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Foreign Economic Policy Uncertainty and US Equity Returns

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Global Economic Uncertainty and the U.S. Equity Returns

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Some background information

- Standard asset pricing theory: "market" volatility contains all the information needed for risk-return tradeoff analysis.
  - Historical realized vol? Option-implied vol? VRP?
  - Risk, uncertainty, Knightian uncertainty?
  - Are there other aspects of risk not captured by these measures?
- Baker, Bloom, and Davis (2016) introduce a news-based measure for uncertainty about economic policy decisions (EPU).
- A series of studies (Pastor and Veronesi, 2012, 2013, Brogaard and Detzel, 2015, among many others) show that U.S. EPU has predictive power for aggregate U.S. equity returns and is priced in the cross section of returns.

Some background information

- In line with the literature on the impact of U.S. (monetary, fiscal, political) policies on global financial markets (e.g., Miranda-Agrippino and Rey, 2022), and drawing on earlier studies such as Boutchkova et al. (2012), Brogaard et al. (2020) argue that the direction of political information affecting asset prices is from the U.S. to the rest of the world.
- But could it be that the reverse is also true? That is, in an interconnected world, foreign economic and political uncertainty also affects the pricing U.S. assets?

Why are we interested?

- With the rise of globalization, do we expect foreign economic policy uncertainty (EPU) to affect U.S. businesses and their equity returns. Examples: European debt crisis, Brexit, U.S. and China trade issues, ...
- Analysts and market practitioners mention foreign EPU as a factor affecting U.S. returns. Academic research has not considered it.
- Does foreign EPU have predictive power for U.S. returns? If yes,
  - What is the prediction horizon?
  - At aggregate level, which portfolios are sensitive to global EPU?
  - What are the channels of transmission?

Why does it matter?

- Interest in the scope and the extent of foreign policy uncertainty's impact on U.S. returns.
- Characteristics of companies that demonstrate sensitivity to foreign policy uncertainty.
- We are interested in the nature of this sensitivity:
  - Time-series aspects:
    - Size, sign, and significance of predictability
    - Prediction horizons
    - Transmission channels
    - Potential spillovers to the "real" side.

What do we find?

- Time-series:
  - At the aggregate level, global EPU predictability is more concentrated in larger companies (large caps).
  - However, market-wide and mid-cap indexes are also predictable.
  - Predictive window is in excess of 6 months, and concentrated in 9 and 12-months ahead.
  - In addition to size, the following factors identify sensitivity to global EPU: investment, operating profitability, idiosyncratic variance, CapEx, and foreign sales.
    - A digression into industry portfolios reveals interesting and unexpected results.
  - Work on transmission channels and spillovers to macroeconomic variable in progress.

The existing literature

- Existing literature on financial risk-return tradeoff: Ghysels et al. (2005), Bandi and Perron (2008), Bollerslev, Tauchen and Zhou (2009), ...
- Economic uncertainty measures: Baker, Bloom and Davis (2016), Jurado, Ludvigson, and Ng (2015), Scotti (2016), Caldara and Iacoviello (2022), ...
- Applications of EPU: credit spreads (Kaviani et al., 2020); corporate investments (Gulen and Ion 2015), mergers and acquisitions (Bonaime, Gulen, Ion 2018); financing costs measured through loan premiums (Kim, 2019); or multinationals' decisions to redirect investments (Sarkar, 2020).
- Key papers:
  - Pastor and Veronesi (2013, JFE)
  - Brogaard and Detzel (2015, MS)
  - Bali, Brown, and Tang (2017, JFE)
  - Borgaard, Dai, Ngo, Zhang (2020, RFS)

Data

Sample period is 01/1997-06/2021. Data for time-series analysis:

- Returns: S&P500, CRSP, NASDAQ, Russell 2000.
- Risk-free rate: 1-month U.S. Treasury Bill rate.
- Fama and French 49 industry portfolio returns.

Uncertainty measures:

- Baker, Bloom and Davis (2016) U.S. and global EPU.
- Problem: Global EPU loads heavily on U.S. information. We orthogonalize global and U.S. EPU:

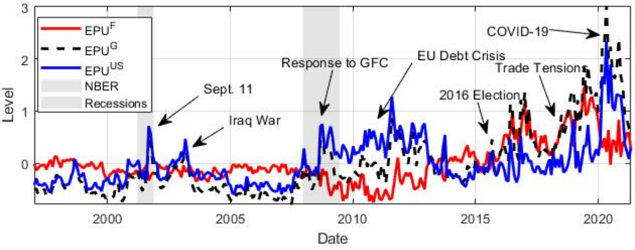
$$EPU_t^g = \kappa_0 + \kappa_1 EPU_t^{US} + \nu_t.$$

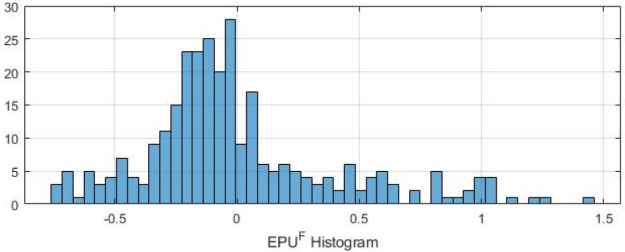
- $\hat{\nu}_t = EPU_t^F$

Cross-sectional data and factors:

- Fama and French factors
- Compustat
- Other usual suspects

The nature of foreign EPU





The nature of foreign EPU

Table 1: "Validation" of EPU Measures

EPU^F	VIX	U.S. Spread	U.S. Def.	log(P/D) U.S.	CFNAI	German Spread	BDI	ΔIP Europe
Contemp.	-0.13*	-0.16**	-0.21**	-0.05	0.01	-0.26**	-0.10**	-0.0002
	(-2.89)	(-3.67)	(-3.91)	(-0.25)	(0.42)	(-4.44)	(-3.45)	(-0.02)
Adj. R^2	7.22	18.70	4.48	-0.27	0.24	24.34	6.41	0.34
lag =1	-0.12*	-016**	-0.22**	-0.07	0.02	-0.26**	-0.11**	0.00
	(-2.64)	(-3.59)	(-4.23)	(-0.31)	(0.77)	(-4.31)	(-3.53)	(0.51)
Adj. R^2	6.01	18.17	4.80	-0.22	-0.02	23.37	6.90	-0.30
lag = 3	-0.14**	-0.16**	-0.23**	-0.10	0.03	-0.25**	-0.11**	0.01
	(-3.03)	(-3.53)	(-4.65)	(-0.39)	(1.29)	(-4.17)	(-3.45)	(0.82)
Adj. R^2	8.07	17.67	5.34	-0.11	0.64	21.30	7.54	-0.15
lag = 6	-0.15**	-0.15**	-0.22**	-0.14	0.02	-0.22**	-0.13**	0.01
	(-3.28)	(-3.35)	(-3.97)	(-0.54)	(0.97)	(-3.72)	(-3.65)	(0.83)
Adj. R^2	9.05	15.30	5.16	0.14	0.32	17.37	9.82	-0.12
lag = 9	-0.17**	-0.13**	-0.23**	-0.15	0.02	-0.20**	-0.15**	0.01
	(-3.64)	(-3.04)	(-3.93)	(-0.60)	(0.83)	(-3.29)	(-4.24)	(1.10)
Adj. R^2	11.16	12.05	5.27	0.22	0.26	13.39	12.99	0.08

The nature of foreign EPU

Table 2: “Validation” of EPU Measures

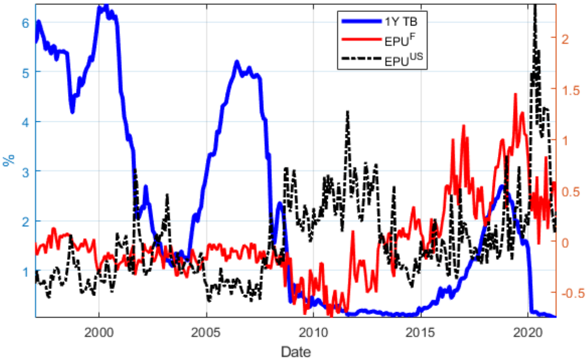
EPU^{US}	VIX	U.S. Spread	U.S. Def.	log(P/D) U.S.	CFNAI	German Spread	BDI	ΔIP Europe
Contemp.	0.52**	0.19*	0.83**	-1.90**	-0.10	-0.01	-0.20*	-0.02
	(4.42)	(1.91)	(4.06)	(-5.73)	(-1.08)	(-0.08)	(-2.44)	(-0.30)
Adj. R^2	17.60	3.88	11.84	14.18	1.24	-0.33	3.68	0.16
lag =1	0.52**	0.17	0.79**	-1.84**	-0.18*	-0.05	-0.18*	-0.07
	(3.87)	(1.63)	(3.81)	(-5.56)	(-2.02)	(-0.25)	(-1.99)	(-1.08)
Adj. R^2	17.63	3.00	10.52	13.16	5.27	-0.20	2.87	1.60
lag = 3	0.39**	0.15	0.71**	-1.65**	-0.18*	-0.09	-0.13	-0.06
	(3.22)	(1.29)	(3.42)	(-5.01)	(-2.34)	(-0.47)	(-1.29)	(-1.22)
Adj. R^2	10.10	2.13	8.54	10.53	4.87	0.15	1.46	1.23
lag = 6	0.23*	0.11	0.63*	-1.54**	-0.12	-0.15	-0.06	-0.03
	(2.04)	(0.92)	(2.78)	(-4.57)	(-1.74)	(-0.71)	(-0.57)	(-0.59)
Adj. R^2	3.29	1.19	6.63	9.21	2.12	0.86	0.03	-0.06
lag = 9	0.23*	0.07	0.54*	-1.49**	-0.15**	-0.13	-0.00	-0.08*
	(1.94)	(0.55)	(2.62)	(-4.07)	(-3.20)	(-0.64)	(-0.01)	(-2.83)
Adj. R^2	3.04	0.27	4.84	8.67	3.23	0.66	-0.35	2.21

The nature of foreign EPU

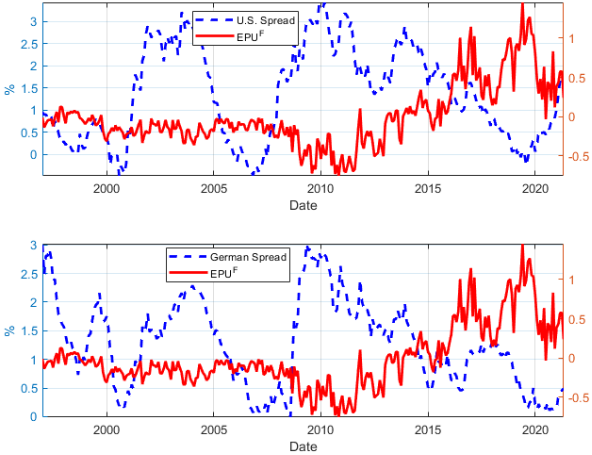
Table 3: "Validation" of EPU Measures

EPU^G	VIX	U.S. Spread	U.S. Def.	log(P/D) U.S.	CFNAI	German Spread	BDI	ΔIP Europ
Contemp.	0.22	-0.09	0.36*	-1.61**	-0.06	-0.40*	-0.31**	-0.02
	(1.55)	(-0.72)	(1.89)	(-3.73)	(-0.73)	(-2.02)	(-3.48)	(-0.27)
Adj. R^2, %	2.80	0.53	1.92	10.10	0.32	8.93	9.63	-0.22
lag =1	0.23	-0.10	0.31	-1.58**	-0.12	-0.42*	-0.30**	-0.05
	(1.51)	(-0.83)	(1.60)	(-3.51)	(-1.39)	(-2.16)	(-3.13)	(-0.77)
Adj. R^2, %	3.31	0.83	1.35	9.68	2.12	9.92	8.90	0.59
lag = 3	0.11	-0.12	0.23	-1.47**	-0.10	-0.44*	-0.27*	-0.04
	(0.71)	(-0.93)	(1.20)	(-3.16)	(-1.38)	(-2.35)	(-2.49)	(-0.72)
Adj. R^2, %	0.41	1.24	0.60	8.30	1.97	11.11	7.23	0.21
lag = 6	-0.04	-0.13	0.17	-1.45*	-0.06	-0.45*	-0.23*	-0.01
	(-0.26)	(-0.97)	(0.77)	(-2.81)	(-0.94)	(-2.42)	(-2.14)	(-0.15)
Adj. R^2, %	-0.26	1.52	0.16	8.10	0.24	11.23	5.43	-0.32
lag = 9	-0.07	-0.14	0.09	-1.43*	-0.08*	-0.08*	-0.41*	-0.05
	(-0.50)	(-1.02)	(0.47)	(-2.73)	(-1.95)	(-2.20)	(-2.08)	(-1.45)
Adj. R^2, %	-0.04	1.82	-0.19	7.87	0.74	8.86	4.51	0.43

The nature of foreign EPU



The nature of foreign EPU



EPU^F measure against U.S. and German BBB and AAA corporate bond spreads.

Prediction exercise: Predictive models

We fit the following statistical models to data:

$$r^i_{t,t+k} = \alpha + \beta_1 EPU^{US}_t + \beta_2 EPU^F_t + \sum_{j=1}^{J} \phi_j f^j_t + \varepsilon^i_{t,t+k}, \qquad (1)$$

- $r^i_{t,t+k}$ is the *cumulative* **excess returns**.
- f^j_t is a pricing factor or control variable.
- $\varepsilon^i_{t,t+k}$ is an error term.

Index-Level Predictability

		CRSP		S&P500		NASDAQ	
		control vars	no control vars	control vars	no control vars	control vars	no control vars
$k = 1$	EPU^{US}	1.95***	0.06	1.92***	-0.05	1.92*	2.40***
		(2.65)	(0.08)	(2.72)	(-0.06)	(1.92)	(2.83)
	EPU^{F}	-1.33**	0.77	-1.34**	0.82	1.22	0.56
		(-2.10)	(1.15)	(-2.13)	(1.28)	(1.14)	(0.78)
	Adj. R^2(%)	37.67	-0.24	35.41	-0.14	3.50	2.13
$k = 3$	EPU^{US}	4.79***	3.57**	4.46***	3.05**	3.36	5.94***
		(2.89)	(2.51)	(2.77)	(2.32)	(1.65)	(3.24)
	EPU^{F}	0.46	1.29	0.54	1.42	4.28	1.99
		(0.27)	(0.79)	(0.33)	(0.90)	(1.65)	(1.21)
	Adj. R^2(%)	19.62	3.64	19.04	3.01	15.55	4.99
$k = 6$	EPU^{US}	7.00**	7.04***	6.60***	6.12***	3.59	9.16***
		(2.26)	(3.45)	(2.65)	(3.24)	(1.10)	(3.15)
	EPU^{F}	2.73	2.52	2.43	2.53	11.01***	5.42*
		(0.97)	(0.95)	(0.91)	(1.00)	(3.01)	(1.91)
	Adj. R^2(%)	25.87	7.27	26.61	5.98	26.93	7.07
$k = 9$	EPU^{US}	8.83*	10.52***	8.20**	9.21***	3.25	12.09***
		(1.94)	(4.21)	(1.90)	(4.04)	(0.69)	(3.00)
	EPU^{F}	6.28**	4.51	5.72**	5.13**	18.00***	10.05***
		(2.19)	(1.68)	(2.13)	(1.71)	(3.52)	(2.74)
	Adj. R^2(%)	32.85	10.50	32.76	8.75	29.73	8.99
$k = 12$	EPU^{US}	7.27	13.74***	6.80*	12.31***	1.83	16.83***
		(1.55)	(4.56)	(1.51)	(4.35)	(0.38)	(3.32)
	EPU^{F}	11.36***	7.08**	10.57***	6.84**	25.25***	14.48***
		(3.43)	(2.13)	(3.47)	(2.22)	(3.92)	(3.45)
	Adj. R^2(%)	39.54	12.83	39.33	11.14	33.75	11.93

Examining the findings

- What are the characteristics of those firms that give rise to predictability?
- We study predictability of all firms in the CRSP/Compustat universe.
- Predictability of portfolio (excess) returns formed on salient characteristics.

Portfolio Returns formed on Size and Book-to-Market

		Single-sort size			Single-sort book-to-market		
		High 30	Low 30	HML30	High 30	Low 30	HML30
$k = 3$	EPU^F	1.11	-0.77	1.88	-1.97	1.93	-3.90**
		(0.67)	(-0.35)	(1.50)	(-0.96)	(1.10)	(-2.15)
	EPU^{US}	1.97	-11.25	13.27	-16.73*	5.70	-22.42**
		(0.24)	(-1.03)	(1.54)	(-1.72)	(0.63)	(-2.50)
	Adj. R^2 (%)	6.28	9.06	15.56	16.12	4.34	20.45
$k = 6$	EPU^F	3.65	0.76	2.88	-3.09	5.82*	-8.91**
		(1.22)	(0.18)	(1.19)	(-0.72)	(1.88)	(-2.29)
	EPU^{US}	29.96*	28.45	1.50	4.17	37.48**	-28.01**
		(1.92)	(1.45)	(0.09)	(0.25)	(2.28)	(-2.00)
	Adj. R^2 (%)	9.17	5.47	11.93	8.15	9.94	14.93
$k = 9$	EPU^F	7.36**	3.18	4.18	-2.35	10.55***	-12.90**
		(1.97)	(0.62)	(1.29)	(-0.44)	(2.65)	(-2.42)
	EPU^{US}	45.54**	53.73*	-8.19	29.50	49.94**	-20.45
		(2.11)	(1.89)	(-0.36)	(1.19)	(2.33)	(-1.08)
	Adj. R^2 (%)	11.75	5.73	13.69	6.23	13.09	12.87
$k = 12$	EPU^F	11.53**	6.43	5.10	-0.75	15.75***	-16.50***
		(2.57)	(1.02)	(1.28)	(-0.12)	(3.28)	(-2.70)
	EPU^{US}	58.44**	87.65**	-29.21	53.72*	62.50***	-8.78
		(2.43)	(2.37)	(-1.01)	(1.85)	(2.60)	(-0.38)
	Adj. R^2 (%)	20.04	14.46	15.53	12.59	21.61	14.96

Portfolio Returns formed on Investment and Operating Profitability

		Double-sort investment and operating profitability		
		Hi Inv/Hi OP	Lo Inv/Lo OP	HiInvHiOP - LoInvLoOP
	EPU^F	0.94	-4.16	5.10**
		(0.45)	(-1.45)	(2.40)
$k = 3$	EPU^{US}	3.80*	7.70***	-3.79
		(1.71)	(2.81)	(-1.60)
	Adj. R^2 (%)	16.72	19.53	21.95
	EPU^F	6.32*	-3.78	10.10***
		(1.88)	(-0.81)	(2.60)
$k = 6$	EPU^{US}	3.18	10.88**	-7.70*
		(0.92)	(2.20)	(-1.92)
	Adj. R^2 (%)	25.68	21.98	24.31
	EPU^F	11.38***	-2.05	13.43***
		(2.90)	(-0.42)	(2.81)
$k = 9$	EPU^{US}	3.73	15.38**	-11.66*
		(0.82)	(2.21)	(-2.16)
	Adj. R^2 (%)	31.37	29.80	32.32
	EPU^F	18.14***	2.88	15.26***
		(3.77)	(0.46)	(2.67)
$k = 12$	EPU^{US}	1.53	13.10*	-11.57*
		(0.32)	(1.72)	(-1.67)
	Adj. R^2 (%)	35.16	31.40	36.73

Portfolio Returns formed on Size/iVol

		Single-sort iVol			Double-sort size and iVol		
		High 20	Low 20	HML20	Big/Hi iVol	Small/Lo iVol	BH-SL iVol
	EPU^F	-0.34	0.20	-0.55	0.23	-0.38	0.60
		(-0.11)	(0.14)	(-0.24)	(0.09)	(-0.20)	(0.31)
$k = 3$	EPU^{US}	6.05*	3.83***	2.21	4.18	3.65**	0.53
		(1.79)	(2.86)	(0.90)	(1.56)	(2.15)	(0.30)
	Adj. R^2 (%)	21.52	15.36	23.10	19.60	27.40	33.04
	EPU^F	6.30	0.86	5.44	5.16	-0.91	6.07
		(1.28)	(0.38)	(1.40)	(1.30)	(-0.23)	(1.54)
$k = 6$	EPU^{US}	5.25	5.95***	-0.71	3.86	7.46**	-3.60
		(0.85)	(2.68)	(-0.17)	(0.73)	(2.07)	(-1.14)
	Adj. R^2 (%)	21.68	23.71	20.96	24.21	15.82	33.09
	EPU^F	14.27**	3.16	11.10**	10.97**	-1.00	11.97**
		(2.37)	(1.40)	(2.12)	(2.32)	(-0.20)	(1.97)
$k = 9$	EPU^{US}	6.78	7.44**	-0.65	3.39	11.26**	-7.88*
		(0.76)	(2.22)	(-0.11)	(0.43)	(1.97)	(-1.87)
	Adj. R^2 (%)	28.26	27.49	27.80	29.20	16.21	31.94
	EPU^F	24.07***	6.60***	17.47**	19.20***	0.27	18.93**
		(3.00)	(2.62)	(2.49)	(3.12)	(0.05)	(2.38)
$k = 12$	EPU^{US}	-0.89	7.42**	-8.31	-4.06	10.71*	-14.77***
		(-0.11)	(2.00)	(-1.45)	(-0.54)	(1.75)	(-3.09)
	Adj. R^2 (%)	33.75	31.46	32.30	33.98	19.34	32.66

Portfolio Returns formed on Size/Cash Flow

		Single-sort CFP			Double-sort size and CFP		
		High 30	Low 30	HML30	Big/Hi CFP	Small/Lo CFP	BH-SL CFP
$k = 3$	EPU^F	-1.95	0.32	-2.28*	-1.78	-1.64	-0.14
		(-1.07)	(0.18)	(-1.78)	(-0.98)	(-0.77)	(-0.12)
	EPU^{US}	3.74**	4.71***	-0.98	3.63**	5.74***	-2.11**
		(2.34)	(2.62)	(-1.16)	(2.18)	(2.81)	(-2.41)
	Adj. R^2 (%)	19.23	19.06	29.31	18.86	24.01	31.74
$k = 6$	EPU^F	-4.24	3.48	-7.73***	-4.02	-0.52	-3.50*
		(-1.18)	(1.26)	(-2.77)	(-1.12)	(-0.13)	(-1.86)
	EPU^{US}	6.40*	6.08**	0.32	6.26*	8.64**	-2.38*
		(1.83)	(2.07)	(0.21)	(1.81)	(2.16)	(-1.68)
	Adj. R^2 (%)	17.59	27.78	29.99	19.64	17.34	26.27
$k = 9$	EPU^F	-5.45	7.83***	-13.28***	-5.16	1.21	-6.37**
		(-1.32)	(2.75)	(-3.28)	(-1.25)	(0.29)	(-2.52)
	EPU^{US}	8.60	7.47*	1.12	8.29	12.33**	-4.04**
		(1.64)	(1.87)	(0.44)	(1.48)	(2.00)	(-2.29)
	Adj. R^2 (%)	19.30	33.94	26.76	21.31	21.14	28.28
$k = 12$	EPU^F	-4.52	13.57***	-18.09***	-4.21	5.18	-9.38***
		(-0.99)	(4.06)	(-3.83)	(-0.91)	(1.11)	(-2.74)
	EPU^{US}	6.44	6.14	0.31	5.99	9.69	-3.70
		(1.02)	(1.48)	(0.08)	(0.94)	(1.47)	(-1.36)
	Adj. R^2 (%)	27.82	38.39	28.68	25.21	24.98	24.37

Portfolio Returns formed on foreign sales

		Single-sort foreign sales			Double-sort size and foreign sales		
		High 30	Low 30	HML30	Big/Hi FS	Small/Lo FS	BH-SL FS
	EPU^F	-0.13	-0.78	0.65	-0.03	-2.15	2.12**
		(-0.08)	(-0.45)	(0.69)	(-0.02)	(-0.98)	(2.05)
$k = 3$	EPU^{US}	5.04**	6.08***	-1.04	5.04**	6.04**	-1.01
		(2.55)	(3.36)	(-1.45)	(2.56)	(2.55)	(-0.97)
	Adj. R^2 (%)	18.72	21.48	5.46	18.77	20.92	27.26
	EPU^F	2.20	0.57	1.63	2.39	-1.59	3.97**
		(0.89)	(0.21)	(1.11)	(0.98)	(-0.47)	(2.25)
$k = 6$	EPU^{US}	5.52*	7.81**	-2.28	5.54*	6.91	-1.37
		(1.67)	(2.58)	(-1.54)	(1.70)	(1.60)	(-0.77)
	Adj. R^2 (%)	26.13	26.14	11.13	26.85	18.51	21.32
	EPU^F	6.02***	4.06	1.96	6.27***	1.14	5.13**
		(2.67)	(1.51)	(1.07)	(2.80)	(0.36)	(2.25)
$k = 9$	EPU^{US}	0.87	5.86	-4.98**	0.95	2.15	-1.20
		(0.30)	(1.53)	(-2.37)	(0.33)	(0.48)	(-0.39)
	Adj. R^2 (%)	36.61	31.32	17.17	37.23	26.16	26.93
	EPU^F	10.20***	7.78**	2.42	10.53***	4.49	6.04**
		(3.83)	(2.52)	(1.19)	(3.97)	(1.18)	(2.20)
$k = 12$	EPU^{US}	-0.88	6.27	-7.14***	-0.78	0.58	-1.37
		(-0.27)	(1.52)	(-2.78)	(-0.25)	(0.12)	(-0.36)
	Adj. R^2 (%)	39.40	32.06	25.26	39.84	28.01	30.20

Portfolio Returns formed on CapEx expenditure

		Single-sort CapEx			Double-sort size and CapEx		
		High 30	Low 30	HML30	Big/Hi CapEx	Small/Lo CapEx	BH-SL CapEx
$k=3$	EPU^F	-0.35	-0.70	0.36	-0.31	-1.65	1.34
		(-0.22)	(-0.27)	(0.26)	(-0.19)	(0.72)	(1.22)
	EPU^{US}	4.14**	5.44**	-1.29	4.14***	5.37***	-1.23
		(2.31)	(2.45)	(-1.43)	(2.33)	(2.61)	(-1.15)
	Adj. R^2 (%)	19.44	20.00	18.13	19.56	22.91	18.16
$k=6$	EPU^F	1.20	2.68	-1.48	1.29	-0.41	1.70
		(0.50)	(0.66)	(-0.97)	(0.97)	(-0.11)	(0.90)
	EPU^{US}	4.44	4.86	-0.42	4.43	5.37	-0.94
		(1.42)	(1.17)	(-0.26)	(1.42)	(1.37)	(-0.57)
	Adj. R^2 (%)	27.36	17.74	13.10	27.56	14.79	14.35
$k=9$	EPU^F	4.41*	7.94*	-3.53	4.52*	2.64	1.88
		(1.88)	(1.75)	(-1.68)	(1.93)	(1.09)	(0.76)
	EPU^{US}	-0.12	-0.92	0.80	-0.11	1.04	-1.14
		(-0.04)	(-0.19)	(0.30)	(-0.03)	(0.21)	(-0.37)
	Adj. R^2 (%)	35.21	25.52	18.90	35.33	21.67	17.64
$k=12$	EPU^F	8.19***	13.02**	-4.83	8.33***	5.74	2.58
		(2.96)	(2.38)	(-1.42)	(3.02)	(1.25)	(0.83)
	EPU^{US}	-1.68	-2.94	1.26	-1.65	0.13	-1.78
		(-0.48)	(-0.53)	(0.35)	(-0.70)	(0.02)	(-0.42)
	Adj. R^2 (%)	38.46	28.18	16.09	38.51	24.46	15.94

What have we learned from these portfolio sorts?

Firms with following features are sensitive to changes in foreign economic policy uncertainty:

- Larger firms
- Those with low book-to-market ratio
- Firms with high investment and high operating profitability
- Larger firms with high idiosyncratic volatility
- Cash-flow constrained firms
- Firms with high foreign sales and large CapEx outlays

Channels of transmission

- How do EPU shocks transmit to equity returns?
- Cash flow, discount rates, premia, growth, or monetary policy shocks?
- We consider each, in turn:
  - Cash flow/discount rate decomposition as in Campbell and Shiller (1988) using a VAR set up.
  - 4-way decomposition as in Ciselak and Pang (2021) using sign-restricted VARs.
- Transmission to the real side still missing.

Foreign EPU and driving shocks of U.S. equity returns

		2-Shock (CS)		2-Shock (SR VAR)		4-Shock (SR VAR)			
		CF	DR	CF	DR	Growth	Monetary	HP	CP
	EPU^F	-0.10	-2.43***	0.65	-0.04	0.36	0.01	0.29	-0.05
		(-0.10)	(-3.30)	(0.94)	(-0.12)	(0.89)	(0.02)	(0.53)	(-0.15)
$k = 3$	EPU^{US}	1.38	0.70	0.89	0.04	0.25	-0.02	0.65	0.06
		(0.84)	(0.72)	(1.52)	(0.10)	(0.83)	(-0.02)	(1.15)	(0.19)
	Adj. R^2 (%)	0.26	3.49	2.38	-0.68	0.14	-0.53	1.44	-0.65
	EPU^F	0.31	-4.78***	1.39	0.27	0.68	0.06	0.71	0.21
		(0.18)	(-3.60)	(1.12)	(0.44)	(1.06)	(0.11)	(0.72)	(0.34)
$k = 6$	EPU^{US}	4.52*	3.03	1.38*	0.10	0.75*	0.06	0.64	0.04
		(1.93)	(1.55)	(1.81)	(0.11)	(1.73)	(0.10)	(0.87)	(0.06)
	Adj. R^2 (%)	3.57	8.15	3.93	-0.57	1.55	-0.68	1.45	-0.57
	EPU^F	1.24	-7.48***	2.58*	0.64	1.27*	0.04	1.30	0.59
		(0.55)	(-4.00)	(1.69)	(0.82)	(1.74)	(0.60)	(1.05)	(0.86)
$k = 9$	EPU^{US}	7.19***	3.99	2.13**	0.38	1.12**	0.13	1.01	0.40
		(2.71)	(1.57)	(1.97)	(0.30)	(1.99)	(0.15)	(1.04)	(0.42)
	Adj. R^2 (%)	6.69	10.16	7.89	0.11	3.64	-0.71	3.70	0.35
	EPU^F	2.18	-10.67***	3.61**	0.81	1.62**	0.11	1.99	0.71
		(0.83)	(-4.63)	(2.04)	(0.88)	(1.99)	(0.12)	(1.38)	(0.90)
$k = 12$	EPU^{US}	10.25***	5.42*	2.78	1.50	1.18	0.65	1.60	0.84
		(3.29)	(1.68)	(1.67)	(0.87)	(1.52)	(0.64)	(1.18)	(0.68)
	Adj. R^2 (%)	10.95	12.48	10.04	1.27	3.60	-0.23	4.98	1.23

Cross-Sectional Factor Premiums

- Conditional premiums accrued to U.S. and foreign EPU.
- We use the two-stage method of Fama and McBeth (1973, JPE).
- We include factors (market wide and traded) and firm-specific characteristics (not today).

Properties of Factor Mimicking Portfolios

When we include non-traded factors like EPU^{US}, EPU^{F}, or VIX , we replace them with factor mimicking portfolios, following Breeden et al. (1989, JF).

	F_{EPU^F}	F_{EPU^F}	F_{EPU^F}	$F_{EPU^{US}}$	$F_{EPU^{US}}$	$F_{EPU^{US}}$	F_{VIX}	F_{VIX}	F_{VIX}
$\hat{\epsilon}^{EPU^F}$	0.07***	0.07***	0.07***		0.01	0.01		-0.04	-0.03
	(5.14)	(5.33)	(4.97)		(0.60)	(0.43)		(-0.84)	(-0.72)
$\hat{\epsilon}^{EPU^{US}}$		0.01	0.01	0.08***	0.07***	0.07***		0.02	0.01
		(0.84)	(0.79)	(5.46)	(4.68)	(4.47)		(0.80)	(0.44)
$\hat{\epsilon}^{VIX}$		-0.17**	-0.14*		0.24***	0.20*	1.47***	1.43***	1.37***
		(-1.94)	(-1.73)		(2.16)	(1.84)	(5.60)	(5.38)	(5.51)
$\Delta Default$			-0.003			0.04***			0.11***
			(-0.18)			(2.01)			(2.38)
$\Delta Term$			0.02**			0.01			-0.05
			(2.00)			(0.67)			(-1.29)
$\Delta \log(P/E)$			0.11			-0.08			-0.05
			(1.27)			(-0.95)			(-0.20)
Adj. R^2 (%)	6.98	7.98	9.21	7.19	8.30	8.23	14.39	14.50	16.96

Fama-MacBeth Regressions

- In the first stage, we fit a modified version of model III:

$$r_t^j - r_t^f = \alpha_j + \beta_1^j F_t^{EPU^{US}} + \beta_2^j F_t^{EPU^F} + \sum_{n=3}^{N} \beta_n^j F_t^{X_n} + \varepsilon_t^j, \forall j \tag{2}$$

- In the second step, use cross-sectional regressions to evaluate whether differences in the estimated factor loadings explain excess returns:

$$r_t^j - r_t^f = \lambda_t^0 + \lambda_t^1 \hat{\beta}_1^j + \lambda_t^2 \hat{\beta}_2^j + \sum_{n=3}^{N} \lambda_t^n \hat{\beta}_n^j + \sum_{m=1}^{M} \varphi_m \gamma_{t-1,m}^j + \epsilon_t^j, \forall t, \tag{3}$$

λ_t^0 is the pricing error at time t, λ_t^i is the risk premium on factor i at time t, $\hat{\beta}_t^j$ are the estimates from the first step, $\gamma_{t-1,k}^j$ is characteristic k for portfolio j as of time t-1 (calculated as the average of stock-level characteristics), and ϕ_k is the regression coefficient for characteristic $\gamma_{t-1,k}^j$. The risk premium on factor F_t^X is computed as the average of the coefficients from the T cross-sectional regressions, and its statistical significance is assessed with Shanken-adjusted standard errors with Newey-West corrections:

$$\hat{\lambda}^i = \frac{1}{T} \sum_{t=1}^{T} \hat{\lambda}_t^i. \tag{4}$$

Fama-MacBeth Regressions

	Estimated premiums (in % per month)								
Mkt	0.82***	0.82***	0.82***	0.83***	0.83***	0.83***	0.82***	0.83***	0.83***
	(2.82)	(2.85)	(2.81)	(2.84)	(2.83)	(2.91)	(2.78)	(2.81)	(2.85)
SMB	0.37*	0.38*	0.37*	0.34*	0.33*	0.34*	0.36*	0.32	0.32
	(1.71)	(1.74)	(1.72)	(1.63)	1.62	(1.61)	(1.65)	(1.56)	(1.55)
HML	0.78***	0.76***	0.78**	0.86***	0.84***	0.86***	0.76***	0.84***	0.84***
	(2.37)	(2.34)	(2.37)	(2.50)	(2.40)	(2.06)	(2.31)	(2.51)	(2.56)
Mom	0.40	0.40	0.41	0.41	0.41	0.41	0.41	0.43	0.42
	(1.25)	(1.23)	(1.24)	(1.28)	(1.29)	(1.20)	(1.28)	(1.32)	(1.34)
LIQ_M									0.27
									(0.17)
F_{EPU^F}		-0.02**			-0.024**		-0.03**	-0.02**	-0.02*
		(-2.03)			(-2.01)		(-1.98)	(-1.97)	(-1.82)
$F_{EPU^{US}}$			-0.015*			0.00	0.002	-0.001	-0.001
			(-1.74)			(0.08)	(1.12)	(-0.85)	(-0.44)
F_{VIX}				-0.015***	-0.019***	-0.015***		-0.015**	-0.01*
				(-2.65)	(-2.86)	(-2.61)		(-2.19)	(-1.78)

Conclusion

- We extend the evidence presented by Pastor and Veronesi (2013), Brogaard and Detzel (2015), and Bali et al. (2017) to international sources of economic uncertainty.
- It has predictive power for aggregate indexes, marketwide, large-cap, and mid-cap between 6 to 12-months ahead.
- Size, capital expenditure, foreign sales, and profitability appear to be important identifiers.

Firm Characteristics

- Monthly co-skewness (CoSkew) of Harvey and Siddique (2000, JF) for each stock:

$$CoSkew_t^j = \frac{\mathbb{E}\left[\hat{\epsilon}_t^j (r_t^m - r_t^f)^2\right]}{\sqrt{\mathbb{E}\left[\hat{\epsilon}_t^{j2}\right]}\mathbb{E}\left[(r_t^m - r_t^f)\right]}, \tag{5}$$

- Amihud (2002, JFM) illiquidity (ILLIQ):

$$ILLIQ_t^j = \mathbb{E}\left[\frac{|r_d^j|}{Vol_d^j}\right], \tag{6}$$

- Ang, Hodrick, Xing, and Zhang(2006, JF) use idiosyncratic volatility (*IVOL*), computed as the monthly standard deviation of daily estimated residuals from the following regression:

$$r_d^j - r_d^f = \nu_j + \vartheta_1^j Mkt_d + \vartheta_2^j SMB_d + \vartheta_3^j HML_d + \varepsilon_d \tag{7}$$

Appendix 1: Firm Characteristics

- Monthly co-skewness (CoSkew) of Harvey and Siddique (2000, JF) for each stock:

$$CoSkew_t^j = \frac{\mathbb{E}\left[\hat{\epsilon}_t^j (r_t^m - r_t^f)^2\right]}{\sqrt{\mathbb{E}\left[\hat{\epsilon}_t^{j2}\right]}\mathbb{E}\left[(r_t^m - r_t^f)\right]}, \tag{8}$$

- $\hat{\epsilon}_t^j = (r_t^j - r_t^f) - \left[\hat{\alpha}_j + \hat{\beta}_j (r_t^m - r_t^f)\right]$, (r_t^m) returns of CRSP vw index. r_t^f is 1-month T-bill rate. We use a window of 60 monthly returns to recover these residuals.
- Amihud (2002, JFM) illiquidity (ILLIQ):

$$ILLIQ_t^j = \mathbb{E}\left[\frac{|r_d^j|}{Vol_d^j}\right], \tag{9}$$

where $|r_d^j|$ are absolute returns and Vol_d^j is the dollar value of trading of stock j on day d. We scale the measure by 10^6, and require at least 15 observations per month to include a stock.
- Ang, Hodrick, Xing, and Zhang(2006, JF) use idiosyncratic volatility ($IVOL$), computed as the monthly standard deviation of daily estimated residuals from the following regression:

$$r_d^j - r_d^f = \nu_j + \vartheta_1^j Mkt_d + \vartheta_2^j SMB_d + \vartheta_3^j HML_d + \varepsilon_d \tag{10}$$

where Mkt_d, SMB_d and HML_d are daily Fama-French factors.

Appendix 2: Construction of Factor-Mimicking Portfolios

1. Fit variable X to a suitably chosen statistical model, and collect residuals.

$$X_t = a_0 + a_1 X_{t-1} + a_3 Mkt_{t-1} + \epsilon_t^X \quad (11)$$

$$\hat{\epsilon}_t^X = X_t - \left(\hat{a}_0 + \hat{a}_1 X_{t-1} + \hat{a}_3 Mkt_{t-1}\right). \quad (12)$$

2. Next, using these residuals (or innovations in X) and a set of basis assets (for example, 25 Fama-French size and momentum portfolios) for the whole sample, estimate the following model:

$$\hat{\epsilon}_t^X = c_X + b_X'(r_t^e - r_t^f) + e_t^X, \quad (13)$$

where $r_t^e - r_t^f$ are excess returns of these basis assets and e_t^X is an error term.

3. Then the factor-mimicking portfolios are

$$F^X = \hat{b}_X'(r_t^e - r_t^f). \quad (14)$$