Manager Uncertainty and the Cross-Section of Stock Returns

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Research Question:
Uncertainty Measures and Asset Pricing

- Uncertainty draws a lot of attention.
  - e.g., economic policy uncertainty (Baker, Bloom, and Davis, 2016 QJE), macro uncertainty index (Jurado, Ludvigson, and Ng, 2015 AER)
- Existing firm-level uncertainty measures are from investors' perspective.
  - e.g., option-implied volatility (Dew-Becker, Giglio, and Kelly, 2021 JFE)
- Whether managers' disclosed uncertainty has incremental pricing power to cross-sectional stock returns?

Findings Take-away

- Manager uncertainty (MU)
  - The degree of managers' uncertain beliefs about future states.
  - The count of the word "uncertainty" over the sum of the count of the word "uncertainty" and the count of the word "risk" in filings and conference calls.

- Main findings
  - Negative explanatory power to cross-sectional stock returns.
    - Consistent with real options theory
    - High MU is associated with precautionary behaviors
    - Investors favor firms with high MU
  - Incremental pricing power beyond existing uncertainty measures
  - Cannot be spanned by existing risk factor models.
  - Application on specific uncertainties: COVID-19 MU

Motivation: Top words in uncertainty sentences

- When managers use the word "uncertainty", they are more likely to describe macroeconomic or rare events, such as political events, regulations, and terrorism.

Motivation: representative uncertainty sentences

- " We might see these adverse effects continue as a result of the uncertainty of these ongoing inquiries and proceedings or additional inquiries and proceedings by federal or state regulatory agencies…"
- " The potential for future terrorist attacks, the national and international responses to terrorist attacks, and other acts of war or hostility have created many economic and political uncertainties which could adversely affect our business and results of operations in ways that cannot presently be predicted."
- " Due to the complexities and extensive history of the company's environmental and bodily injury matters the amounts and timing of future expenditure is uncertain."
- " The full extent of the impact of the COVID-19 pandemic on the Apple's operational and financial performance is currently uncertain and will depend on many factors outside the Company's control."

Motivation: top words in risk sentences

- When firms use the word "risk", they are more likely to describe firm-specific issues, such as operations, leverage, competition…

Motivation:
top words in both uncertainty and risk sentences

Motivation:
vocabulary choice to talk about COIVD-19

- "Given the COVID-19 uncertainty, we're using a range. We've never done a range before."
- "Right now, for us, even on contract renewals and signings, this week in face of coronavirus uncertainty, leading-edge revenue per day net of pass-throughs in the 20-ish range on renewals and in the high teens, where competition is greatest."
- "As discussed, booking patterns continue to reflect U.S.-China trade and tariff dynamics, country-specific macro uncertainty, segment-specific demand visibility challenges and, more recently, the coronavirus uncertainty."
- "And finally, all our field support associates who can work from home are doing so in order to reduce the coronavirus risk in our field support offices."
- "First, as noted on previous calls and like other companies, we've experienced both direct and indirect commercial pressures related to tariffs and more recently, increased import risk given the potential for supply chain disruption due to coronavirus risk."

Motivation: Uncertainty versus Risk

	Uncertainty	Risk	Source
Probability distribution	Unknown	Known	Knight (1921)
Outcome	Unknown	Unknown	Knight (1921)
Knowledge	No	Yes	Epstein and Schneider (2010)
Example	coronavirus	seasonal flu	

- Decision-making process: (1) belief formation; (2) valuation.
- The magnitude of uncertainty is in the belief formation stage while the magnitude of risk is in the valuation stage. (Brenner and Izhakian, 2018 JFE)

Manager Uncertainty: Intuition

- Vocabulary choice reflects managers' subjective beliefs about future states.
- The choice between "uncertainty" and "risk" is conditional on managers' information of the probability distribution of future states.
- **Manager Uncertainty (MU)**

$$MU = \frac{N_{uncertain}}{N_{uncertain}+N_{risk}}$$

  - $N_{uncertain}$ is the clean number of the word "uncertainty"
  - N_{risk} is the clean number of the word "risk"

- It captures managers' degree of uncertainty on probability distribution of future outcomes/states.
- E.g., what is the percentage of cases that managers think:
  - the future states are unpredictable/unmeasurable
  - the impact of future exposures is out-of-control

MU: A Textual-Based Measure

- **Manager Uncertainty (MU)**

$$MU = \frac{N_{uncertain}}{N_{uncertain}+N_{risk}} = \frac{N^{*}_{uncertain}-N_{risk\_uncertainty}-N_{uncertain\_tax}}{N^{*}_{uncertain}-2\times N_{risk\_uncertainty}-N_{uncertain\_tax}+N^{*}_{risk}-N_{risk\_factor}}$$

  - $N_{uncertain}$ is the clean number of the word "uncertainty"
  - N_{risk} is the clean number of the word "risk"

- Baseline MU: 10-K/10-Q filings
  - Sample period: 1993-2018 Coverage: 9,840 firms (by cik) per year

- Alternative MU: 10-K/10-Q filings and conference call transcripts

$$MU\_A = \frac{1}{2}MU + \frac{1}{2}MU^{cc}$$

  - Sample period: 2007-2018 Coverage: 1,863 firms per year

- Firm-calendar year level, firm-fiscal year level, firm-month level.
- Range [0,1]

Comparison with Existing Measures

- MU conveys managers' perception of exposure types (unknown versus known distribution) of their business.

- "$N_{uncertain}+N_{risk}$" reflects managers' trade-off and is a better denominator.

- Loughran and Macdonald (2011 JF): $\frac{N_{uncertain}+N_{risk}+\cdots}{N_{doc}}$
- Hassan et al. (2020 QJE): $\frac{N_{uncertain}+N_{risk}}{N_{doc}}$
- Baker et al. (2016 QJE) and Handley and Li (2020 NBER): $\frac{N_{uncertain}}{N_{doc}}$
- Jiang et al. (2019 JFE): $\frac{N_{positive}-N_{negative}}{N_{doc}}$

Alternative ML-Based Measure (ML_MU)

- Word Embedding (Word2Vec)

- $$\text{ML\_MU} = \frac{\text{N}_{\text{uncertain}} + \sum_{k=1}^{K1}(w_u - w_r)N_k}{\text{N}_{\text{uncertain}} + \text{N}_{\text{risk}} + \sum_{k=1}^{K2}|w_u - w_r|N_k}$$

  Where w_u and w_r are cosine similarities with uncertainty and risk.

  N_k is the count of word of topic k. K is total number of topics.

  #words are adjusted by TF-IDF weighting matrix

- Improvement:
  - Capture exposures without mentioning uncertainty and risk.
  - Augmented heterogenous uncertain beliefs with overall beliefs.

Word2vec: properties

- The word2vec is a neural network model to learn the meaning of a specific word through textual documents and to predict its neighboring words.

- I train the word2vec model by using Standford's Global Vectors for Word Representation (GloVe) algorithm.

- **properties of the word vectors**

$$vector(\text{“}\ paris\ \text{”}) - vector(\text{“}\ france\ \text{”}) + vector(\text{“}\ germany\ \text{”})$$

the resulting vector will be close to the vector for “berlin”.

```
# berlin     paris    munich    leipzig   germany
# 0.8015347 0.7623165 0.7013252 0.6616945 0.6540700
```

Motivation: Top words that have large cosine similarity differences between uncertainty and risk

Hypothesis: Negative Pricing

- **H1: high-MU firms have lower expected return than low-MU firms.**

- Real Options theory models firms' investment dynamic under uncertainty.
  - Firms' investment decisions are analogous to financial call options.

- To capitalize real options value, high-MU firms would wait-and-see and are more likely to be precautionary and conservative in investments.

- High-MU firms make more contingent plans and have high flexibility and thus lower adjustment costs in bad times.

- Investors favor high-MU firms and are willing to pay higher prices to hold these stocks thus accept lower premium.

Data

- 10-K/10-Q filings: DirectEdgar
- Earnings call transcripts: S&P Capital IQ
- Return related: CRSP, CCM
- Firm characteristics: Compustat
- Option related: OptionMetric, WRDS Option Suite
- Textual related: SEC Analytic Suite
- Analysts' forecast: I/B/E/S
- Factors: authors' websites

- 21 firm-year level; 17 firm-month level; 29 factors; 15 beta loadings.

Manager Uncertainty and Firms' Real Actions

	(1) Investment Growth	(2) Employment Growth	(3) Working Capital Growth	(4) Cash Holding Growth
MU	-0.075***	-0.032**	0.122**	0.299*
	(-4.25)	(-2.32)	(2.19)	(1.79)
ln(total assets)	-0.092***	-0.094***	-0.051**	-1.174***
	(-16.56)	(-24.46)	(-2.51)	(-25.16)
Constant	0.706***	-0.419***	0.297***	6.432***
	(24.18)	(-18.90)	(3.25)	(22.17)
Firm-FE	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes
Obs.	108,767	111,282	107,407	118,515
Adj. R^2	0.192	0.136	0.101	0.076

- Consistent with real options theory, high uncertainty leads to less investment and hiring but more working capital and cash holding.
- Similar finding by Bloom et al. (2007 RES; 2018 Econometrica)

Fama-MacBeth Regression
Control textual-based factors

Dependent Variable: Monthly Excess Returns

	(1)	(2)	(3)	(4)	(5)	(6)
MU	-1.274***	-1.663***	-1.421**	-1.155***	-1.107***	-0.782***
	(-3.47)	(-3.56)	(-2.23)	(-3.42)	(-3.03)	(-5.35)
$N_{uncertain}$	-0.010					
	(-1.39)					
N_{risk}	0.000					
	(0.06)					
$\frac{N_{uncertain}}{N_{doc}}$		1.815		-0.548	-0.390	
		(0.42)		(-0.20)	(-0.14)	
$\frac{N_{risk}}{N_{doc}}$		-0.476		-0.324	-0.404	
		(-0.57)		(-0.38)	(-0.45)	
Negative Sentiment			-0.295**	-0.325*		
			(-2.48)	(-1.86)		
Positive Sentiment			1.063***	1.020***		
			(3.25)	(4.76)		
Uncertain Sentiment			0.064	0.143	0.265	
			(0.35)	(0.84)	(1.26)	
Management Tone					0.382***	
					(3.49)	
Smog Readability				-0.064*	-0.046	
				(-1.67)	(-1.29)	
MU#Dummy2005						-0.026***
						(-8.86)
Dummy2005						-0.313***
						(-5.61)
Obs.	3801	3801	3752	3599	3599	3801
Adj. R^2	0.009	0.039	0.0509	0.0569	0.053	0.005

Fama-MacBeth Regression

Control existing uncertainty measures and firm characteristics

Dependent Variable: Monthly Excess Returns

	(1)	(2)	(3)	(4)	(5)
MU	-0.931***	-1.472***	-0.646**	-1.931***	-1.971***
	(-3.08)	(-4.54)	(-2.35)	(-2.85)	(-4.54)
Implied Volatility	-2.814***		-6.572***		
	(-3.36)		(-8.21)		
Realized Volatility	-0.202		-0.225		
	(-0.27)		(-0.35)		
Volatility of Volatility	71.551***		62.189***		
	(5.07)		(4.01)		
Idiosyncratic Volatility	-6.536***		-2.322		
	(-3.32)		(-1.32)		
Analysts' Dispersion	-0.055*		-0.084**		
	(-1.87)		(-2.00)		
Market Beta		-0.077	0.279**		-0.169
		(-0.55)	(2.15)		(-1.28)
Firm Size		-0.247***	-0.631***		-0.353***
		(-5.22)	(-10.21)		(-6.18)
Book-to-Market		-1.018***	-1.056***		-1.011***
		(-7.35)	(-6.55)		(-7.26)
Investment		-0.361***	-0.343***		-0.366***
		(-6.52)	(-4.05)		(-6.64)
Profitability		0.128	-0.939***		0.133
		(1.45)	(-3.88)		(1.50)
Momentum		-0.005***	-0.006***		-0.004***
		(-3.09)	(-2.67)		(-2.87)
Reversal		-0.008**	-0.017***		-0.008**
		(-2.48)	(-3.25)		(-2.43)
Liquidity		-0.009***	-1.482***		-0.009***
		(-6.17)	(-5.08)		(-6.17)
Skewness		-0.051	0.045		-0.042
		(-0.30)	(0.13)		(-0.24)
Kurtosis		-0.140	-0.116		-0.144
		(-1.28)	(-0.84)		(-1.29)
MU#Dummy_option				1.012**	0.636*
				(2.38)	(1.82)
Dummy_option				0.129	0.593***
				(0.97)	(4.31)
Constant	1.819***	1.991***	6.768***	0.879***	2.422***
	(4.29)	(5.56)	(8.89)	(3.11)	(6.08)
Obs.	1385	2734	1084	3801	2734
Adj. R^2	0.085	0.070	0.158	0.009	0.073

Predictive Regression over Long Horizons

- Monthly MU:

  For month t, I compute the MU from month t-11 to t.

- The predictive power lasts 9 months.

Dependent Variable: Monthly Excess Returns

(1)	(2) Coef	(3) T-statistics	(4) Obs.	(5) Adj. R^2
T	-0.711**	(-2.22)	2,687	0.058
T+1	-0.673**	(-2.08)	2,682	0.057
T+2	-0.680**	(-2.12)	2,679	0.059
T+3	-0.643**	(-2.01)	2,676	0.058
T+4	-0.634**	(-1.98)	2,673	0.059
T+5	-0.663**	(-2.11)	2,670	0.059
T+6	-0.640**	(-2.03)	2,667	0.059
T+7	-0.611**	(-1.96)	2,662	0.060
T+8	-0.625**	(-2.02)	2,660	0.059
T+9	-0.653**	(-2.09)	2,658	0.059
T+10	-0.578*	(-1.86)	2,655	0.059
T+11	-0.569*	(-1.82)	2,652	0.059
T+12	-0.587*	(-1.88)	2,649	0.059
T+13	-0.570*	(-1.82)	2,648	0.059
T+14	-0.638**	(-2.03)	2,646	0.060
T+15	-0.609*	(-1.94)	2,642	0.059
T+16	-0.553*	(-1.73)	2,641	0.060
T+17	-0.534*	(-1.66)	2,636	0.060
T+18	-0.523	(-1.62)	2,635	0.060

Robust to Alternative Measure of MU

Dependent Variable: Excess Returns

	(1)	(2)	(3)	(4)	(5)	(6)
MU_A	-0.651**	-0.627***	-0.673***	-0.696***	-0.600**	-0.608**
	(-2.26)	(-2.67)	(-2.84)	(-2.90)	(-2.10)	(-2.15)
$LM_{negative}$			-0.193			
			(-0.92)			
$LM_{positive}$			0.595			
			(0.93)			
$LM_{uncertain}$			-0.529*	-0.419		-0.530
			(-1.88)	(-1.37)		(-1.53)
Tone				0.176		0.024
				(0.87)		(0.11)
Smog				-0.083		-0.081
				(-1.35)		(-1.29)
VOLI					-7.253***	-7.063***
					(-5.03)	(-5.07)
VOLR					0.297	0.376
					(0.20)	(0.25)
VOV					100.754***	101.397***
					(4.06)	(4.10)
IDVOL					1.465	0.622
					(0.61)	(0.26)
DISP					-0.071	-0.061
					(-1.45)	(-1.23)
Constant	1.078**	0.911*	1.209**	2.646**	3.988***	5.624***
	(2.30)	(1.94)	(2.59)	(2.44)	(5.71)	(4.13)
Control	No	Yes	Yes	Yes	Yes	Yes
Obs.	1328	1200	1100	1099	679	679
Adj. R^2	0.003	0.085	0.090	0.087	0.158	0.160

Control: firm size, book-to-market, investment, profitability, momentum, etc.

Robust to machine learning based ML

Dependent Variable: Excess Returns

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	MU_ML				MU_ML with TF-IDF			
MU_A	-1.126**	-1.204***	-1.560***	-1.542***	-1.613***	-1.599***	-1.996***	-1.907***
	(-2.61)	(-2.62)	(-2.80)	(-2.80)	(-2.81)	(-2.64)	(-2.90)	(-2.80)
$LM_{negative}$	-0.620***				-0.615***			
	(-3.09)				(-3.07)			
$LM_{positive}$	1.107***				1.034***			
	(5.69)				(5.84)			
$LM_{uncertain}$	0.070	0.049		-0.032	0.056	0.409		-0.293
	(0.39)	(0.25)		(-0.15)	(0.32)	(0.21)		(-0.14)
Tone		0.801***		0.639***		0.802***		0.634**
		(4.99)		(3.53)		(5.04)		(3.51)
Smog		-0.113*		-0.097		-0.108*		-0.095
		(-1.97)		(-1.52)		(-1.88)		(-1.47)
VOLI			-6.153***	-5.649***			-6.122***	-5.614***
			(-5.37)	(-5.06)			(-5.31)	(-5.01)
VOLR			-1.504	-1.471			-1.503	-1.472
			(-1.41)	(-1.41)			(-1.41)	(-1.41)
VOV			99.213***	99.617***			99.256***	99.686***
			(5.00)	(5.02)			(4.99)	(5.01)
IDVOL			1.858	1.572			1.856	1.567
			(1.06)	(0.88)			(1.06)	(0.87)
DISP			-0.020	-0.015			-0.020	-0.015
			(-0.67)	(-0.51)			(-0.67)	(-0.52)
Constant	0.757	3.383***	5.377***	6.907***	1.050*	3.563***	5.631***	7.075***
	(1.44)	(3.23)	(7.09)	(5.04)	(1.83)	(3.27)	(7.03)	(5.00)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1431	1406	860	860	1431	1406	860	860
Adj. R^2	0.087	0.089	0.153	0.160	0.080	0.087	0.153	0.159

Application: COVID-19 Uncertainty

Schrager, A. 2020. Risk, Uncertainty and Coronavirus. *Wall Street Journal*, March 23, 2020.

COVID-19 MU

- How to measure?

  - First, I create a word list for COVID-19 by using word embedding in conference calls;
  - Second, I tag COVID-19-related paragraphs using the word list;
  - Third, I compute MU in tagged paragraphs.

  - Reference:
  - Li Kai, Xing Liu, Feng Mai, and Tengfei Zhang. 2021. The Role of Corporate Culture in Bad Times: Evidence from the COVID-19 Pandemic. *Journal of Financial and Quantitative Analysis* forthcoming

COVID-19 Uncertainty and Stock Returns

Dependent variable: excess returns in the first quarter of 2020.

Control variables: beta loadings of Fama and French (2018) six-factor model.

	(1)	(2)	(3)	(4)	(5)	(6)
Covid_MU	-4.928***	-4.921***	-4.610***	-3.772***	-4.198***	-2.908**
	(-3.57)	(-3.56)	(-3.34)	(-2.76)	(-3.07)	(-2.16)
β^{MKT}		0.035	0.070	-0.355	0.424	-0.025
		(0.12)	(0.19)	(-0.77)	(1.22)	(-0.06)
β^{SMB}			-0.006	-0.284	-0.019	-0.423
			(-0.02)	(-1.09)	(-0.08)	(-1.57)
β^{HML}			-1.245***	-3.264***	-2.899***	-6.759***
			(-3.88)	(-7.52)	(-6.26)	(-11.17)
β^{UMD}				5.133***		7.207***
				(7.16)		(9.04)
β^{RMW}					-0.627***	-0.686***
					(-2.78)	(-3.23)
β^{CMA}					-1.725***	-2.876***
					(-5.41)	(-7.83)
Constant	-33.976***	-34.017***	-34.250***	-33.526***	-34.902***	-34.107***
	(-34.05)	(-33.23)	(-31.90)	(-30.74)	(-32.95)	(-32.40)
Obs.	1980	1980	1980	1980	1980	1980
R^2	0.007	0.007	0.017	0.055	0.038	0.105

Portfolio Analysis—Sorting by MU

Manager Uncertainty Factor: long low-MU firms and short high-MU firms

Quintiles	MU mean	Return
1 (low)	0.023	1.100***
		(4.52)
2	0.083	1.090***
		(3.47)
3	0.134	0.953***
		(3.00)
4	0.218	0.813***
		(2.36)
5 (high)	0.379	0.617*
		(1.76)
low (1)-high(5)		0.482***
		(2.74)

Manager Uncertainty Factor (MUF):
Relation with existing aggregate uncertainty measures

Dependent Variable: MUF

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(9)
Macro Uncertainty Index 1-month-ahead	-2.003							-7.606***
	(-0.92)							(-3.43)
Macro Uncertainty Index 3-month-ahead		-1.928						
		(-0.89)						
Macro Uncertainty Index 12-month-ahead			-3.575					
			(-0.94)					
Economic Policy Uncertainty				0.008*				0.000
				(1.85)				(0.09)
Equity Market Volatility					0.094***			0.102**
					(4.55)			(2.34)
Volatility Index (VIX)						0.049**		0.031
						(2.06)		(0.70)
Variance Risk Premium							-0.015*	-0.017**
							(-1.75)	(-2.30)
Constant	1.776	1.984	3.722	-0.371	-1.444***	-0.461	0.712***	2.914**
	(1.30)	(1.22)	(1.10)	(-0.80)	(-3.60)	(-1.12)	(3.62)	(2.17)
Obs.	312	312	312	312	312	312	312	312
Adj. R^2	0.004	0.003	0.004	0.012	0.060	0.015	0.011	0.100

Manager Uncertainty Factor (MUF): Spanning tests by existing factor models

Dependent Variable: MUF

	(1)	(2) CAPM	(3) FF3	(4) FF5	(5) FF6	(6) HXZ4	(7) DMRS5	(8) SY4	(9) DHS3	(10) LASSO
MKT_RF		-0.348***	-0.256***	-0.193***	-0.155***	-0.099***	0.105	-0.114**	-0.093**	-0.106***
		(-8.36)	(-7.87)	(-5.61)	(-4.90)	(-2.63)	(1.15)	(-2.48)	(-2.42)	(-3.35)
SMB			-0.321***	-0.177***	-0.198***	-0.167***	-0.031	-0.218***		-0.159***
			(-7.02)	(-3.54)	(-4.39)	(-4.20)	(-0.30)	(-3.88)		(-3.45)
HML			0.406***	0.336***	0.379***		0.655***			0.266***
			(8.88)	(6.65)	(7.83)		(3.77)			(4.76)
RMW				0.352***	0.338***	0.543***	0.566***			0.332***
				(4.64)	(4.84)	(8.15)	(3.11)			(4.72)
CMA				-0.341**	-0.310**	0.377***	-0.512***			-0.417***
				(-2.29)	(-2.33)	(5.84)	(-2.88)			(-3.10)
UMD					0.112***					0.102***
					(3.77)					(3.57)
MGMT								0.512***		0.198***
								(8.86)		(2.82)
PERF								0.085**		
								(2.03)		
PEAD									0.101	
									(1.52)	
FIN									0.459***	
									(12.88)	
Intercept	0.482***	0.701***	0.611***	0.523***	0.438***	0.272**	0.313*	0.275*	0.247*	0.324***
	(2.81)	(4.47)	(4.97)	(4.55)	(3.90)	(2.10)	(1.96)	(1.74)	(1.71)	(2.73)
Obs.	312	312	312	312	312	312	312	288	312	288
R^2	0.000	0.235	0.518	0.608	0.635	0.576	0.174	0.496	0.544	0.666

Alternative Story: MU is Strategic Reporting?

- Honesty: attribute management failure to uncertainty.
- The correlation between MU and profitability is not strong.
- Strong correlation between the MUF and management quality (MGMT) factor, but 67% of the MUF cannot be fully spanned by it.
- Still hold when controlling for beta loadings of MGMT and RMW, profitability, and corporate governance.

Robust Checks

- Robust to alternative measures of MU
  - Synonym-based measure; machine learning based measure
  - Drop extreme values (0 and 1)
  - Search only in Item 1A and Item 7A of 10-K filings.
  - Use data after 2005 only

- Robust to return adjustments
  - Winsorize returns and truncate returns
  - Pricing at the portfolio level

- Robust to methodologies
  - Fama-MacBeth regression
  - Panel regressions with fixed effects (firm, industry, year)
  - Giglio and Xiu (2021 JPE)'s 3-step method to resolve omitted variables

Conclusions

- This paper introduces a novel measure of the degree of managers' uncertain beliefs about future states: manager uncertainty (MU).

- MU has negative pricing power to cross-sectional stock returns.
  - MU reveals real options value of managers' uncertain beliefs.
  - MU has pricing power beyond existing uncertainty measures.
  - A long-short portfolio cannot be spanned by factor models.

- Different with existing literature treats risk and uncertainty interchangeably, this paper evidences that the relative choice of the two words has economic implications.

Thank You

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