Discussion of "Equilibrium Value and Profitability Premiums"

by **Hengjie Ai**, Jun E. Li, and Jincheng Tong

Dan Su

CKGSB

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This Paper

- **Research question**: joint explanation of value and gross profitability premiums
  - a long-standing challenge in production-based asset pricing literature
  - firm-level productivity is the only source of exogenous variation

Panel A: Market-to-book sorted portfolios

	Value	2	3	4	Growth	Growth-Value
MB	0.66	1.18	1.77	2.81	5.99	3.76
GP/A	0.23	0.28	0.32	0.36	0.38	0.06
I/K	0.07	0.09	0.11	0.13	0.16	0.09
$E[R^e](\%)$	10.16	7.59	7.57	6.96	6.87	$\boxed{-3.30}$
(t)	(3.98)	(3.41)	(3.80)	(3.31)	(3.00)	(-1.75)
Sharpe Ratio	0.53	0.46	0.49	0.44	0.38	-0.21
α^{CAPM}	7.13	5.41	5.50	4.45	3.95	-3.17
(t)	(4.70)	(4.27)	(6.23)	(6.50)	(5.48)	(-1.58)
α^{FF3}	3.67	2.93	4.24	4.06	5.43	1.75
(t)	(5.40)	(4.67)	(6.72)	(6.54)	(11.09)	(2.45)
β^{CAPM}	1.05	0.92	0.90	0.97	1.03	-0.02
(t)	(24.71)	(24.58)	(39.16)	(57.39)	(61.85)	(-0.33)

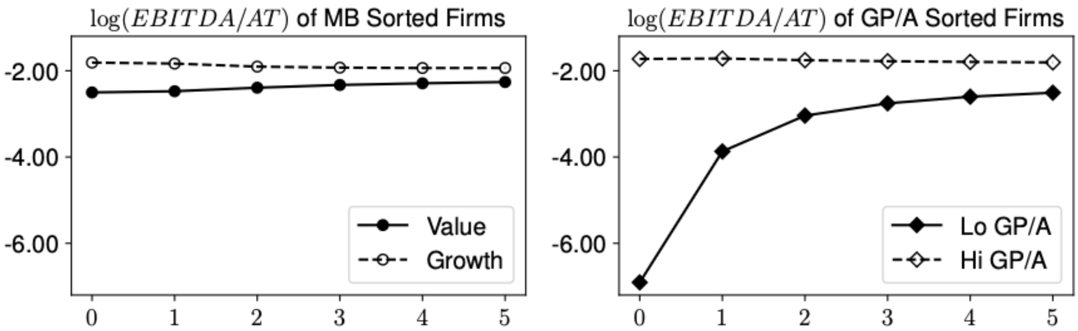
Panel B: Gross profitability sorted portfolios

	Low	2	3	4	High	High-Low
MB	1.51	1.34	1.59	1.88	2.30	0.51
GP/A	0.06	0.19	0.31	0.45	0.70	0.65
I/K	0.08	0.09	0.10	0.11	0.12	0.04
$E[R^e](\%)$	4.68	5.71	7.65	6.90	9.20	$\boxed{4.51}$
(t)	(2.15)	(2.62)	(3.54)	(3.01)	(4.19)	(2.85)
Sharpe Ratio	0.25	0.32	0.43	0.37	0.52	0.36
α^{CAPM}	2.55	3.11	4.94	3.93	6.89	4.34
(t)	(2.56)	(3.41)	(8.14)	(5.17)	(7.20)	(2.68)
α^{FF3}	2.10	2.39	4.95	4.94	7.97	5.87
(t)	(2.20)	(2.86)	(8.15)	(7.31)	(9.34)	(4.00)
β^{CAPM}	0.91	0.98	1.00	1.04	0.94	0.03
(t)	(38.68)	(39.81)	(61.06)	(54.86)	(42.22)	(0.63)

This Paper: A New Framework

- **Key elements**
  - *two-factor productivity structure*: permanent and transitory components
  - *two types of aggregate risk*: aggregate TFP shocks and depreciation shocks
- **Key mechanism**:
  - high-profitability firms: transitory shocks, capital utilization, exposure to aggregate depreciation shocks
  - growth firms: permanent shocks, investment, exposure to aggregate TFP shocks
- **Empirical and quantitative evidence**:
  - suggestive evidence
  - quantitative asset pricing tests
  - model-implied economic depreciation shocks

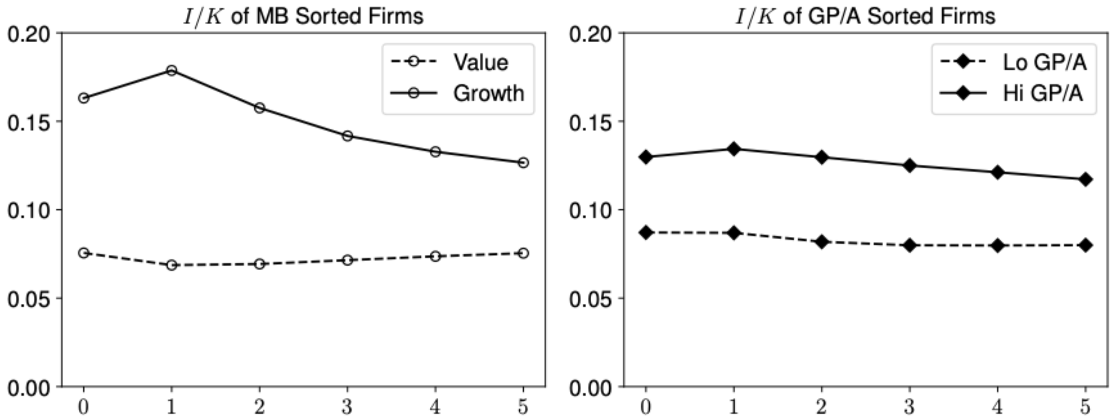
Comment #1: Suggestive Evidence



- **growth v.s. value**: 0.69 $\rightarrow$ 0.64 $\rightarrow$ ... $\rightarrow$ 0.33
- **high v.s. low profitability**: 5.18 $\rightarrow$ 2.15 $\rightarrow$ ... $\rightarrow$ 0.70
- use both EBITDA and OP (exc. XSGA)

- strategic behaviors of customer capital expenses (Dou, Ji, and Wu 2021 RFS)
- why not directly look at TFP?

COMMENT #1: SUGGESTIVE EVIDENCE



- **growth v.s. value**: 9% → 12% → ... → 4%
- **high v.s. low profitability**: 4% → 5% → ... → 4%

- similar exposure to permanent shocks; the offsetting channel needs to be large (risk aversion 55)
- intangible capital investment? Kazemi (2025) "Intangible Investment, Displacement Risk, and the Value Discount" two-capital v.s. two-productivity?

Comment #2: Key Challenge Still There

- **Boosting value premium simultaneously weakens profitability premium, and vice versa.**

Panel A: Market-to-book sorted portfolios

	Value	2	3	4	Growth	Growth-Value
V/K	1.22	1.37	1.56	1.76	1.89	0.67
Π/K	0.15	0.16	0.17	0.20	0.18	0.03
I/K	0.06	0.09	0.13	0.17	0.20	$\boxed{0.14}$
Returns and CAPM Alphas						
$E[R^e](\%)$	5.78	5.74	5.20	4.72	4.15	$\boxed{-1.63}$
Sharpe Ratio	0.39	0.38	0.36	0.30	0.25	-0.67
α	0.62	0.22	0.09	-0.84	-1.73	-2.35
Risk Exposures to Fundamental Shocks						
ε^{ζ}	0.45	0.45	0.29	0.05	-0.03	-0.47
ε^{θ}	$\boxed{-13.56}$	-13.84	-13.28	-14.39	$\boxed{-15.11}$	-1.56

Panel B: Gross profitability sorted portfolios

	Low	2	3	4	High	High-Low
V/K	1.40	1.76	1.39	1.67	1.49	0.08
Π/K	0.10	0.13	0.16	0.21	0.27	0.17
I/K	0.09	0.18	0.09	0.15	0.11	$\boxed{0.02}$
Returns and CAPM Alphas						
$E[R^e](\%)$	4.28	4.60	5.50	5.77	6.64	$\boxed{2.37}$
Sharpe Ratio	0.47	0.37	0.38	0.32	0.30	0.17
α	1.17	0.19	0.27	-0.55	-1.11	-2.28
Risk Exposures to Fundamental Shocks						
ε^{ζ}	$\boxed{0.37}$	0.29	0.38	0.29	$\boxed{0.33}$	-0.04
ε^{θ}	-7.54	-11.08	-13.34	-16.84	-20.51	-12.97

- Growth-Value I/K in the data: 0.09
- High-Low Profitability I/K in the data: 0.04
- Growth-Value Premium in the data: -3.30%
- High-Low Profitability Premium in the data: 4.51%

Comment #3: Key Identification Moments

- Permanent component X and transitory component Z should be difficult to separate from each other

$$Y_{j,t} = A_t^{1-\alpha\nu}\left[\left(X_{j,t}\cdot Z_{j,t}\right)^{1-\nu}\left(u_{j,t}K_{j,t}\right)^{\nu}\right]^{\alpha} L_{j,t}^{1-\alpha}$$

Panel B: Estimated Parameters

Parameter	Symbol	Value	S.E.
Utilization elasticity parameter	λ	0.098	0.002
Capital adj. cost parameter	h	3.022	0.018
Depreciation level parameter	δ_0	0.070	0.004
Utilization slope parameter	δ_u	0.235	0.064
Persistence of depreciation shock	ρ_θ	0.105	0.033
Volatility of depreciation shock	σ_θ	0.476	0.005
Volatility of idio. permanent productivity shock	σ_X	0.176	0.002
Persistent of idio. transitory productivity shock	ρ_Z	0.618	0.003
Volatility of idio. transitory productivity shock	σ_Z	0.660	0.007
Fixed Cost	F	0.012	0.001

Comment #3: Key Identification Moments

- "The 10 estimated parameters are estimated using 36 moments listed in Tables 3 and 4"
- "the investment rates of market-to-book and profitability sorted portfolios help identify firm-level productivity process parameters (σ_X, ρ_Z, and σ_Z), as the investment rate spreads across these portfolios reveal the two-factor productivity structure shown in Figure 2"
- "quantitatively, firms' market-to-book ratio is primarily determined by the permanent component, X, and the transitory component Z mainly determines the gross profitability"
- it will be great if the authors could explain more on which data moments are particularly informative in identifying σ_X, ρ_Z, and σ_Z

Comment #3: Key Identification Moments

Panel B: Estimated Parameters

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Fixed Cost	F	0.012	0.001

- Same for the **economic** depreciation process

$$
\begin{aligned}
\delta\left(\mu_{j,t}, \theta_{t+1}\right) &= \delta_0 + \theta_{t+1}\left(\delta_1 + f\left(u_{j,t}\right)\right) \\
f(\mu) &= \delta_u \frac{u^{1+\lambda} - 1}{1+\lambda} \\
\ln \theta_t &= \mu_\theta + \rho_\theta\left(\ln \theta_{t-1} - \mu_\theta\right) + \sigma_\theta \varepsilon_t^\theta
\end{aligned}
$$

  - several assumptions: $\mu_\theta = 0$; $\delta_1 = \bar{\delta} - \delta_0$; $\bar{\delta} = 10\%$
  - again, which set of data moments are most informative?

Comment #3: Key Identification Moments

Table 3: Aggregate Moments Used in SMM Estimation of the Model

Moments	Data	Mean	2.5^{th}	25^{th}	75^{th}	97.5^{th}
$E[\Delta y]$	0.019	0.022	0.003	0.014	0.027	0.039
$\sigma(\Delta y)$	0.029	0.030	0.027	0.030	0.034	0.037
$\sigma(\Delta c)/\sigma(\Delta y)$	0.711	0.969	0.925	0.953	0.984	1.013
$\sigma(\Delta i)/\sigma(\Delta y)$	2.627	1.317	1.309	1.649	2.059	2.377
$\rho(\Delta c, \Delta i)$	0.745	0.796	0.665	0.710	0.767	0.819
$E[R^{MKT} - R^f]$	0.073	0.052	-0.017	0.015	0.068	0.091
$\sigma(R^{MKT} - R^f)$	0.174	0.148	0.097	0.123	0.156	0.191
$E[R^f]$	0.013	0.012	0.002	0.009	0.017	0.024
$\sigma(R^f)$	0.022	0.013	0.009	0.010	0.012	0.015
$E[\delta]$	0.100	0.113	0.112	0.126	0.145	0.176
$\sigma(u)$	0.041	0.050	0.033	0.038	0.064	0.074

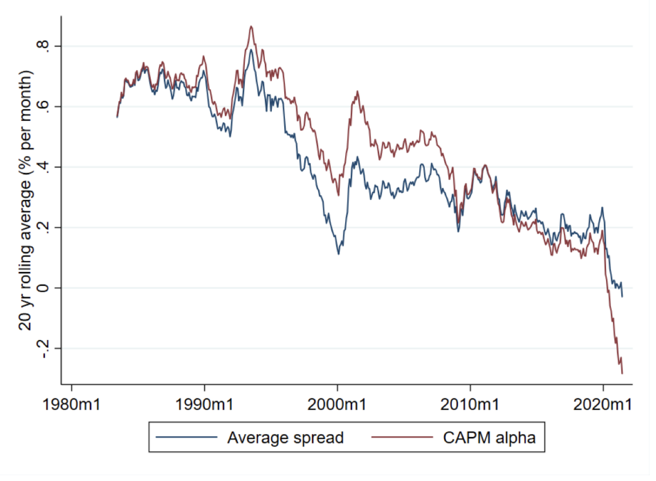
Comment #3: Key Identification Moments

Moments	Data	Mean	2.5^{th}	25^{th}	75^{th}	97.5^{th}
I/K of MB 1	0.069	0.058	0.053	0.055	0.059	0.066
I/K of MB 2	0.090	0.089	0.074	0.082	0.090	0.097
I/K of MB 3	0.108	0.126	0.100	0.106	0.127	0.139
I/K of MB 4	0.131	0.169	0.150	0.154	0.169	0.183
I/K of MB 5	0.157	0.200	0.195	0.198	0.202	0.206
I/K of GPA 1	0.081	0.094	0.068	0.084	0.095	0.130
I/K of GPA 2	0.091	0.178	0.104	0.125	0.175	0.183
I/K of GPA 3	0.101	0.093	0.081	0.088	0.094	0.103
I/K of GPA 4	0.110	0.149	0.141	0.146	0.150	0.156
I/K of GPA 5	0.124	0.110	0.101	0.105	0.111	0.121
$E[R^e]$ of MB 1	0.075	0.041	-0.031	0.003	0.044	0.084
$E[R^e]$ of MB 2	0.073	0.047	-0.023	0.009	0.049	0.089
$E[R^e]$ of MB 3	0.080	0.052	-0.017	0.016	0.054	0.091
$E[R^e]$ of MB 4	0.083	0.057	-0.013	0.020	0.059	0.098
$E[R^e]$ of MB 5	0.111	0.058	-0.014	0.020	0.061	0.101
$E[R^{Value}]$	0.037	0.016	0.012	0.015	0.017	0.022
$E[R^e]$ of GP/A 1	0.045	0.043	-0.023	0.008	0.045	0.079
$E[R^e]$ of GP/A 2	0.054	0.046	-0.022	0.010	0.048	0.084
$E[R^e]$ of GP/A 3	0.075	0.055	-0.015	0.017	0.057	0.096
$E[R^e]$ of GP/A 4	0.067	0.058	-0.018	0.018	0.061	0.102
$E[R^e]$ of GP/A 5	0.090	0.066	-0.018	0.023	0.070	0.115
$E[R^{GP/A}]$	0.046	0.024	-0.013	0.010	0.030	0.048
$corr(R^{Value}, R^{GP/A})$	-0.523	-0.637	-0.891	-0.792	-0.479	0.162
5-0 CF difference ratio (MB)	0.470	0.377	0.255	0.299	0.473	0.803
5-0 CF difference ratio (GP/A)	0.125	0.081	0.058	0.072	0.089	0.108

Comment #4: Disappearing Value Premium

- A decline in the value premium (e.g., Fama and French 2021): from 5.7% in 1963-2001 to -0.4% in 2001-2021

Figure 1: Rolling 20-year average value premium



This figure plots 20-year rolling average return and CAPM alpha of top book-to-market quintile (value stocks) minus bottom book-to market-quintile (growth stocks). The sample period is from 1963m7 to 2021m6.

Comment #4: Disappearing Value Premium

- How to think about this long-term trend under this two-factor productivity story?
- A related paper: Ma and Yan (2015) "The Value and Profitability Premiums"

  *"**We present a unified risk-based explanation for the value premium and the profitability premium as well as for their inverse relationship in the time series.** Our simple equity valuation model takes into account financial leverage and time-varying credit conditions explicitly and allows for potential shareholder recovery upon the resolution of financial distress. **The model predicts that the value premium declines and the profitability premium is prominent when credit spreads increase under tightening credit conditions**, while the opposite happens when credit spreads decrease, resulting in their inverse relationship in the time series. The model further predicts that the sensitivity of the value and profitability premiums to credit conditions depends on the degree of potential shareholder recovery. Our empirical evidence strongly supports these predictions."*

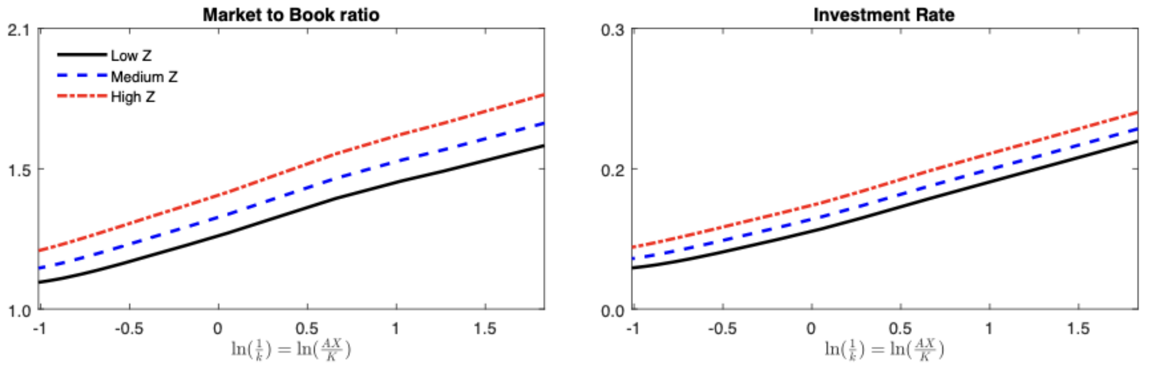
COMMENT #5: THE MODEL-IMPLIED DEPRECIATION SHOCKS

- Depreciation shocks are crucial for explaining the profitability premium
- Need external validation
- Technological Obsolescence by Ma (2025)

> *"This paper proposes a new measure of technological obsolescence using detailed patent data. The measure contains incremental information about firm innovation relative to measures focusing on new innovation. Using this measure, we present two sets of results. First, firms' technological obsolescence foreshadows substantially lower growth, productivity, and reallocation of capital. This finding applies mainly for obsolescence of core innovation and embodied innovation, and it is stronger in competitive product markets. Second, in stock markets, high-obsolescence firms under-perform low-obsolescence firms by 7 percent annually. Using analyst forecast data, we show this is due to a systematic overestimation of future profits of obsolescent firms."*

- $\delta\left(\mu_{j,t}, \theta_{t+1}\right)$: economic depreciation v.s. accounting depreciation

Comment #6: Unfair Comparison



- Z v.s. $\ln(\frac{1}{k}) = \ln(\frac{AX}{K})$
- for $\ln(\frac{1}{k})$, 90% of firms are within the range of (-0.84, 1.69)

Comment #7: Counterfactuals

- The model is computationally intensive and complex with many elements: capital adjustment costs, variable capital utilization, and depreciation shocks, ...
- Many key implications are quantitative statements
- Structural shock decomposition will be super useful for understanding both the strengths and limitations of this new framework

Summary

- **A great and well-written paper!**
- Important question, solid technical skills, novel framework, ...
- I learned a lot from reading it
- **Good luck with the publication!**