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# Do Investors Overvalue Startups? Evidence from the Junior Stakes of Mutual Funds

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Discussed by Clemens Sialm  
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# From unicorns to unicorpses: Why billion-dollar startups and even VC firms keep imploding

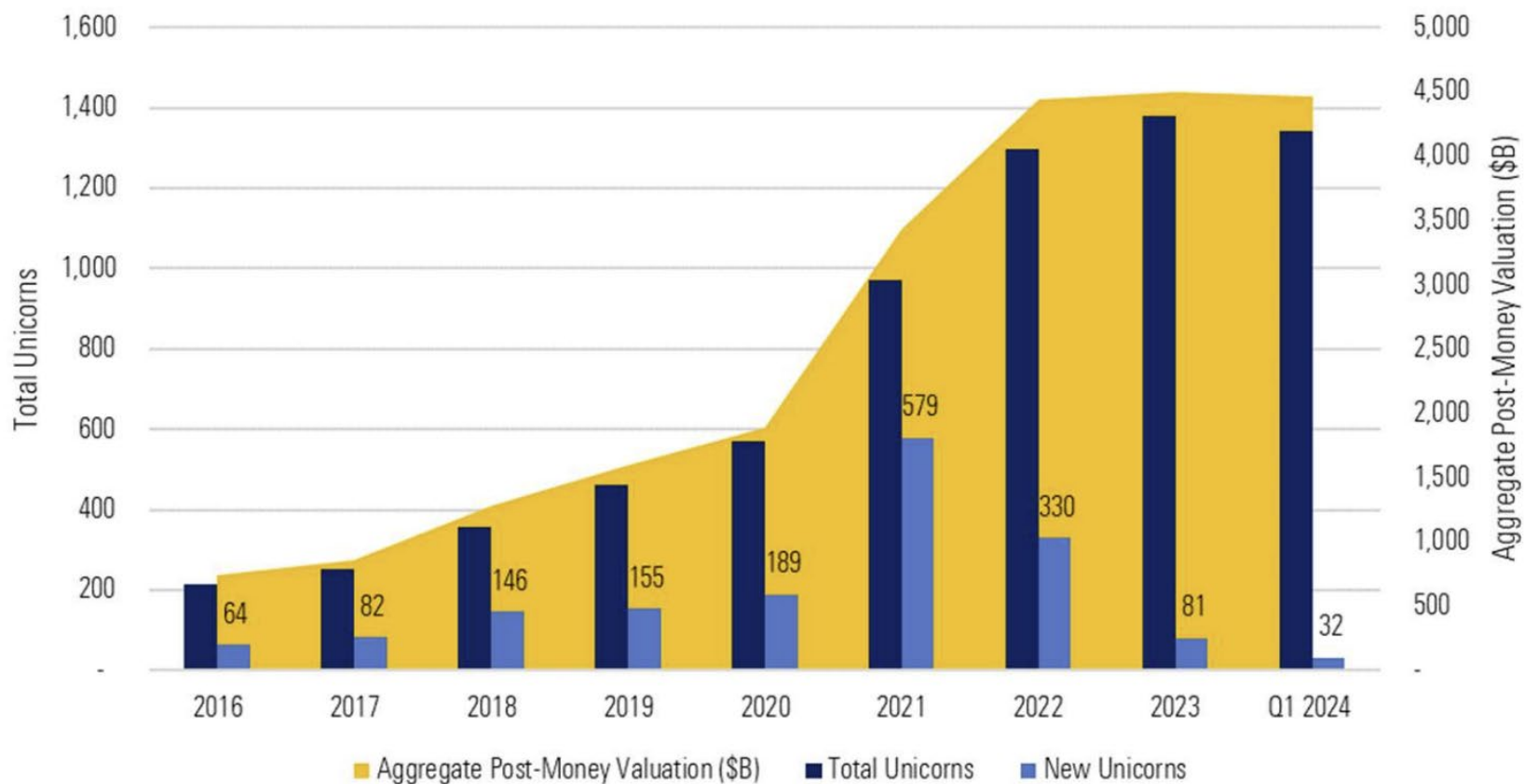
The Silicon Valley funding pipeline is under pressure like never before.

BY JESSICA MATHEWS

January 25, 2024 at 4:30 AM CST



**Exhibit 3: Growth of Global Unicorns by Number and Assets**

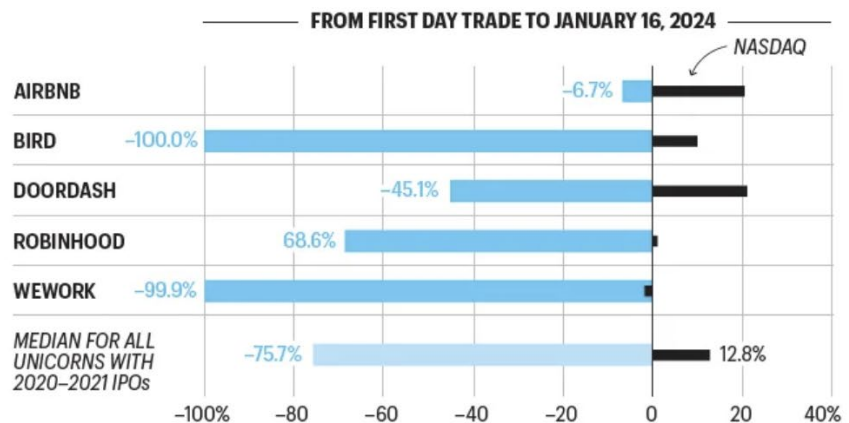
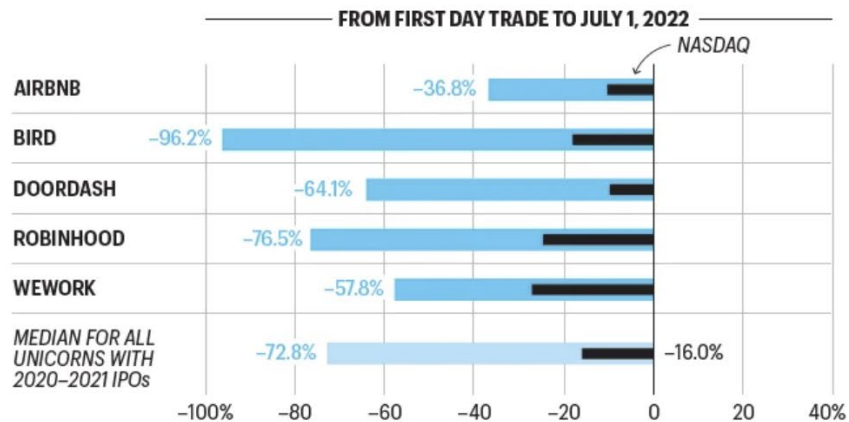


Source: Morningstar. Data as of March 31, 2024.

## A POST-IPO WIPEOUT

Unicorns that went public during the boom years of 2020 and 2021 were hit particularly hard when rising rates clobbered stocks in early 2022. Eighteen months later, most still lag the Nasdaq. Below, the performance of five well-known examples.

### CHANGE IN UNICORN MARKET CAPITALIZATIONS



SOURCE: S&P GLOBAL

Charts show changes in market capitalization for selected unicorns

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# Summary

- The authors study the reported valuations of startup securities by mutual funds and compare them to fair values taking into account the complex security structure of startup firms.
- Commonly used post-money valuation ignores the differences in values between the most recently issued preferred stock and the rest.
- Contingent-claim valuation methodology is based on Metrick and Yasuda (2010, 2021) and related to Gornall and Strebulaev (2020).

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# Relevance

- Correct valuations of holdings are crucial for mutual funds as they are traded daily at their NAVs.
  - Deviations from fair values lead to cross-subsidization across fund investors and can lead to destabilizing fund flows.
- Mutual funds are not the “natural” investors in private securities for various reasons:
  - Open-end mutual funds allow investors to trade on a daily basis, which is at odds with the illiquid nature of private firms.
  - Mutual funds often do not have the expertise to evaluate these private firms.
  - Mutual funds typically do not have resources to add value to private firms.

# Payoff Diagrams by Seniority

Figure 2: Exit Diagrams

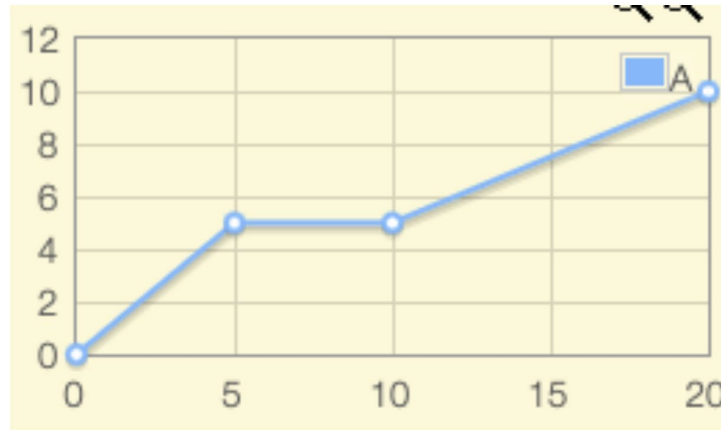


Figure 2a. Exit Diagram for Series A

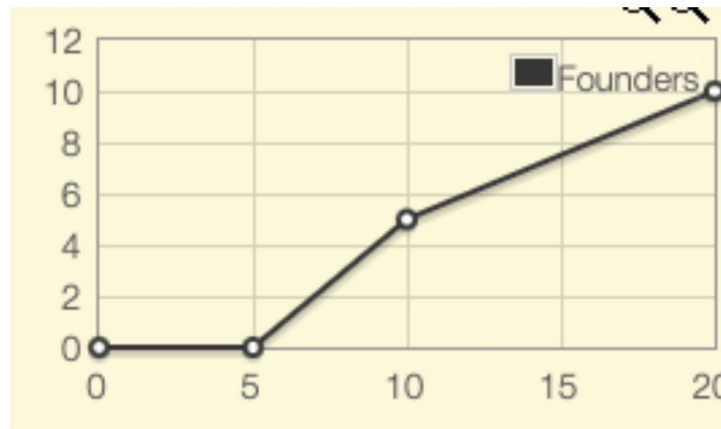


Figure 2b. Exit Diagram for Founders

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# Main Results

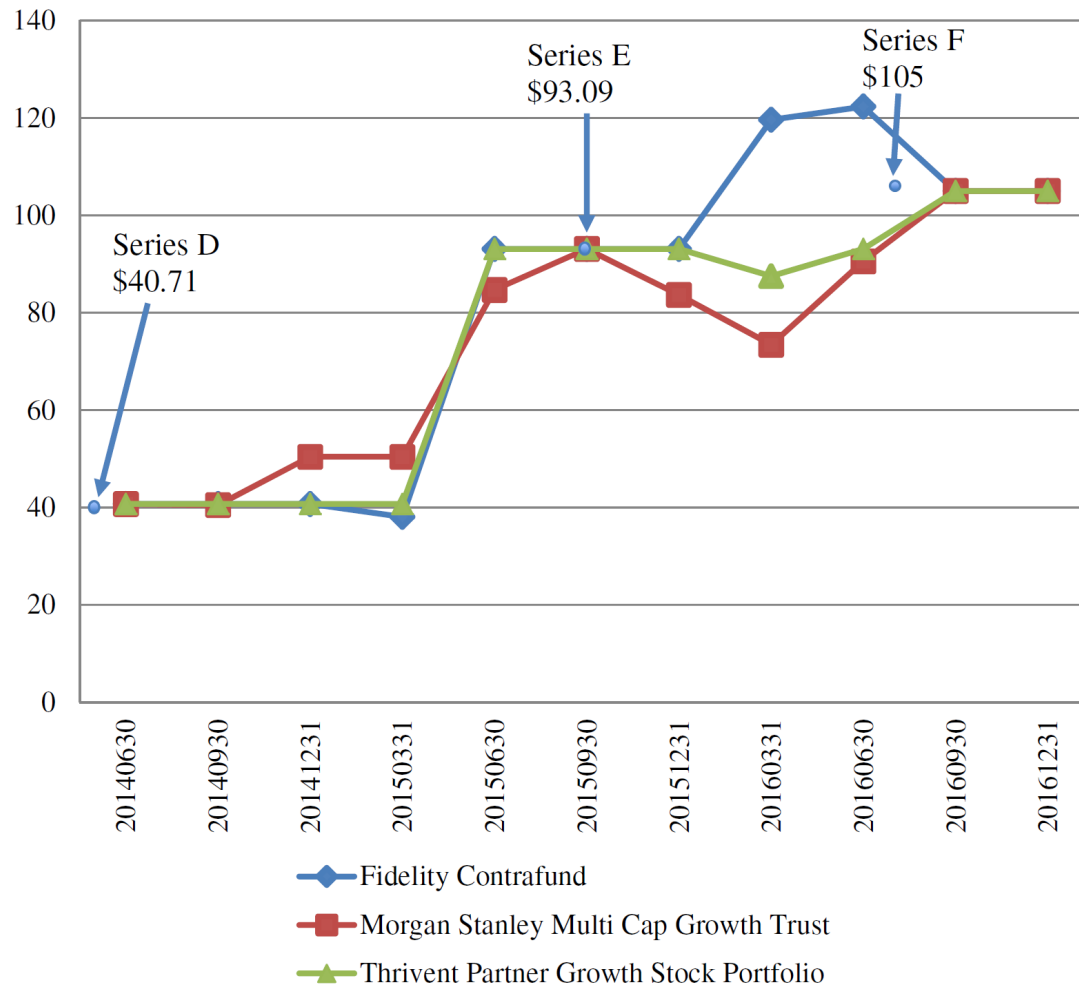
- Mutual funds often value their junior securities close to par with the senior securities just issued.
- Mutual funds value their securities at 43.3% above fair values for primary transactions and at 138.9% above fair values for secondary transactions.
- Results are most consistent with naivete and lack of knowledge.



**Table 3: Mutual Fund Valuation Relative to Fair Value**

In Panel A, for each family-security-pair, we compute the valuation difference between fund family's reported price and the model-implied fair value of an early round security at the time of the new round (*DevPrc*). We report the number of firms, security pairs, families, and family-security pairs, as well as the summary statistics for *DevPrc*, in the full sample and subsamples for primary and secondary market purchases. Panel B reports similar statistics at the time of purchase, i.e., the valuation difference between the family's first reported price and the model-implied fair value at that time (based on the latest funding round). Appendix A provides a detailed definition for each variable.

Sample	No. Firm	No. Security Pair	No. Family	No. Family-Security Pair	Mean	Std.Dev.	10%	25%	Median	75%	90%
<b>Panel A: At the Time of a New Round</b>											
All	65	214	40	520	0.678	1.131	-0.055	0.106	0.424	0.775	1.437
Primary	61	167	39	387	0.433	1.077	-0.140	0.027	0.282	0.499	0.699
Secondary	19	59	19	133	1.389	0.973	0.437	0.696	1.190	1.521	3.101
<b>Panel B: At the Time of Purchase</b>											
All	54	123	37	305	0.497	0.856	-0.005	0.000	0.000	1.021	1.362
Primary	52	77	36	193	0.031	0.224	-0.082	0.000	0.000	0.000	0.003
Secondary	20	46	19	112	1.300	0.944	0.478	0.719	1.190	1.365	3.557

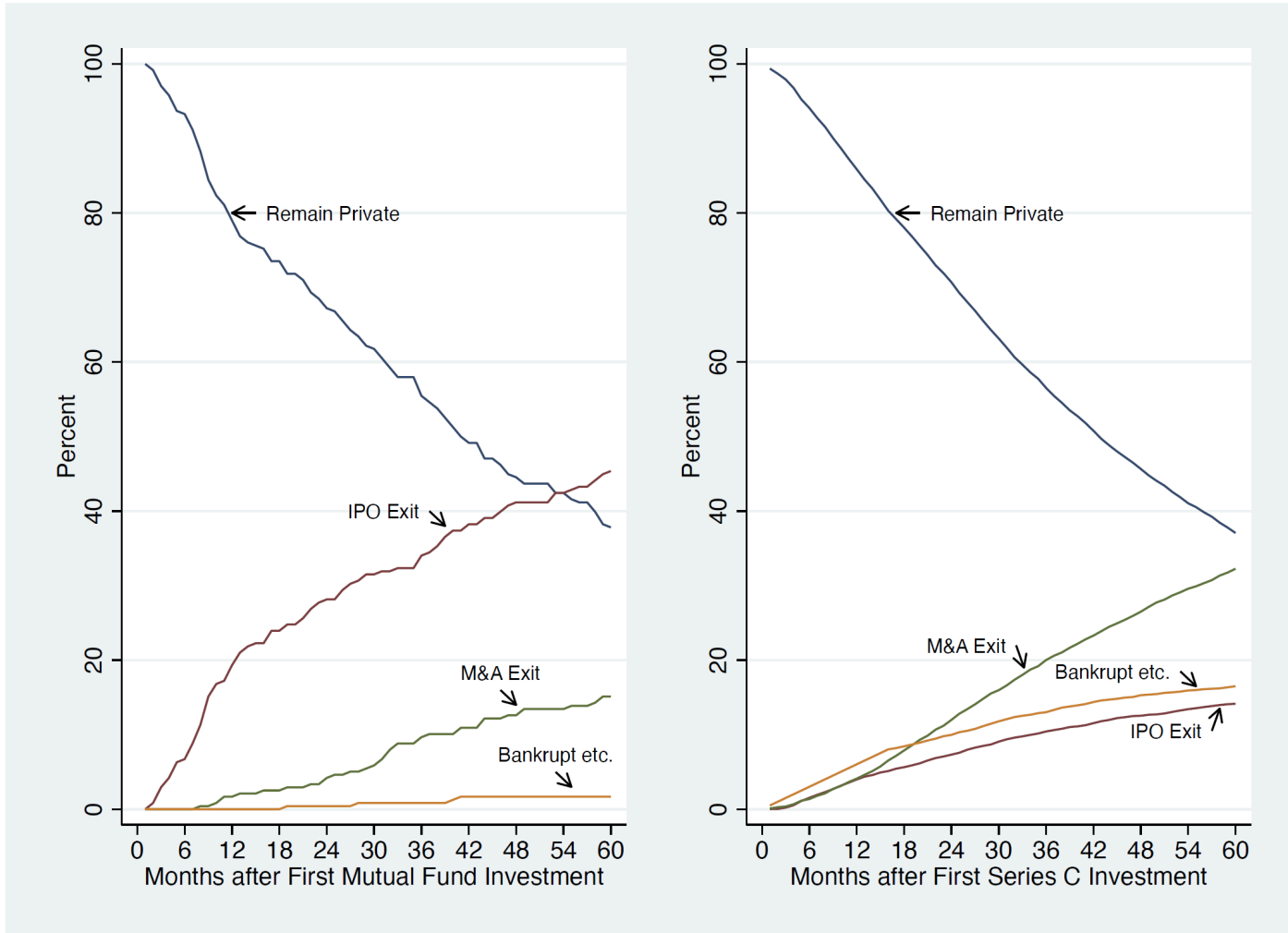


**Figure 1.** Airbnb Series D valuations reported by three mutual fund families. The Series D round for Airbnb was issued at \$40.71 in April 2014. The lines depict the quarterly valuations for Airbnb by three mutual funds in their quarterly reports.

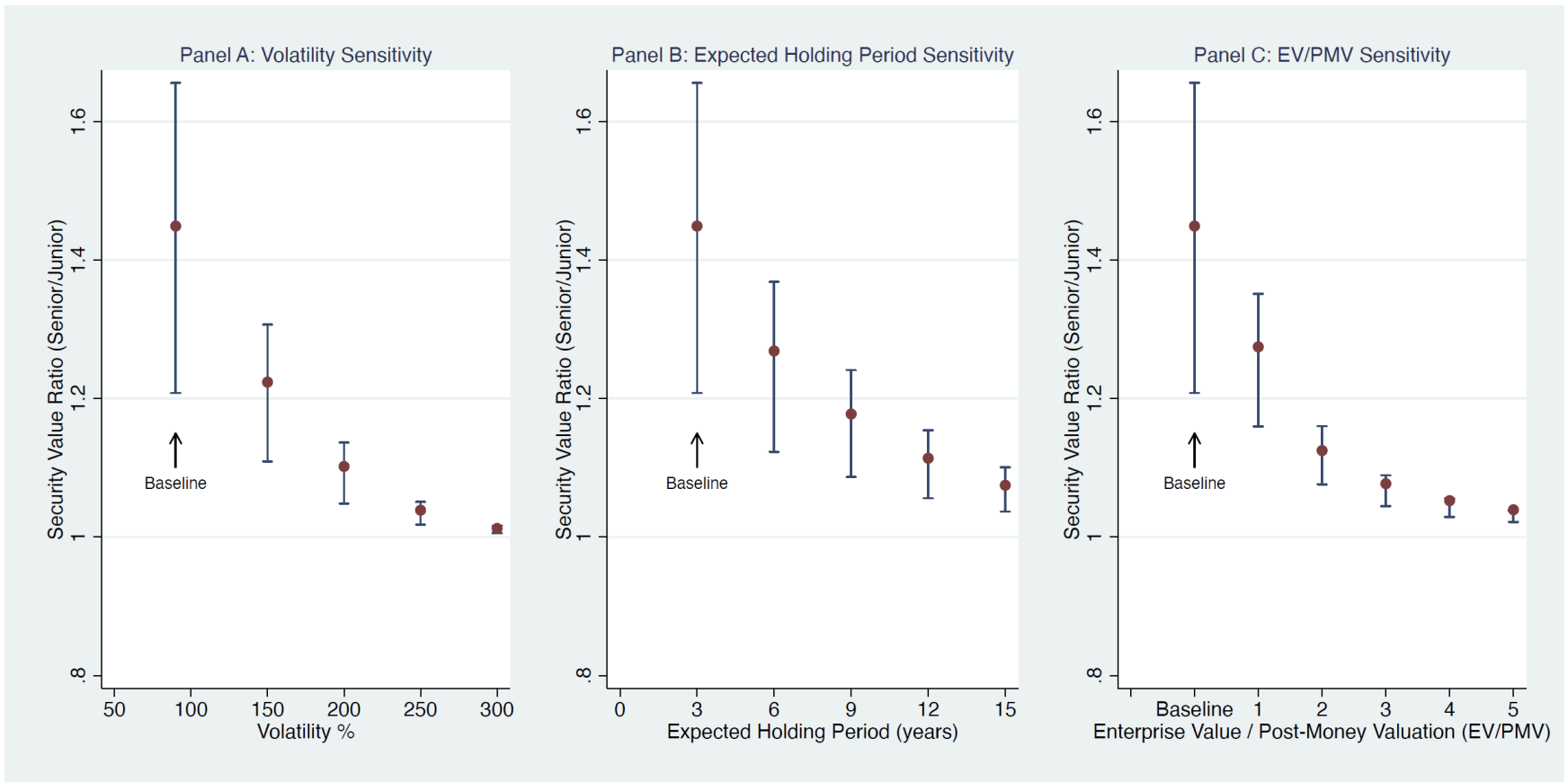
# Impact of Assumptions

- Authors estimate fair values using a contingent-claims method (Black-Scholes):
  - Volatility: 90%
    - May be too high for firms held by mutual funds.
  - Expected holding period: 3/4/5 years
    - May differ for firms held by mutual funds.
  - Random expiration with exponential distribution
    - Exits (i.e., IPOs, M&As, bankruptcy) are related to valuation and are not exponentially distributed.
  - Purchase price of latest funding round is fair
    - Issuer may need to offer significant discounts to compensate for the illiquidity of the securities.

# Exit Outcomes of Private Companies



# Sensitivity Analyses



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# Determinants of Mutual Fund Overvaluation

- Mutual fund overvaluation is related to
  - Mutual fund experience in private assets
  - Down rounds
  - Secondary purchases

# Determinants of Mutual Fund Overvaluation

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Ln(PE Experience)	-0.290*							-0.311*	-0.321*
	(-1.82)							(-1.72)	(-1.71)
Ln(PE Value)		-0.017	-0.021					0.021	0.017
		(-0.78)	(-0.92)					(1.18)	(0.96)
%Firm Round Size		-0.111						-0.089	
		(-0.41)						(-0.33)	
%Firm Round Size-Early			0.047						0.128
			(0.17)						(0.43)
%Firm Round Size-New			-0.429						-0.506
			(-1.31)						(-1.52)
Firm Weight				0.217*				0.125	0.119
				(1.81)				(1.44)	(1.38)
Down Round Adjustment					-0.398**		-0.372**	-0.356*	-0.366*
					(-2.28)		(-2.00)	(-1.70)	(-1.85)
Down Round						-0.417***	-0.400***	-0.282***	-0.282***
						(-3.35)	(-2.98)	(-3.29)	(-2.96)
Secondary	1.018***	1.079***	1.076***	1.114***	1.048***	1.046***	1.038***	1.027***	1.018***
	(3.36)	(3.38)	(3.37)	(3.51)	(3.32)	(3.27)	(3.28)	(3.27)	(3.24)
Round Gap	-0.014	-0.033	-0.032	-0.044	-0.026	-0.030	-0.027	-0.020	-0.017
	(-0.30)	(-0.66)	(-0.64)	(-0.78)	(-0.50)	(-0.56)	(-0.52)	(-0.46)	(-0.39)
Reporting Gap	0.050	0.021	0.022	0.037	0.039	0.028	0.028	0.054	0.057
	(0.91)	(0.33)	(0.35)	(0.65)	(0.69)	(0.48)	(0.48)	(0.84)	(0.88)
Constant	1.177**	0.504*	0.509*	0.343**	0.386**	0.409**	0.412**	1.134*	1.163*
	(2.03)	(1.91)	(1.91)	(2.06)	(2.20)	(2.26)	(2.27)	(1.94)	(1.92)
Obs	419	419	419	419	419	419	419	419	419
R-squared	0.165	0.142	0.144	0.146	0.143	0.145	0.149	0.177	0.180

# Secondary Purchases

- Large overvaluation of secondary purchases is puzzling.
  - Naivete and lack of knowledge would need to be very significant since these are transaction prices and not just accounting values.
  - Conflicts of interest and strategic cross-subsidization could explain these inflated values.
    - From whom do the funds purchase these securities?
    - Are the securities purchased from different segments of the same financial conglomerate?
    - Do the fund families receive some benefits by purchasing these securities at inflated prices?



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# Additional Comments

- Including more recent data would capture the experience in different market environments.
    - Includes both the boom and the bust in unicorns
  - Analyzing the long-term fund returns would provide an indication of the value added of the private holdings.
    - Do funds with higher fraction of unicorns perform worse?
    - Do funds with higher fraction of junior securities perform worse?
  - Studying fund flows could help our understanding of investor and fund manager behavior.
    - Are fund flows related to the overpricing of securities?
    - Do funds adjust valuations when they have large in- and outflows?
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# Conclusion

- Paper sheds fascinating new light on the valuation of startup companies by mutual funds.
- The magnitude of the overvaluation is economically very significant.
- I look forward to discussing the next paper in the authors' trilogy at a future ABFER meeting.