56%        | 11.11%        | 27.78%        | 5.56%           |
| E → F   | 27                  | 37.04%  | 44.93%  | 58.83%        | 17.65%        | 11.77%        | 11.77%          |
| Panel C. Evolution of the Initial Contract if the Preceding Series Adopts the Less Investor Friendly Contract |                     |   |   |               |               |               |                 |
| Diagonal Evolution Direction  | Obs. <sup>(1)</sup> | % Companies w/out New Series (or no Data Available) | Conditional on Issuing a New Series and Data Availability |               |               |               |                 |
|   |                     |   | % New Investors in Round                                  | Stay the Same | Become Senior | Become Junior | Mixed Direction |
| A → B   | 14                  | 35.71%  | 73.23%  | 44.44%        | 55.55%        | .             | .               |
| B → C   | 6                   | .   | 63.67%  | 66.67%        | 33.33%        | .             | .               |
| C → D   | 5                   | 20.00%  | 49.60%  | 75.00%        | 25.00%        | .             | .               |
| D → E   | 3                   | 66.67%  | 50.00%  | 100.00%       | .             | .             | .               |
| E → F   | 2                   | 100.00%   | .   | .             | .             | .             | .               |
| Panel D. Evolution of the Initial Contract if the Preceding Series Adopts the Mixed Contract                  |                     |   |   |               |               |               |                 |
| Diagonal Evolution Direction  | Obs. <sup>(1)</sup> | % Companies w/out New Series (or no Data Available) | Conditional on Issuing a New Series and Data Availability |               |               |               |                 |
|   |                     |   | % New Investors in Round                                  | Stay the Same | Become Senior | Become Junior | Mixed Direction |
| A → B   | 7                   | 28.57%  | 71.11%  | 20.01%        | 40.00%        | 20.01%        | 20.01%          |
| B → C   | 4                   | 25.00%  | 53.41%  | .             | 33.33%        | .             | 66.67%          |
| C → D   | 2                   | .   | 54.17%  | .             | 50.00%        | .             | 50.00%          |
| D → E   | 1                   | .   | 100.00%   | .             | .             | 100.00%       | .               |
| E → F   | 2                   | 50.00%  | 22.22%  | .             | .             | .             | 100.00%         |

. represents 0%.

<sup>(1)</sup> The number of companies in which the initial contract of the series issued in the preceding funding round is available

The table shows the evolution of contractual share rights between investors and companies across funding rounds. We compare rights given to the series (*S*) issued in a funding round (*R*) at the time of the closing of the funding round, i.e.,  $S_i R_i$  (the initial contract of series *i*, where *i* = B, C, etc.) with those given to the series issued in the previous funding round i.e.,  $S_{i-1} R_{i-1}$  (the initial contract of series *i-1*, where *i-1* = A, B, etc.). For every share right, we use the value displayed on  $S_i R_i$  minus that recorded on  $S_{i-1} R_{i-1}$  to determine whether and into which direction it changes. The changes of share rights in a new funding round in relation to those in the previous funding round must fall into one of the four categories (1) 'stay the same', meaning all share rights remain unchanged; (2) 'become senior', meaning at least one share right becomes more investor friendly to the series holder, and no share right is less investor friendly; (3) 'become junior', meaning at least one share right becomes less investor friendly to the series holder, and no share right is more investor friendly; (4) 'mixed direction', meaning at least one share right is more senior and at least one share right is junior. Panel A presents the distribution of companies in these four categories in each funding round. Panels B to D break down the initial contracts of preceding funding rounds by category and compare them to the initial contracts granted in the succeeding funding round(s). In addition to reporting the percent of companies falling into each respective category, we also report numbers of observations, and the percentage of companies that drop out of our sample for each evolution analysis, either due to lack of data or because they fail in raising a follow-up round. Finally, we report the percentage of new investors in each funding round, i.e. investors that have not participated in any of the prior funding rounds in each respective company.

the stark contrasts in the dispersion metric between the contract types.<sup>15</sup> Paired with the results of Panel A, this suggests that the more investor friendly contract is not only the more widely used contractual structure if companies and investors decide to deviate from default contracts, but it also awards more and stronger friendly rights to investors than the less investor friendly contract strips off the investors.

<sup>15</sup> Online Appendix 6 and 7 show the value distribution of each right specified in the original contract of each series.

**Table 4**  
The Original Contract of Each Series.

| Panel A. The Original Contract of Each Series: Default or Deviate?                   |         |                      |                                 |                                 |                                 |                                 |                |                |        |
|--|---------|----------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|----------------|----------------|--------|
| Categories of Contract   | Obs.    | The Default Contract |                                 | More Investor Friendly Contract |                                 | Less Investor Friendly Contract |                | Mixed Contract |        |
| Series A   | 254     | 54.33%               |                                 | 37.40%                          |                                 | 5.51%                           |                | 2.76%          |        |
| Series B   | 199     | 59.30%               |                                 | 35.68%                          |                                 | 3.02%                           |                | 2.01%          |        |
| Series C   | 152     | 56.58%               |                                 | 38.82%                          |                                 | 3.29%                           |                | 1.32%          |        |
| Series D   | 96      | 54.17%               |                                 | 41.67%                          |                                 | 3.13%                           |                | 1.04%          |        |
| Series E   | 56      | 44.64%               |                                 | 48.21%                          |                                 | 3.57%                           |                | 3.57%          |        |
| Series F   | 35      | 34.29%               |                                 | 54.29%                          |                                 | 5.71%                           |                | 5.71%          |        |
| Panel B. The More Investor Friendly Contract: Deviation in which Contractual Rights? |         |                      |                                 |                                 |                                 |                                 |                |                |        |
| Contractual Rights   | Obs.    | CD                   | LO                              | LM                              | LP                              | VT                              | RD             | ADP            | IPO    |
| Series A   | 95      | 29.47%               | .                               | 10.53%                          | 65.26%                          | 6.32%                           | 44.21%         | 7.37%          | .      |
| Series B   | 71      | 26.76%               | .                               | 9.86%                           | 61.97%                          | 2.82%                           | 39.44%         | 8.45%          | 1.41%  |
| Series C   | 59      | 13.56%               | .                               | 13.56%                          | 47.46%                          | 5.08%                           | 45.76%         | 10.17%         | 1.69%  |
| Series D   | 40      | 10.00%               | .                               | 27.50%                          | 52.50%                          | 10.00%                          | 40.00%         | 5.00%          | 10.00% |
| Series E   | 27      | 11.11%               | .                               | 14.81%                          | 37.04%                          | 3.70%                           | 44.44%         | 14.81%         | 7.41%  |
| Series F   | 19      | 5.26%                | .                               | 21.05%                          | 57.89%                          | 10.53%                          | 52.63%         | 5.26%          | 10.53% |
| Panel C. The Less Investor Friendly Contract: Deviation in which Contractual Rights? |         |                      |                                 |                                 |                                 |                                 |                |                |        |
| Contractual Rights   | Obs.    | CD                   | LO                              | LM                              | LP                              | VT                              | RD             | ADP            | IPO    |
| Series A   | 14      | .                    | 7.14%                           | .                               | .                               | .                               | .              | 92.86%         | .      |
| Series B   | 6       | .                    | .                               | .                               | .                               | 33.33%                          | .              | 66.67%         | .      |
| Series C   | 5       | .                    | .                               | .                               | .                               | 40.00%                          | .              | 80.00%         | .      |
| Series D   | 3       | .                    | .                               | .                               | .                               | .                               | .              | 100%           | .      |
| Series E   | 2       | .                    | 50.00%                          | .                               | .                               | .                               | .              | 50.00%         | .      |
| Series F   | 2       | .                    | .                               | 50.00%                          | .                               | 50.00%                          | .              | .              | .      |
| Panel D. The Mixed Contract: Deviation in which Contractual Rights?                  |         |                      |                                 |                                 |                                 |                                 |                |                |        |
| Contractual Rights   | Obs.    | CD                   | LO                              | LM                              | LP                              | VT                              | RD             | ADP            | IPO    |
| Series A   | 7       | 14.29%               | .                               | 14.29%                          | 71.43%                          | .                               | 14.29%         | .              | .      |
|  | 7       | .                    | [14.29%]                        | [42.86%]                        | .                               | [14.29%]                        | .              | [71.43%]       | .      |
| Series B   | 4       | 50.00%               | .                               | 25.00%                          | 50.00%                          | .                               | 50.00%         | .              | .      |
|  | 4       | .                    | [50.00%]                        | [25.00%]                        | .                               | [25.00%]                        | .              | [25.00%]       | .      |
| Series C   | 2       | 50.00%               | .                               | .                               | 100%                            | .                               | 50.00%         | .              | 50.00% |
|  | 2       | .                    | .                               | .                               | .                               | [50.00%]                        | .              | [50.00%]       | .      |
| Series D   | 1       | .                    | .                               | .                               | .                               | .                               | 100%           | .              | .      |
|  | 1       | .                    | [100%]                          | .                               | .                               | .                               | .              | .              | .      |
| Series E   | 2       | .                    | .                               | 50.00%                          | 50.00%                          | .                               | 100%           | .              | .      |
|  | 2       | .                    | [50.00%]                        | .                               | .                               | [50.00%]                        | .              | .              | .      |
| Series F   | 2       | 50.00%               | .                               | .                               | 50.00%                          | .                               | 50.00%         | .              | .      |
|  | 2       | .                    | [50.00%]                        | [50.00%]                        | .                               | [50.00%]                        | .              | [50.00%]       | .      |
| Panel E. Dispersion: Extent of Deviation from the Default                            |         |                      |                                 |                                 |                                 |                                 |                |                |        |
| Categories of Contract   | Overall |                      | More Investor Friendly Contract |                                 | Less Investor Friendly Contract |                                 | Mixed Contract |                |        |
| Series A   | 2.55    |                      | 3.74                            |                                 | 1.23                            |                                 | 3.80           |                |        |
| Series B   | 8.75    |                      | 14.36                           |                                 | 1.22                            |                                 | 3.94           |                |        |
| Series C   | 9.53    |                      | 15.11                           |                                 | 1.53                            |                                 | 3.27           |                |        |
| Series D   | 11.90   |                      | 18.24                           |                                 | 1.00                            |                                 | 1.50           |                |        |
| Series E   | 3.12    |                      | 4.14                            |                                 | 1.06                            |                                 | 2.91           |                |        |
| Series F   | 4.77    |                      | 5.64                            |                                 | 1.05                            |                                 | 5.66           |                |        |

Represents 0% or no data;

[] Represents the percentage of mixed contracts that deviate to less investor friendly.

The table reports the rights of the original contract in each series. We group contracts into four categories: (1) the 'default' contract is based on the mode value for each contractual term, as defined in Table 2; (2) the 'more investor-friendly' contract has at least one term which is more investor friendly to the series holder and no term which is less investor friendly, as compared to the default contract; (3) the 'less investor-friendly' contract has at least one term which is less investor friendly to the series holder and no term which is more investor friendly, as compared to the default contract; and (4) the 'mixed' contract has at least one term which is more investor friendly and at least one term which is less investor friendly, as compared to the default contract. Panel A shows the percentage of each type of contract per series. Panels B to D show which of the eight observed contractual rights change across rounds, broken down by the three non-default contract categories. The numbers indicate the percentage of contractual rights which deviate from their default values. Panel E reports how much the original contract of a series deviates from the default contract as well as the extent to which each type of contract deviates from the default contract, using the dispersion measure introduced in Table 2 and Part 3 of the paper.

The fact that more investor friendly contracts are more common than less investor friendly contracts, and the fact that there is a strong tendency to award strong investor friendly rights could perhaps be the result of bargaining powers between entrepreneur and investors. Either both parties agree on the default contract, or – if there is a deviation – the investors have the stronger bargaining power to steer the contract in their favour. The other way around, i.e. the entrepreneur having the upper hand in bargaining, rarely seems to be the case.

Furthermore, the addition of some investor friendly rights, particularly IPO ratchets, may be a way to obtain higher valuations, allowing the company to raise more money for the additional equity being sold and thereby benefiting both the investors and the company.

#### 4.2. The vertical analysis: how does the contract of a series change when a new series is issued?

In the vertical analysis of the contract evolution, we examine the revision of rights applying to existing series when new shares are issued. As well as shedding light on how often existing rights are changed by the contractual agreements of new funding rounds, we also classify whether they become more, or less, investor-friendly.

As with the diagonal analysis, we divide the direction of revisions into four categories: (1) stay the same, (2) become senior, (3) become junior, and (4) mixed direction. In category (1), the rights of an existing series remain unchanged upon launch of a new round. In category (2), at least one share right becomes more investor-friendly, and no share right is less investor-friendly. In category (3), at least one share right becomes less investor-friendly, and no share right is more investor-friendly. In category (4), at least one share right is more senior, and at least one share right is junior. Panel A of Table 5 shows the number of companies for which we have contractual data for the same share series in two consecutive rounds, i.e. the data that is necessary for us to perform the vertical evolution of rights.

The results are presented in Panels B to E of Table 5. Panel B suggests that existing rights rarely get revised when new series are issued, as the majority of the series' contractual rights stay the same across different rounds. With two minor exceptions (Series C and Series D at Round E, with <50%) this is true across all stages. Panels C and D show that even when revisions happen, old series do not always get 'cramped down' (i.e. become more junior), and in some cases, they get more senior terms as a result of the contract revision. Perhaps it is surprising how infrequently existing investors are cramped down upon the issuance of new share series. This finding could be a sign that contractual negotiations are not necessarily always designed at 'hurting' prior share series, and that there is not an industry-wide systematic pattern of 'more rounds = worse rights' for existing investors. Also, the fact that existing investors can sometimes benefit shows that, at least in some instances, they have some degree of bargaining power when it comes to the negotiation of new share series' rights.

Panel E shows that revisions to the cash flow and control rights given to VCs are positively correlated, which is consistent with the finding of (Kaplan and Strömberg, 2001): it rarely happens that some terms are revised up while others are revised down within the same contract.

#### 4.3. The horizontal analysis: does the latest series always obtain the most investor-friendly terms?

In the last step of the analysis of the contractual evolution we focus on the horizontal component, that is, how the rights of the latest funding round compare to rights given to all previous rounds. Particularly, we are interested in how the rights given to the latest series (of preferred shares) compare to those offered to common stock. This is crucial for assessing whether it is rational to use the per share price of the latest series to value the company, by implicitly applying the same price, negotiated at the latest round, to all rounds of investors' preferred shares and the common stock held by the entrepreneurs. To do so, we compare the rights applying to all outstanding series and the common stock (issued by the same company) at the same point of time.

As presented in Panel A of Table 6, we find that the latest series of each round is the most investor-friendly compared to all the other outstanding series in only up to 35% of all cases. As a matter of fact, we detect a somewhat fairly even distribution of seniority among the latest investors, particularly in later rounds: for example, it is almost as likely for Round E investors to be most senior (35%), as it is to be equal with others (30%) and/or to be mixed (28%). And prior to Round E, it is always more likely for rounds to be equal in seniority than it is to be more or less senior than others. These findings are less surprising in light of our previous results: default contracts are the most commonly used contractual structure, and revisions do not happen frequently. And when they do, they are not necessarily always aimed at making new investors more senior than existing investors. It is therefore perhaps unsurprising that we do not find the latest investors in each round to be the most senior in every instance. Jointly, these findings lend further support for our conjecture that a VC-industry wide pattern of 'more rounds = worse rights' for (early) investors is not apparent.

In Panel B, we break down the contracts into the eight observed separate rights of our analyses. As we would expect, being preferred shares, the latest series are more senior than common stock in their liquidation and anti-dilution protections. This is consistent with (Gompers et al., 2020a): investors care most about these rights, so it is perhaps unsurprising to see that they are a staple of most series. Meanwhile, dividends, redemption rights, participation rights and IPO ratchets are offered to investors in fewer cases. However, the latest series typically have no claim on the remaining assets in liquidation unless they convert into common stock or give up the promised liquidation amount.

The extra 'special right' most of the latest series have in relation to common stock is downside protection, which is of real value to investors if the company is in the early stages. Risks are high, the performance might be below expectations, and the probabilities of closing the venture down or facing a fire-sale are high. However, as the company matures it will raise additional funding rounds and thereby increase the probability of a successful exit. The value of the downside protection therefore becomes more and more limited, and the value premium of the latest series over common stock is low or non-existent.



**Table 5**  
The 'Vertical' Evolution of Share Rights.

| Panel A. Number of Observations  |          |          |          |          |          |
|--|----------|----------|----------|----------|----------|
|  | Series A | Series B | Series C | Series D | Series E |
| Round A  | 254      |          |          |          |          |
| Round B  | 139      | 199      |          |          |          |
| Round C  | 127      | 128      | 152      |          |          |
| Round D  | 81       | 82       | 83       | 96       |          |
| Round E  | 41       | 43       | 44       | 44       | 56       |
| Round F  | 29       | 30       | 31       | 32       | 32       |
| Panel B. Percentage of Companies that do not Revise Share Rights Given to a Series ('Stay the Same')                 |          |          |          |          |          |
|  | Series A | Series B | Series C | Series D | Series E |
| Round A  | .        |          |          |          |          |
| Round B  | 64.75%   | .        |          |          |          |
| Round C  | 62.20%   | 62.50%   | .        |          |          |
| Round D  | 50.62%   | 52.44%   | 53.01%   | .        |          |
| Round E  | 51.22%   | 53.49%   | 47.73%   | 47.73%   | .        |
| Round F  | 55.17%   | 60.00%   | 58.06%   | 53.13%   | 56.25%   |
| Panel C. Percentage of Companies that Revise Share Rights Given to a Series 'Up' ('Become Senior')                   |          |          |          |          |          |
|  | Series A | Series B | Series C | Series D | Series E |
| Round A  | .        |          |          |          |          |
| Round B  | 5.04%    | .        |          |          |          |
| Round C  | 6.30%    | 3.13%    | .        |          |          |
| Round D  | 7.41%    | 7.32%    | 7.23%    | .        |          |
| Round E  | 4.88%    | 4.65%    | 6.82%    | 6.82%    | .        |
| Round F  | 3.45%    | .        | 3.23%    | 6.25%    | 3.13%    |
| Panel D. Percentage of Companies that Revise Share Rights Given to a Series 'Down' ('Become Junior')                 |          |          |          |          |          |
|  | Series A | Series B | Series C | Series D | Series E |
| Round A  | .        |          |          |          |          |
| Round B  | 25.18%   | .        |          |          |          |
| Round C  | 28.35%   | 28.91%   | .        |          |          |
| Round D  | 39.51%   | 35.37%   | 37.35%   | .        |          |
| Round E  | 36.59%   | 34.88%   | 38.64%   | 36.36%   | .        |
| Round F  | 34.48%   | 30.00%   | 32.26%   | 34.38%   | 34.38%   |
| Panel E. Percentage of Companies that Revise Share Rights Given to a Series both 'Up' and 'Down' ('Mixed Direction') |          |          |          |          |          |
|  | Series A | Series B | Series C | Series D | Series E |
| Round A  | .        |          |          |          |          |
| Round B  | 5.04%    | .        |          |          |          |
| Round C  | 3.15%    | 5.47%    | .        |          |          |
| Round D  | 2.47%    | 4.88%    | 2.41%    | .        |          |
| Round E  | 7.32%    | 6.98%    | 6.82%    | 9.09%    | .        |
| Round F  | 6.90%    | 10.00%   | 6.45%    | 6.25%    | 6.25%    |

. Originally agreed upon terms when a series is issued for the first time. There is therefore, by definition, no 'revision', and the fields are left blank. The table shows the evolution of contractual rights of a certain series across rounds. We compare the eight observed contractual rights across two successive rounds to determine whether they become more investor friendly ('senior') or less investor friendly to the holder ('junior'). Contract revisions in a certain round therefore fall into one of four categories: (1) 'stay the same': all terms remain unchanged; (2) 'become senior': at least one term becomes more investor friendly to the series holder and no term is less investor friendly; (3) 'become junior': at least one term becomes less investor friendly to the series holder and no term is more investor friendly; (4) 'mixed direction': at least one term is more senior and at least one term is junior. Panel A shows for how many sample companies we have access to data of both the terms applying to a certain series and the terms offered to the same series in the preceding round. Each case in which we have data for the same right across two successive rounds is counted as one observation. Panels B to E show the percentage of companies in our sample that revise the contracts of the preceding series when a new funding round is issued, and the category into which the revision falls.

This raises some doubts about the conclusion of [Gornall and Strebulaev, 2020b](#) and [Gornall and Strebulaev, 2021](#) that the use of post-money valuations overstates the value of unicorns, since such companies are, by definition, successful by this stage. Preferred shareholders of these promising and successful companies will voluntarily convert their shares into common stock at exit. As a result, although it is possible that the values of young and poorly-performing companies are inflated by using the post-money valuations (since in the early years the protections afforded by preferred stock have considerable option value), the reported post-money valuation of mature and successful companies (e.g. unicorns) are less likely to be over-stated, at least not by the logic that the latest series is always more valuable than the common stock.

#### 4.4. Rights allocation strategy: how companies allocate rights among investors

In the horizontal analysis above, we show that companies do not always give their latest series the most senior rights over other outstanding series. This conclusion is obtained at the security level. In this section, we conduct a similar study on the company level. For each of the eight contractual rights studied in this paper we summarize what kind of allocation strategy new ventures adopt across their funding rounds to answer the question: How do they distribute rights among investors of different series at a certain funding round. We define four kinds of rights allocation strategies: (1) all series are given the same rights (equal rights) (2) later (issued) series obtain some senior rights while other rights stay equal (later series are senior); (3) later series obtain some junior rights while other rights stay equal (later series are junior); (4) any allocation strategies that do not fall into the previous three categories (mixed).

As shown in Panel A of [Table 7](#), the overwhelming majority of companies have a very strong tendency to allocate rights equally by giving all outstanding series the same rights. An exception to that are only liquidation order (LO) rights, for which 20% to 50% of companies give later series the seniority of getting paid ahead of earlier series.

## 5. Conclusion

In this paper, we study contracts between entrepreneurs and investors in new ventures (i.e. startups) and their evolution over multiple funding rounds. The starting point for our analysis is the initial Series A financing, for which we find surprisingly little

**Table 6**  
The 'Horizontal' Analysis of Share Rights.

| Panel A. How Investor-Friendly is the Latest Series Compared to Other Series?           |      |                            |        |                             |        |                          |        |        |       |
|---|------|----------------------------|--------|-----------------------------|--------|--------------------------|--------|--------|-------|
|   | Obs. | The Most Investor Friendly |        | The Least Investor Friendly |        | Same as all Other Series |        | Mixed  |       |
| Round A <sup>(1)</sup>  | 254  |                            |        |                             |        |                          |        |        |       |
| Round B   | 198  | 23.23%                     |        | 4.55%                       |        | 67.17%                   |        | 5.05%  |       |
| Round C   | 151  | 32.45%                     |        | 4.64%                       |        | 52.98%                   |        | 9.93%  |       |
| Round D   | 96   | 35.42%                     |        | 6.25%                       |        | 40.63%                   |        | 17.71% |       |
| Round E   | 54   | 35.19%                     |        | 7.41%                       |        | 29.63%                   |        | 27.78% |       |
| Round F   | 35   | 22.86%                     |        | 14.29%                      |        | 20.00%                   |        | 42.86% |       |
| Panel B. Compared to Common Stock, the Latest Series have Senior Rights in which Terms? |      |                            |        |                             |        |                          |        |        |       |
|   | Obs. | CD                         | LO     | LM                          | LP     | VT                       | RD     | AD     | IPO   |
| Round A   | 254  | 11.42%                     | 98.82% | 99.61%                      | 0.79%  | 2.36%                    | 16.93% | 92.91% | .     |
| Round B   | 199  | 10.55%                     | 99.50% | 100%                        | 0.50%  | 0.50%                    | 15.08% | 97.49% | 0.50% |
| Round C   | 152  | 5.92%                      | 100%   | 100%                        | .      | 1.32%                    | 18.42% | 96.71% | 1.32% |
| Round D   | 96   | 4.17%                      | 100%   | 100%                        | .      | 3.13%                    | 17.71% | 96.88% | 4.17% |
| Round E   | 56   | 5.36%                      | 100%   | 100%                        | .      | 1.79%                    | 25.00% | 98.21% | 3.57% |
| Round F   | 35   | 5.71%                      | 97.14% | 94.29%                      | .      | 5.71%                    | 31.43% | 97.14% | 5.71% |
| Panel C. Compared to Common Stock, the Latest Series have Junior Rights in which Terms? |      |                            |        |                             |        |                          |        |        |       |
|   | Obs. | CD                         | LO     | LM                          | LP     | VT                       | RD     | AD     | IPO   |
| Round A   | 254  | .                          | 0.39%  | .                           | 83.46% | 0.39%                    | .      | .      | .     |
| Round B   | 199  | .                          | 0.50%  | .                           | 87.94% | 1.51%                    | .      | .      | .     |
| Round C   | 152  | .                          | .      | .                           | 92.11% | 1.97%                    | .      | .      | .     |
| Round D   | 96   | .                          | .      | .                           | 89.58% | 2.08%                    | .      | .      | .     |
| Round E   | 56   | .                          | .      | .                           | 89.29% | 5.36%                    | .      | .      | .     |
| Round F   | 35   | .                          | .      | .                           | 71.43% | 11.43%                   | .      | .      | .     |

. Indicates 0%

<sup>(1)</sup> There is only Series A at Round A, hence no comparison to other Series

The table shows the order of seniority of all outstanding share series, and common stock, measured at the time each funding round is closed. Specifically, we show how the share series issued in the latest (most recent) funding round compares, in terms of seniority, to all the other outstanding series (and common stock) upon the closing of this funding round. Panel A shows the frequency with which the latest issued share series is (1) 'the most investor friendly', as compared to the other outstanding (i.e. prior) series at the time of the latest round; (2) 'the least investor friendly', as compared to the other outstanding (i.e. prior) series at the time of the latest round; (3) the 'same as all the other outstanding series' at the time of the latest round; or (4) 'mixed', meaning the latest series' contract does not fall into any of the three categories above. 'Most investor friendly' means at least one term is more investor friendly to the series holder, and no term is less investor friendly. 'Least investor friendly' means at least one term is less investor friendly to the series holder, and no term is more investor friendly. Panel B shows a seniority comparison between the share series issued in the latest (most recent) funding round and common stock. We compare the frequency with which each of the eight observed rights granted to the latest share series are senior (as in, more investor friendly) compared to the rights granted to common stock. Panel C displays the opposite: how frequently are the terms granted to the latest share series junior (as in, less investor friendly) compared to common stock.

**Table 7**  
Share Rights Distributions Across Investors and Funding Rounds.

| Panel A. Equal Rights              |        |        |        |        |        |        |        |        |
|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Terms                              | CD     | LO     | LM     | LP     | VT     | RD     | ADP    | IPO    |
| Round B                            | 98.48% | 76.77% | 95.96% | 92.93% | 94.95% | 97.47% | 92.42% | 99.49% |
| Round C                            | 98.68% | 66.89% | 94.70% | 90.73% | 89.40% | 95.36% | 89.40% | 98.68% |
| Round D                            | 96.88% | 55.21% | 88.54% | 86.46% | 83.33% | 95.83% | 87.50% | 95.83% |
| Round E                            | 94.55% | 49.09% | 89.09% | 87.27% | 76.36% | 94.55% | 76.36% | 96.36% |
| Round F                            | 88.57% | 42.86% | 77.14% | 71.43% | 65.71% | 85.71% | 71.43% | 94.29% |
| Panel B. Later Series Are Senior   |        |        |        |        |        |        |        |        |
| Terms                              | CD     | LO     | LM     | LP     | VT     | RD     | ADP    | IPO    |
| Round B                            | 1.01%  | 22.73% | 3.54%  | 4.55%  | .      | 2.02%  | 7.07%  | 0.51%  |
| Round C                            | 0.66%  | 32.45% | 3.97%  | 5.30%  | 1.32%  | 3.31%  | 9.27%  | 0.66%  |
| Round D                            | 1.04%  | 44.79% | 8.33%  | 9.38%  | 1.04%  | 3.13%  | 9.38%  | 3.13%  |
| Round E                            | 1.82%  | 50.91% | 7.27%  | 5.45%  | .      | 1.82%  | 16.36% | 1.82%  |
| Round F                            | 2.86%  | 54.29% | 11.43% | 20.00% | .      | 11.43% | 11.43% | 2.86%  |
| Panel C. Earlier Series Are Senior |        |        |        |        |        |        |        |        |
| Terms                              | CD     | LO     | LM     | LP     | VT     | RD     | ADP    | IPO    |
| Round B                            | 0.51%  | 0.51%  | 0.51%  | 2.53%  | 5.05%  | 0.51%  | 0.51%  | .      |
| Round C                            | 0.66%  | .      | 0.66%  | 2.65%  | 5.96%  | 0.66%  | 0.66%  | .      |
| Round D                            | 2.08%  | .      | .      | 3.13%  | 2.08%  | .      | .      | .      |
| Round E                            | 1.82%  | .      | .      | 7.27%  | 7.27%  | .      | .      | .      |
| Round F                            | 2.86%  | 2.86%  | 5.71%  | 8.57%  | 11.43% | .      | 5.71%  | .      |
| Panel D. Mixed                     |        |        |        |        |        |        |        |        |
| Terms                              | CD     | LO     | LM     | LP     | VT     | RD     | ADP    | IPO    |
| Round B                            | .      | .      | .      | .      | .      | .      | .      | .      |
| Round C                            | .      | 0.66%  | 0.66%  | 1.32%  | 3.31%  | 0.66%  | 0.66%  | 0.66%  |
| Round D                            | .      | .      | 3.13%  | 1.04%  | 13.54% | 1.04%  | 3.13%  | 1.04%  |
| Round E                            | 1.82%  | .      | 3.64%  | .      | 16.36% | 3.64%  | 7.27%  | 1.82%  |
| Round F                            | 5.71%  | .      | 5.71%  | .      | 22.86% | 2.86%  | 11.43% | 2.86%  |

. Represents 0%.

The table shows how the eight observed contractual share rights are distributed among investors in each funding round. We identify five distribution patterns: (1) in Panel A, all series are given the same rights ('Equal Rights'); (2) in Panel B, later series have rights more senior, or at least as senior, as successive series ('Later Series Are Senior'); (3) in Panel C, earlier series have rights more senior, or at least as senior, as successive series ('Earlier Series Are Senior'); and (4) in Panel D, any other right allocation strategies that do not fall into the three prior categories ('Mixed'). A right given to a series is 'senior' to other series if it grants the investors of this series better protection over their investments as compared to other series.

variation in contractual terms: the majority of financings have the same terms across eight key cash flow and control rights. Where contractual terms do differ, they are more investor-friendly. We label the initial Series A contract with identical rights across all eight rights the default contract.

We then track the evolution of contractual terms at each funding round. To do so, we classify the evolution along three dimensions. The diagonal analysis compares the original share rights given to investors of each funding round at the time of the closing of each respective funding round. The vertical dimension analyses whether the rights of existing share classes are changed upon the introduction of new share classes at the closing of subsequent funding rounds. The horizontal analysis compares the rights of all existing share classes at a given point in time.

Diagonally, contract terms are noticeably sticky over rounds. Exceptions to this are the non-default contracts, which exhibit a tendency to revert back to default values in subsequent funding rounds. Vertically, existing rights rarely get revised when new series are issued, irrespective of the funding stage the startups are in. Perhaps surprisingly, we find that when revisions do happen, old series do not always suffer reductions in cashflow or control rights. In some cases, the contract revisions even result in more senior terms. Horizontally, we find that the rights associated with the latest funding round are the most investor-friendly in only about one third of the companies (relative to other existing shares that had been issued in earlier rounds). In many cases, the terms associated with all series of preferred shares are the same.

In the case of successful startups, the preferred shares will voluntarily convert into common stock, thereby sweeping away any differential contractual rights. In such cases (which will include most unicorns) the headline post-money valuation based on the most recent round of preferred shares will therefore be close to the true economic value.

Analyzing contractual share rights and their evolution in privately-held companies presents a variety of data challenges. These involve, but are not limited to, the manual interpretation of legal documents, extraction of key contractual terms, and the merging of data from multiple sources to match information on entrepreneurs and investors. To facilitate future research on this important topic, the paper addresses these challenges, and proposed solutions, by documenting all data sources and data collection steps, our efforts in verifying data quality, as well as any potential data-related shortcomings. We hope these can provide a roadmap in handling contractual data for future researchers, and create more transparency in the field of share rights data.

## Appendix A. Database comparison

The table shows comparisons of three commercial startup databases as well as the sample we use for the analyses in this paper. The commercial databases are Pitchbook, Crunchbase and the ‘Genesis’ database provided by Lagniappe Labs. Panel A reports general information on the number of companies and funding rounds in each database, as well as exit indicators and fundraising numbers. Panel B provides information on the availability of contractual share rights in each database. We provide the numbers for the commercial databases for our observation period, i.e. for all startups that raised their first funding round between 2001 and 2018, but as compiled as of Jan. 2022. At the bottom of the table in footnotes, we provide detailed individual explanations for the numbers. This is necessary because none of the datasets are complete in the way they provide comprehensive information for all companies listed on them. We therefore provide selected information for subsamples within the datasets, in order to create more transparency and detail in the reported numbers and in describing the datasets.

**Appendix Table 1**

Comparison of Databases and Sample Construction

| Panel A. Sample Overview   |                        |                       |                                |                              |                              |
|--|------------------------|-----------------------|--------------------------------|------------------------------|------------------------------|
|  | Pitchbook              | Crunchbase            | Lagniappe Labs (Genesis)       |                              | 300-Sample Used for Analyses |
| Sample Comparison 2001–2021  |                        |                       |                                |                              |                              |
| US VC-Backed Startups (No.)  | 54,088 <sup>(1)</sup>  | 21,704 <sup>(1)</sup> | 19,943 <sup>(2)</sup>          |                              | 300                          |
| Individual Funding Rounds Covered (No.)  | 224,979 <sup>(3)</sup> | 71,419 <sup>(3)</sup> | 30,767 (11,416) <sup>(4)</sup> |                              | 1010                         |
| Exit Indicators  |                        |                       |                                |                              |                              |
| Sample   | 51,916 <sup>(5)</sup>  | 17,410 <sup>(5)</sup> | $N = 6924^{(4)}$               | $N = 2995^{(4)}$             |                              |
| IPO Exits (%)  | 3%                     | 5%                    | 6%                             | 6%                           | 16%                          |
| M&A Exits (%)  | 22%                    | 22%                   | 13%                            | 11%                          | 31%                          |
| Closed/Chapter 11 (%)  | 24%                    | 12%                   | 2%                             | 2%                           | 28%                          |
| Active as of Year-End 2021 (%)   | 51%                    | 61%                   | 79%                            | 81%                          | 25%                          |
| Fundraising and Funding Rounds   |                        |                       |                                |                              |                              |
| Avg. Funding Rounds per Startup (No.)  | 4.16                   | 3.29                  | n/a <sup>(6)</sup>             |                              | 3.36                         |
| <i>Median</i>  | 2                      | 3.00                  |                                |                              | 3.00                         |
| Avg. Funding Vol. per Funding Round (\$mn.)                                      | 18.41                  | 11.25                 | n/a <sup>(6)</sup>             |                              | 59.78                        |
| <i>Median</i>  | 6.42                   | 5.00                  |                                |                              | 15.48                        |
| Avg. Funding Vol. per Startup (\$mn.)  | 41.58                  | 45.95                 | n/a <sup>(6)</sup>             |                              | 217.13                       |
| <i>Median</i>  | 10.50                  | 14.11                 |                                |                              | 61.7                         |
| Panel B. Contract Terms Overview   |                        |                       |                                |                              |                              |
|  | Pitchbook              | Crunchbase            | Lagniappe Labs (Genesis)       | 300-Sample Used for Analyses |                              |
| Sample Comparison 2001–2021  |                        |                       |                                |                              |                              |
| Startups w/Contract Terms Data for at least one Funding Round (% of Full Sample) | n/a <sup>(7)</sup>     | 0%                    | 37%                            | 100%                         |                              |
| Equity Funding Rounds w/Contract Terms Data (% of Full Sample)                   | n/a <sup>(7)</sup>     | 0%                    | n/a                            | 88%                          |                              |
| Contract Terms available at the time of each Series Issue?                       | Yes                    | No                    | No                             | Yes                          |                              |
| Contract Terms available for each preceding Series at Time of Series Issue?      | No                     | No                    | No                             | Yes                          |                              |
| Contract Terms Covered   |                        |                       |                                |                              |                              |
| (1) Dividend   |                        |                       |                                |                              |                              |

(continued on next page)

**Appendix Table 1** (continued)

| Panel B. Contract Terms Overview            |           |            |                             |                                    |
|---|-----------|------------|-----------------------------|------------------------------------|
|   | Pitchbook | Crunchbase | Lagniappe Labs<br>(Genesis) | 300-Sample<br>Used for<br>Analyses |
| - Contractual or Not                        | No        | No         | No                          | Yes                                |
| - Dividend Rate                             | Yes       | No         | Yes                         | No                                 |
| - Cumulative or Not                         | Yes       | No         | Yes                         | No                                 |
| (2) Liquidation Preference                  |           |            |                             |                                    |
| - Liquidation Payment Order for each Series | No        | No         | No                          | Yes                                |
| - Liquidation Multiplier                    | Yes       | No         | Yes                         | Yes                                |
| (3) Liquidation Participation               |           |            |                             |                                    |
| - Participating or Not                      | Yes       | No         | Yes                         | Yes                                |
| - Participation Cap                         | No        | No         | Yes                         | Yes                                |
| (4) Anti-Dilution Protection                |           |            |                             |                                    |
| - Anti-Dilution Formally Adopted            | Yes       | No         | Yes                         | Yes                                |
| - Protection Conditional or Not             | No        | No         | No                          | Yes                                |
| (5) Redemption                              |           |            |                             |                                    |
| - Redeemable or Not                         | Yes       | No         | No                          | Yes                                |
| - Redeemable jointly w/other Series         | No        | No         | No                          | Yes                                |
| (6) General Voting Rights                   |           |            |                             |                                    |
| - General Voting Rights Available           | Yes       | No         | No                          | Yes                                |
| - Number of Votes per Share                 | No        | No         | No                          | Yes                                |
| (7) Board Voting Rights                     |           |            |                             |                                    |
| - Board Voting Rights Available             | Yes       | No         | No                          | No                                 |
| - Number of Board Votes per Share           | No        | No         | No                          | No                                 |
| (8) IPO Ratchet                             |           |            |                             |                                    |
| - IPO Ratchet Available                     | No        | No         | No                          | Yes                                |

<sup>1</sup> As of February 2022, all US VC-backed startups whose first equity funding round was issued between 01/2001 and 12/2018.

<sup>2</sup> Total number of available US VC-backed startups in database as of 01/2022. Total number as of September 2019 (the end of our data collection period) was 18,832.

<sup>3</sup> Total number of full Venture funding (Seed, Series A, B etc.) rounds issued by sample startups between 01/2001 and 01/2022.

<sup>4</sup> We apply two main filters to determine the sample used for our analyses, based on all available companies in the Genesis database. Following the first filter (at least one CoI available per company), the number of startups is reduced from 18,832 to 6924. Following our second main filter (at least one CoI available for each funding round per company), the number is reduced to 3110; 2995 of those had their first equity funding round between 01/2001 and 12/2018.

<sup>5</sup> Exit data is not available for every company in database, hence the reduced sample size.

<sup>6</sup> Data not available for (bulk) download across database companies; company profiles must be accessed one-by-one for individual information.

<sup>7</sup> Data cannot be provided by Pitchbook in-house research.

## Appendix B. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jcorpfin.2022.102222>.

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