

DOES ACADEMIC RESEARCH DESTROY STOCK RETURN PREDICTABILITY?

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Our Research Question

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- Academic research has uncovered many predictors of cross-sectional stock returns
 - e.g., size, momentum, book-to-market, etc....
- **Does return-predictability typically persist outside the original sample?**
 - The answer could help explain why the predictability is there on the first place
- We explore this question using 95 “**predictors**” documented in published academic studies

The Structure of Our Tests

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- ❑ We compare returns over 3 periods:
 - ❑ Sample period from the original study
 - ❑ Post-sample, but pre-publication
 - Out-of-sample, but paper is not widely distributed
 - ❑ Post-publication or post-SSRN
 - Paper distributed, more people know than before

Does Predictability = Statistical Artifacts?

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- If so, predictability should disappear immediately out of sample, pre-publication
 - ▣ Perhaps researchers choose methods and samples that give them their desired result
 - E.g., Data snooping, Lo and MacKinlay (1990)
 - ▣ Multiple testing bias - if researchers try thousands of strategies, it is not surprising that 95 work
 - Articulated by Fama (1998)

Does Predictability Reflect Risk and Costs?

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- Then predictability should be similar in-sample, out-of-sample, and post-publication
 - ▣ Sharpe (1964) – Systematic risk
 - ▣ Amihud and Mendelson (1986) – Transaction costs

Does Predictability Reflect Mispricing?

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- Then publication should attract arbitrageurs, who correct the mispricing
 - ▣ Pure arbitrage: The effect disappears entirely
 - ▣ Costly arbitrage: Effect is reduced, not eliminated
 - Delong et al (1990)
 - Pontiff (1996, 2006); Shleifer and Vishny (1997)

Main Findings – Suggest Mispricing

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- Out-of-sample, pre-publication decline is 25%
 - ▣ 1% monthly return declines to 0.750%
 - ▣ Upper bound estimate of statistical biases

- Post-publication decay is 56%
 - ▣ 1% monthly return declines to 0.44%
 - ▣ Implies a publication effect of $56\% - 25\% = 31\%$

The Costs and Benefits of Arbitrage

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- Evidence of costly arbitrage
 - ▣ Predictors with larger in-sample returns and t-statistics decline more post-publication
 - ▣ Predictors that violate weak-form market efficiency decline more
 - ▣ Predictors concentrated in stocks that are less costly to transact and hold decline more

Other Post-Publication Changes

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- After a predictor is published...
 - ▣ Short interest increases on the short side
 - ▣ Trading volume increase in portfolio stocks
 - ▣ Its correlation with unpublished predictors decreases
 - ▣ Its correlation with published predictors increases

Related Studies – Did We Already Know This?

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- Jegadeesh and Titman (2001)
 - ▣ Momentum persists out-of-sample

- Schwert (2003)
 - ▣ No size or book-to-market alphas

- Haugen and Baker (1996)
 - ▣ Compare 11 predictors in two subsamples; all 11 survive

- Chordia, Subrahmanyam, and Tong (2013)
 - ▣ Compare 7 predictors in two more recent subsamples; none survive

One way this could affect things in practice

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- Consider back-testing a strategy that uses a predictor from a paper published in 2010
- The back-test is from 2003-2013
 - ▣ Most of the back test (7 of 10 years) is pre-publication
 - ▣ Yet the expected returns are lower post-publication
 - ▣ The back-test's returns therefore have an upward bias

Choosing the Predictors

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- Peer-reviewed academic studies
 - Primarily in top 3 finance journals
 - Characteristics that can be constructed with COMPUSTAT, CRSP, and IBES data
 - Cross-sectional predictors only

The Predictors

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- 95 in Predictors in Total
 - Oldest: Blume and Husic (1972)
 - Include a few forthcoming papers
- We include variables with strong theoretical motivations
 - Fama and MacBeth (1973)--market beta
 - Amihud (2002)—illiquidity
- Most predictors are not theoretically motivated

Creating the Sample

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- Constructing portfolio returns
 - ▣ Long-short quintile returns (for non-binary characteristics)
- Each predictor has 3 distinct periods
 - ▣ In sample — average, 329 months
 - ▣ Out-of-sample but pre-publication — average, 44 months
 - ▣ Post-publication — average, 141 months
- We estimate pooled regressions, so our tests are powerful!!

Summarizing the Characteristics

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Number of Predictors	95
Predictors with significant returns in-sample	80 (84%)
Mean Publication Year	2000
Median Publication Year	2001
Predictors from Finance journals	66 (70%)
Predictors from Accounting journals	27 (28%)
Predictors from Economics journals	2 (2%)
Mean Portfolio Return In-Sample	0.667
Mean Portfolio Return Out-of Sample	0.464
Mean Portfolio Return Post-Publication	0.294

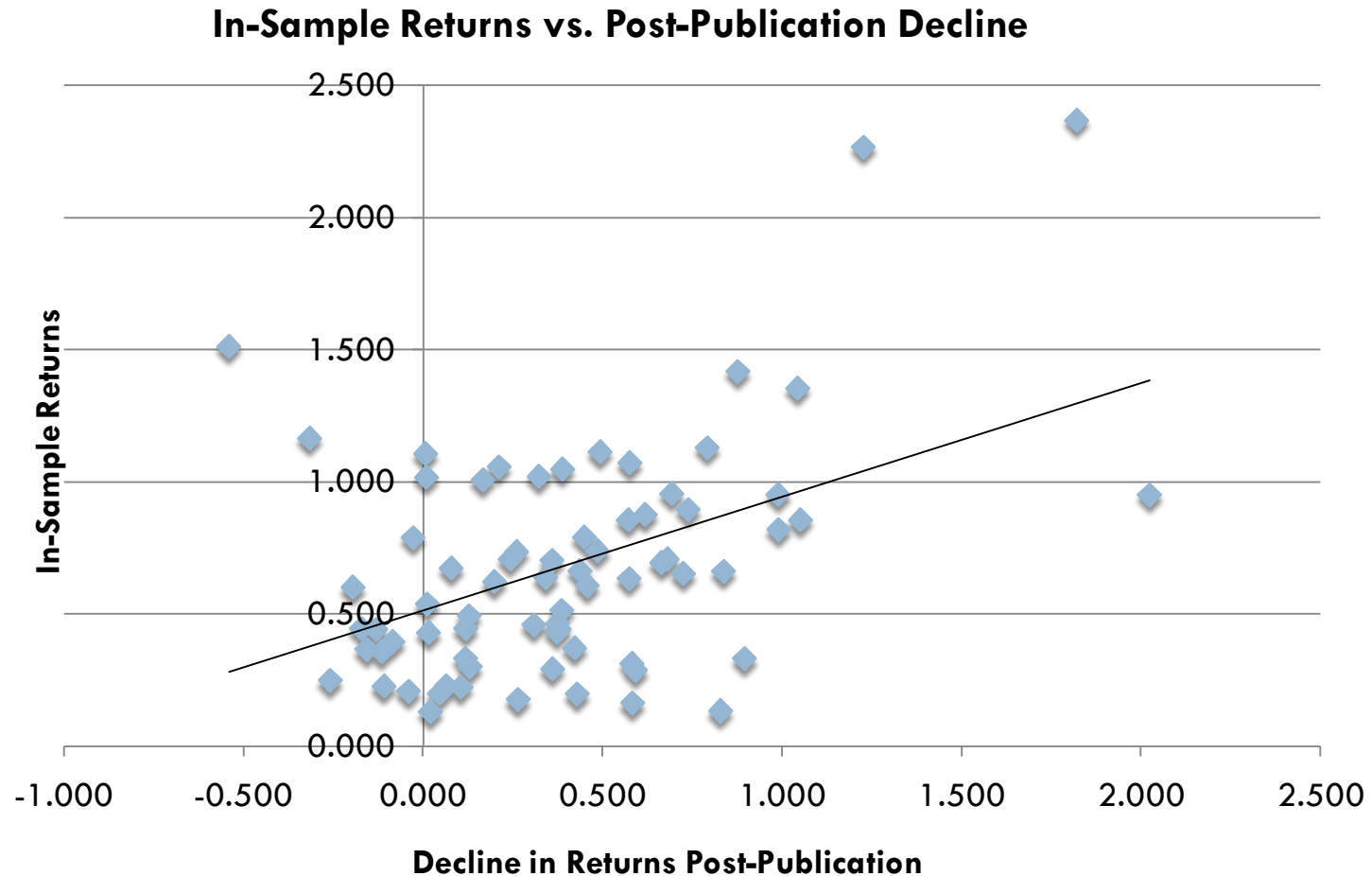
Main Regression Results

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Variables	(1)	(2)	(3)	(4)	(5)
Post-Sample (S)	-0.165* (0.094)	-0.125 (0.085)	-0.135 (0.089)	0.172 (0.130)	0.063 (0.156)
Post-Publication (P)	-0.374*** (0.112)	-0.318*** (0.100)	-0.345*** (0.100)	0.012 (0.125)	-0.104 (0.162)
In-Sample Mean			0.816*** (0.075)		
S x Mean				-0.497** (0.249)	
P x Mean				-0.525*** (0.197)	
S x t-statistic					-0.056** (0.030)
P x t-statistic					-0.068*** (0.025)

In-Sample Returns vs. Post-Publication Decay

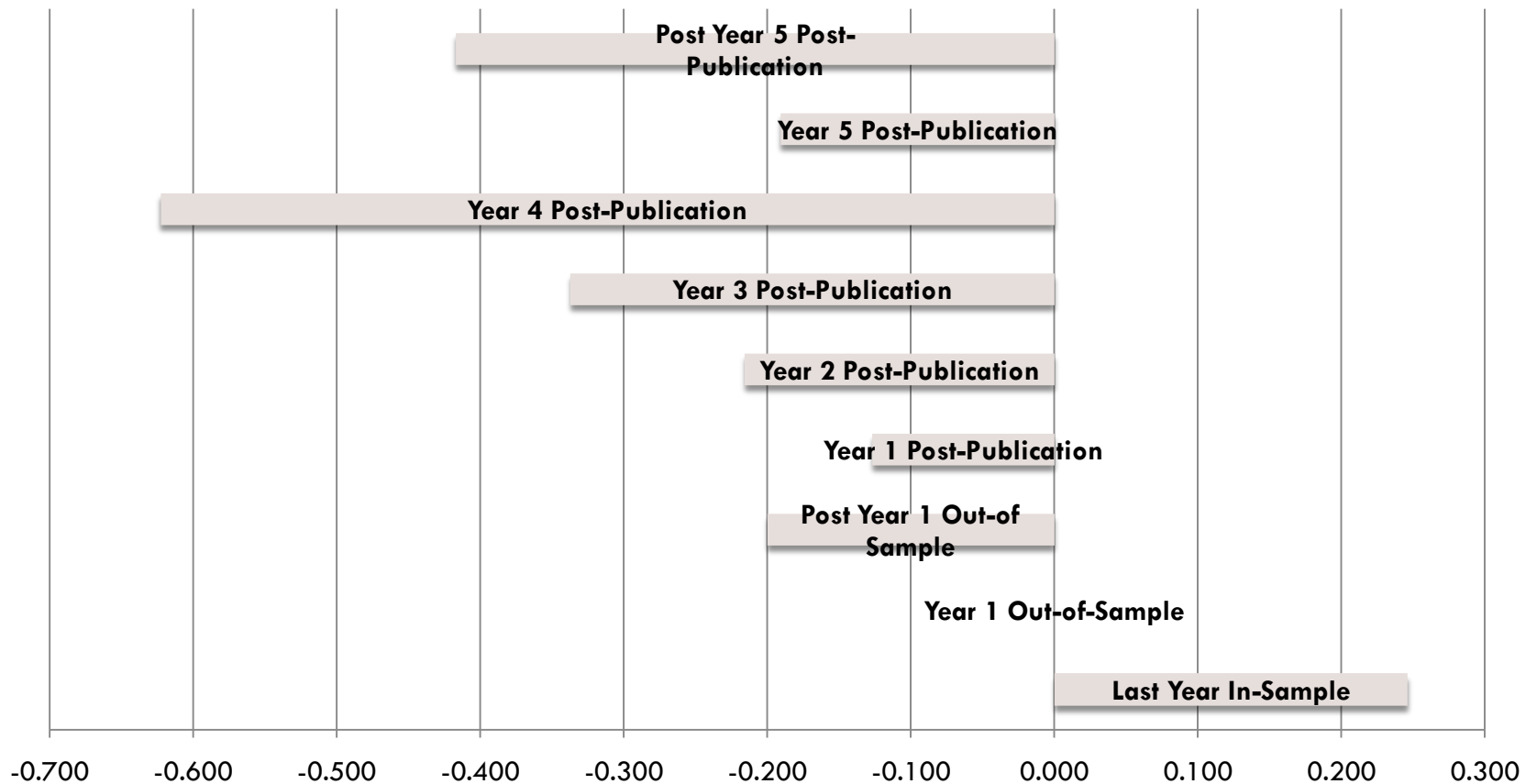
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In “Event” Time

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Difference in Monthly Returns Relative to in-Sample Mean



Trends and Persistence

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- Perhaps our findings simply reflect a time trend in anomaly profits
 - ▣ Pontiff (1996): Lower costs = less mispricing
 - ▣ Goldstein, Irvine, Kandel, and Wiener (2009): Brokerage commissions dropped from 1977 to 2004
 - ▣ Anand, Irvine, Puckett, and Venkataraman (2012): Execution costs have fallen over the last decade

Time Trends and Persistence

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Variables	(1)	(2)	(3)	(4)
Time	-0.095***			
1993	0.343**			
1-Month Ret.			0.100***	
12-Month Ret.				0.020***
Post-Sample	-0.179*	-0.162*	-0.143	-0.127
Post-Pub.	-0.346**	-0.266*	-0.333***	-0.278***
Time FE?	No	Yes	No	No

Returns by Predictor Type

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- We explore returns and decays by predictor type
 1. Event – Corporate events, changes in performance, downgrades
 2. Fundamental – constructed only with accounting data
 3. Market – Constructed only with market data and no accounting data
 4. Valuation – Ratios of market values to fundamentals

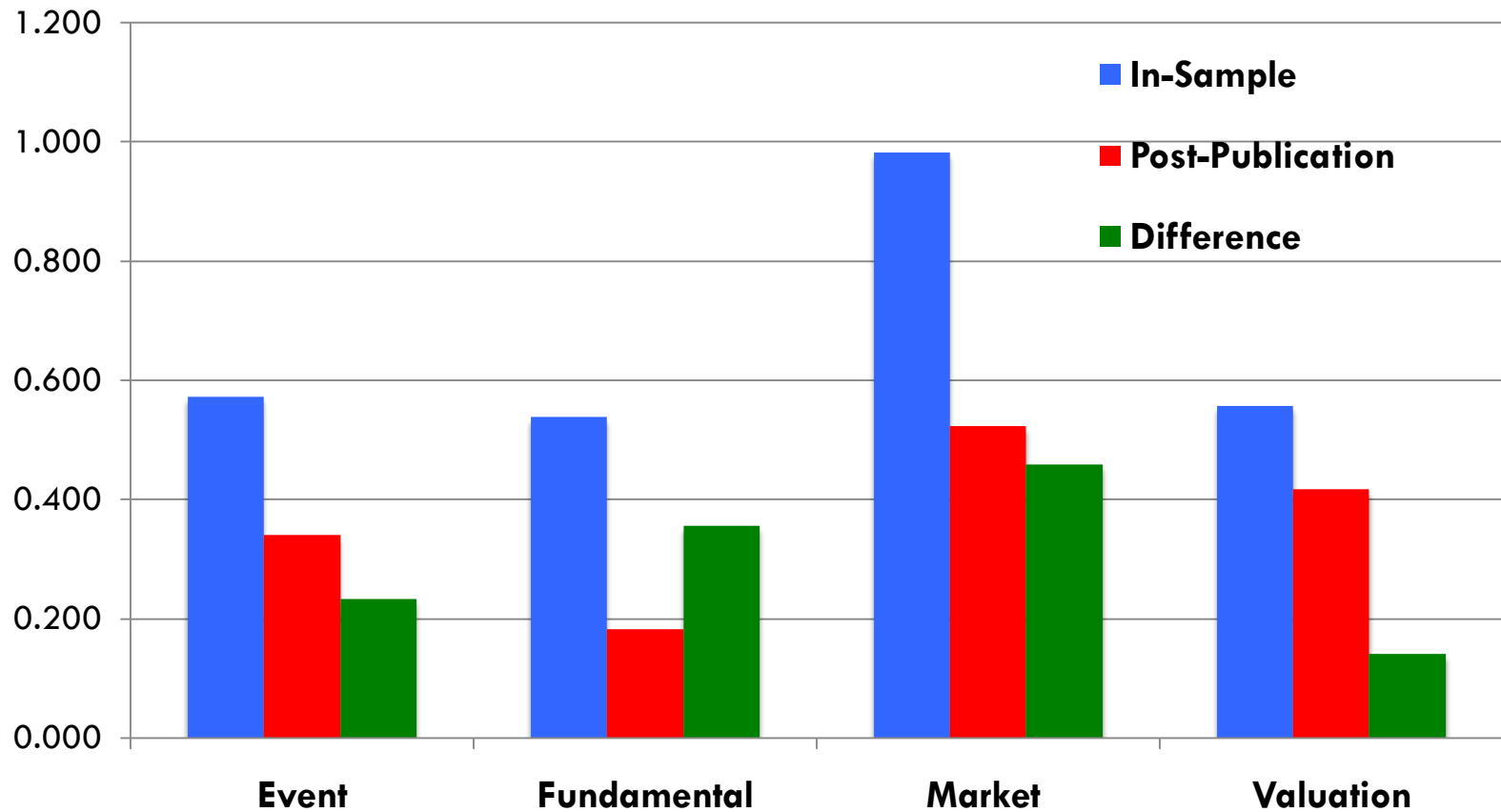
Returns by Predictor Type

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- Market predictors have the highest in-sample returns
- Market predictors also decline the most post-publication
 - ▣ However this decline is not statistically significant at conventional levels

Returns and Decay by Predictor Type

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Costly Arbitrage

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- Costly Arbitrage: Predictors that are *less* costly to arbitrage have *lower* alpha, especially post-pub.
 - Size
 - Dollar Volume, Turnover
 - Dividends
 - Idiosyncratic risk
 - Principal Component of all five

High Arbitrage Costs = Less Alpha

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	Publication Dummy (P)	Index	P x Index		Costly + P * Index
Coefficient t	-0.272**	-0.046***	-0.036		-0.082***

**Maximum index value is 3.87

***High* index values mean *less* costly to arbitrage

Trading Activity in Portfolio Stocks

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- If academic research attracts arbitrageurs, then it should cause an increase in trading in predictor portfolios
- We test whether trading in the stocks that make up predictor portfolios increase out-of-sample and post-publication.

Trading Activity ↑ in Portfolio Stocks

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Variables	Variance Rank	Trading Volume Rank	Dollar Volume Rank	Difference in Short Interest
Post-Sample (S)	0.006*** (0.001)	0.006*** (0.001)	0.010*** (0.001)	0.125*** (0.017)
Post-Publication (P)	0.004*** (0.001)	0.010*** (0.001)	0.013*** (0.001)	0.354*** (0.014)
Constant	0.527*** (0.001)	0.515*** (0.001)	0.445*** (0.001)	0.173*** (0.000)

Correlations Across Predictors

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- If predictors reflect mispricing, and mispricing has common causes (e.g., sentiment)....
 - We might expect in-sample predictor-portfolio returns to be correlated

- If publication attracts arbitrageurs.....
 - Then published predictor-portfolios may be more highly correlated with other published predictor-portfolios

Publication Affects Correlations

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Variables	Return
In-Sample Index Return	0.758*** (0.034)
Post Publication Index Return	-0.001 (0.010)
P x In-Sample Index Return	-0.706*** (0.055)
P x Post-Pub. Index Return	0.626*** (0.057)
Post-Publication (P)	-0.013 (0.077)
Constant	0.085** (0.041)

Conclusions

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- Evidence suggests some academic research can make markets more efficient
 - ▣ Return-predictability falls 56% post-publication
 - ▣ Predictor portfolios that decline the most have the largest in-sample returns
 - ▣ Trading activities increase in predictor portfolios
 - ▣ Predictor correlations change with publication

Future Work

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- “User’s Guide to the Cross-Section of Stock Returns”
 - ▣ What matters most for the cross-section of expected returns?
 - ▣ Size, book-to-market, and momentum get the most academic attention
 - ▣ Our early tests suggest that other characteristics are more important

Future Work (with Joey Engelberg)

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- “The cross-section of *Unexpected Returns*”
- Risk Story: Predictor returns are explained by differences in discount rates
 - ▣ Returns are *expected*
- Behavioral Story: Predictor returns are explained by biased expectations
 - ▣ Returns are *unexpected*
- Prior evidence that a few strategies have especially high returns on earnings announcement days
- We’ll examine this effect for close to 100 predictors