Feedback on Emerging Corporate Policies

Sean Cao, Itay Goldstein, Jie He & Yabo Zhao

Discussion
Randall Morck

© Copyright 2024 Randall Morck, all rights reserved,

Information Content of Stocks Provides Feedback

Five-day [-2,+2] CAR around corporate disclosures re. AI & green tech investment plans

- ❑ Textual analysis of earnings conference calls & 8-K filings
- ❑ 48,181 AI-related disclosures by 4,568 unique firms in 2010 to 2019 (1disclosure/firm every 2 years)
- ❑ 106,650 green-related disclosures by 3,178 unique firms in 2006 to 2019 (2 disclosures/firm every year)
- ❑ NYSE + NASDAQ list about 6,200 firms so 75% & 50% of firms are event firms

Actual investment (year prior to year after disclosure) higher (lower) as CAR higher (lower)

- ❑ AI investment inferred from increase in AI-related job postings
- ❑ Green investment inferred from decrease in Green House Gas (GHG) emissions

Baseline results

$$\frac{\Delta\left(\Delta AI_{job\ postings}\right)}{1\ \sigma\ \Delta CAR} = +0.8\% = 9\% \times \mu_{\Delta AI\ job\ postings}$$

$$\frac{\Delta(\Delta GHG)}{1\ \sigma\ \Delta CAR} = -8.1\% = 10.7\% \times \mu_{\Delta GHG}$$

- ❑ Effect stronger for unfavorable stock price reactions if
  - Outside market participants more knowledgeable about emerging technologies
  - Managers have stronger incentives to promote investments in such fields
- ❑ No reaction for non-emerging-technology investment plans if managers have domain knowledge
- ❑ Using market feedback (esp. if negative) rewarded by superior long-run operating & stock performance
- ❑ Different learning patterns for AI and green technologies.

© Copyright 2024 Randall Morck, all rights reserved,

Managers Take Criticism Well?

Wilson, James Q. 1967. Bureaucracy

- Success rising through a bureaucracy = effective blame avoidance

Strategies

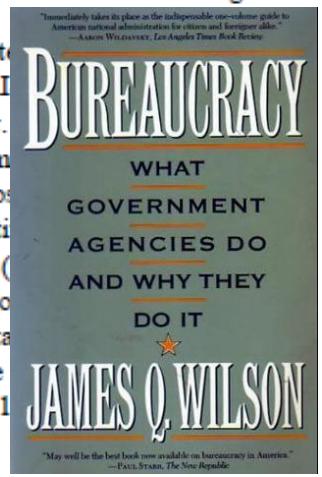
- Do nothing so as to do nothing wrong
- Collective decision-making to spread blame
- Automate decisions with checklists and flow charts (blame people who designed checklists or flow charts)
- Hire consultants (no actual economic value, but paid to serve as blame attractors)

Relevance here

- Feedback from share prices explains why private sector firms usually (?) seem less inefficient than public sector bureaucracies?
- Private equity puts this at risk?

Table 3: Investment response to emerging-technology-related market feedback: Positive and negative market reactions

This table presents the analyses of a firm's investment response to emerging-t
feedback when the reaction is either positive or negative. Panels A and B study AI
investments, respectively. In Panel A, the dependent variable is Δ*AI Job Postings*.
variable is Δ*Green Job Postings*. *FB* is the firm's five-day cumulative abnorm
disclosure date. The sample in Column (1) of each panel includes corporate disclo
reactions (i.e., *FB*>0), and that in Column (2) includes disclosures with negati
FB<0). All other variables are defined as in Table 1 and Table 2. Column (
disclosures in our baseline analysis in Table 2. *PosFB* equals *FB* if *FB*>0, and zero
FB when *FB*<0, and zero otherwise. Standard errors are clustered by firm. F-sta
p-value testing the difference between coefficients of *PosFB* and *NegFB* are
reported in parentheses. ***, **, and * denote statistical significance at the 1
respectively.



Panel A: AI investment				Panel B: Green investment			
Dependent Var.	ΔAI Job Postings			Dependent Var.	ΔGreen Job Postings		
Subsample	Positive FB	Negative FB	Full	Subsample	Positive FB	Negative FB	Full
	(1)	(2)	(3)		(1)	(2)	(3)
FB	0.039***	0.078**		FB	-0.034	0.080*	
	(3.06)	(2.48)			(-0.75)	(1.79)	
PosFB			0.021**	PosFB			-0.009
			(2.00)				(-0.24)
NegFB			0.070***	NegFB			0.105***
			(2.93)				(2.90)
F-stat			3.04	F-stat			3.27
P-value			0.081	P-value			0.071
Controls	Yes	Yes	Yes	Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Firm FE	Yes	Yes	Yes
Ind. × Year FE	Yes	Yes	Yes	Ind. × Year FE	Yes	Yes	Yes
Observations	19,792	18,521	39,521	Observations	40,992	39,206	80,596
R-squared	0.591	0.578	0.551	R-squared	0.334	0.332	0.290

© Copyright 2024 Randall Morck, all rights reserved,

© Copyright 2024 Randall Morck, all rights reserved,

Little Discussion of Identification

Identification is usually a non-issue in an event study

- Event studies are the original finance dif-in-dif tests
- Stock rises when firm fires poor CEO
  - A bad CEO being fired caused the stock price to rise?
  - Expectation that the stock price would rise "caused" the board to fire the CEO
  - Something else (CEO plagiarism scandal) caused price to rise & CEO to be fired

Tobin's q theory of investment

- Disequilibrium adjustment feedback (Lyapunov) function

$$\frac{dk}{dt} = f\left(k - k^{-1}(q^*(k^*)\right)$$

  - If Kakutani's fixed point theorem holds, there is a solution
  - Is there a meaningful identification issue in a feedback loop?

Identification issues from using a fixed point theorem to solve a feedback model?

  - If $q(k)$ then investment change causes market valuation change
  - If $k(q)$ then market valuation change causes investment change

- CAR < 0 (given $dk/dt > 0$) means what?
  - CAR < 0 means shareholders see or foresee non-value-maximizing supra-optimal k
  - Less shareholder democratic firms have more non-value-maximizing management

In this world of feedback loops, the concept of causality looses coherence

- What would a reverse causality story inconsistent with the paper's story be?
- What would latent variable causality story inconsistent with the paper's story be?

© Copyright 2024 Randall Morck, all rights reserved,

Placebo Test

4.4 Emerging-technology investments and market reactions in non-disclosure windows

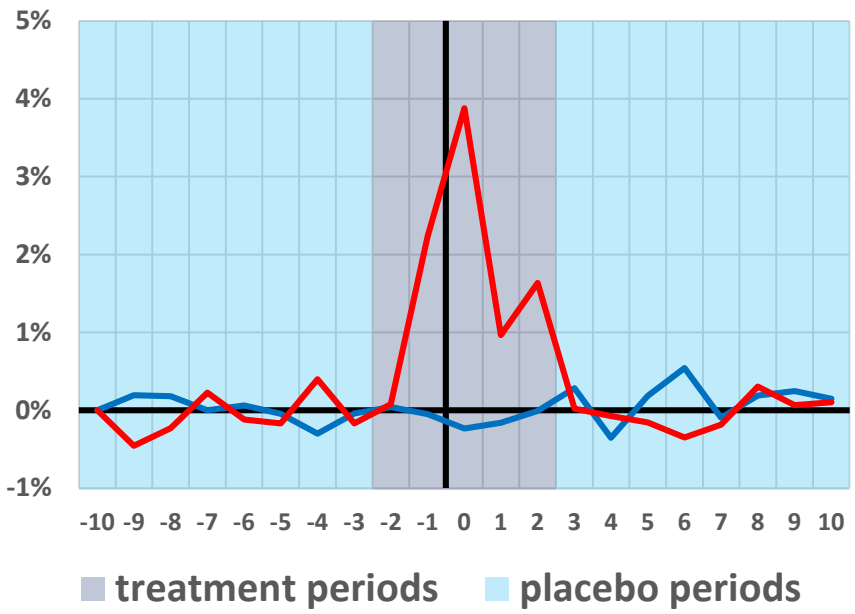
To strengthen the inference about managerial learning from market feedback to specific disclosures, we perform a placebo test by examining the association between emerging investment changes and cumulative abnormal returns in 5-day windows other than that surrounding the same disclosure event (i.e., days [-2, 2]). Specifically, we look at the 5-day cumulative abnormal return before or after the same disclosure event (i.e., days [-7, -3] or days [3, 7]).

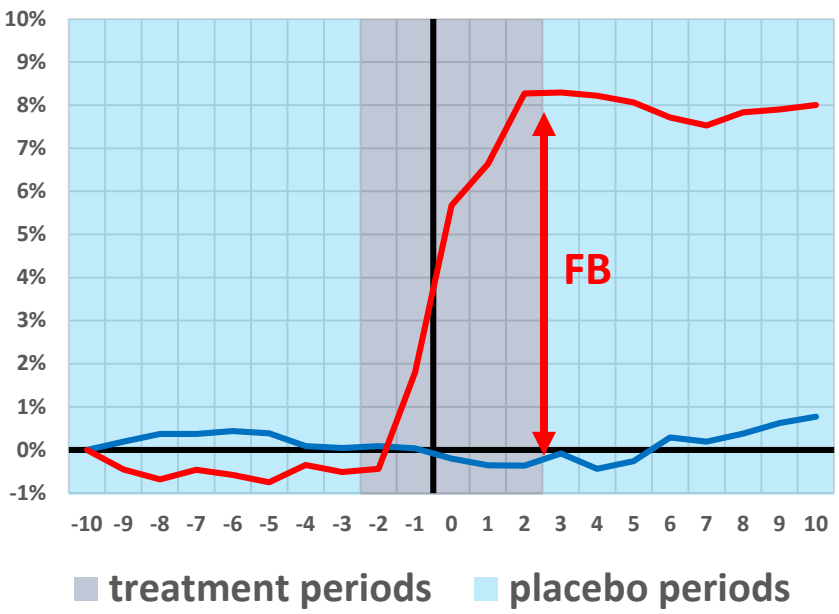
Table 11 presents the results. The sample of corporate disclosures and the two main dependent variables, Δ*AI Job Postings* and Δ*Green Job Postings*, are the same as those in our baseline analysis. In Panel A, *PlaceboFB[-7, -3]* is the five-day cumulative abnormal return from seven days to three days prior to the disclosure date (i.e., day 0) of a firm's emerging-technology related corporate disclosure. In Panel B, *PlaceboFB[3, 7]* is the five-day cumulative abnormal return from three days to seven days after such a disclosure date. The small and insignificant coefficients of *PlaceboFB[-7, -3]* and *PlaceboFB[3, 7]* in both panels suggest that firms' investment adjustments in emerging technologies are only related to the market reactions in the narrow announcement window but not in other 5-day windows immediately before or after the same disclosure event.

- **Test some obviously "irrelevant" hypothesis and get insignificance proves nothing**
- **The number of "irrelevant" hypotheses one could test is unbounded**
- **Showing that one "irrelevant" hypothesis gets insignificant results is not proof none do**
- **One might run all conceivable irrelevant hypotheses and find that 5% pass 5% significance**

© Copyright 2024 Randall Morck, all rights reserved,

An Event Study Has a Built in Placebo Test





- **Standard significance tests in event studies**
  - **Test to reject equal mean asset pricing model residuals in treatment period versus placebo periods (zero if iid)**
  - **Test to reject sum of asset pricing model residuals in treatment periods equal to that predicted by distribution of residuals in placebo periods (zero if iid)**
- **Robustness tests re. "cumulative abnormal return" better use of reader's time?**
  - **Alternative windows (long enough to filter out partial reversals?)**
  - **Alternative definitions of systematic risk?**

© Copyright 2024 Randall Morck, all rights reserved,

Econometrics

$$\Delta Investment_{f,y(q(d))} = \alpha + \beta_1 FB_{f,d} + \beta_2\, Firm\ control_{f,q(d)-1} + FE_f + FE_{i(f),y} + \varepsilon_{i,d,q}$$

Change from year prior to the year containing the quarter containing the event day to year following the year containing the quarter containing the event day

[-2, +2] car <u>estimate</u> from an asset pricing model ???

$ln(sales_{f,q(d)-1})$
$R\&D_{f,q(d)-1}/sales_{f,q(d)-1}$
$ROA_{f,q(d)-1}$
$ln\left(1 + jobs_{f,y(q(d))+1}\right) - ln\left(1 + jobs_{f,y(q(d))-1}\right)$
Why not a Tobin's Q
Recycles firm-year or firm-quarter observations

Cluster by firm not by year

Firm fixed-effects *and/or* Industry x year fixed effects

Consistent, but bigger firms have bigger LHS & bigger $\varepsilon_{i,d,q}$

$$ln\left(1 + AI\ jobs_{f,y(q(d))+1}\right) - ln\left(1 + AI\ jobs_{f,y(q(d))-1}\right)$$

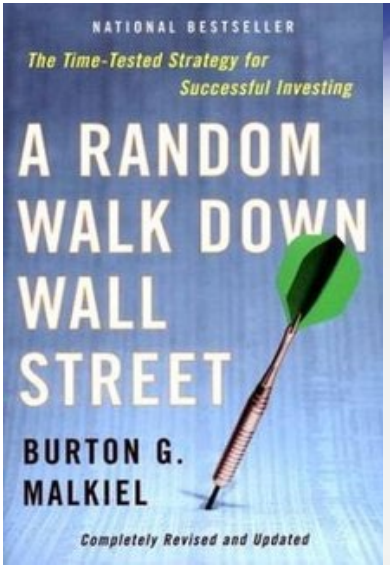
Cohn, J. B., Liu, Z., & Wardlaw, M. I., 2022. Count (and count-like) data in finance. Journal of Financial Economics, 146 (2), 529–551.

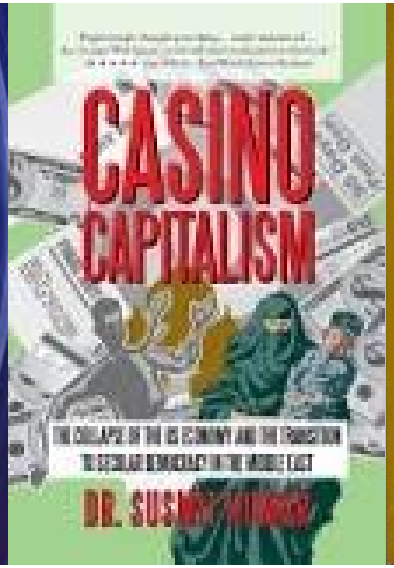
Why use an investment measure that is a count, rather than a ratio – why not e.g. $\frac{\Delta AI_{f,y(q(d))}}{AI_{f,y(q(d))}}$?

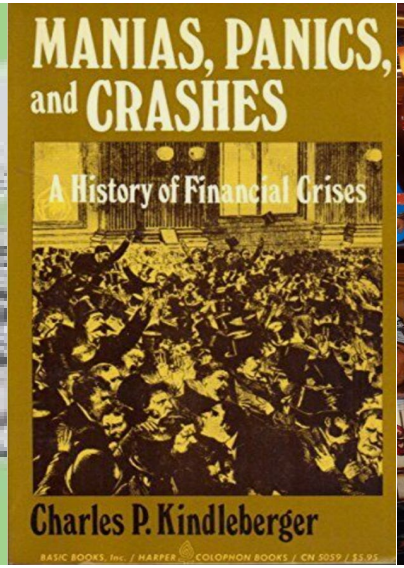
We KNOW that each [-2, +2] car <u>estimate</u> $FB_{f,d}$ has precision $= 1/\sigma^2(FB_{f,d})$
Some $FB_{f,d}$ estimates are insignificant, others are highly significant
Better econometrics might give higher weights to more precisely estimated $FB_{f,d}$
How?
Replace with Z-scores?
Estimate W.L.S regressions?

© Copyright 2024 Randall Morck, all rights reserved,

A House Divided …







Fund Managers don't beat the market	Stock returns are random walks	The stock market is an insane casinos	Manias, Panics & Crashes	Stock market is (ought to be?) a sideshow
"The past records of mutual fund managers are essentially worthless in predicting future success Burt Malkiel 1976	"The efficient markets hypothesis is the best established fact in all of social sciences." Mike Jensen 1978	"The efficient-markets hypothesis is the most remarkable error in the history of economic theory." Robert Shiller 1987	"Stock prices have reached what looks like a permanently high plateau." Irving Fischer 1929	"When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done" John Maynard Keynes 1936

© Copyright 2024 Randall Morck, all rights reserved,

Is the Stock Market a Sideshow?

Morck R, A Shleifer & RW Vishny. 1990. The Stock Market & Investment: Is the Market a Sideshow? Brookings Papers on Economic Activity 1990(2)157-215

Time series regression of real aggregate investment on market stock return & aggregate fundamentals ➔ stock market gets washed out

Table 7. Regression of Real Annual Aggregate Investment Growth on Selected Financial Variables, 1952–88

		Stock market return		*Corporate profits*		*Personal consumption*				
Equation	*Constant*	*one lag*	*two lags*	*current*	*one lag*	*current*	*one lag*	*Large equity issue*[a]	*Debt issue*[b]	R^2
7.1	0.006	0.249	0.120	. . .	. . .	. . .	. . .	. . .	. . .	0.310
		(4.95)	(2.41)							
7.2	−0.039	. . .	. . .	0.164	0.188	1.47	0.54	. . .	. . .	0.674
				(2.34)	(2.64)	(2.45)	(0.89)			
7.3	−0.026	0.105	0.070	0.158	0.207	1.18	0.03	. . .	. . .	0.747
		(2.20)	(1.36)	(2.21)	(3.06)	(2.03)	(0.04)			
7.4	−0.061	. . .	. . .	0.180	0.195	1.38	0.52	0.154	. . .	0.700
				(2.62)	(2.81)	(2.35)	(0.89)	(1.63)		
7.5	−0.045	0.099	0.066	0.171	0.212	1.12	0.05	0.125	. . .	0.764
		(2.12)	(1.29)	(2.42)	(3.18)	(1.96)	(0.08)	(1.44)		
7.6	−0.021	. . .	. . .	0.124	0.148	1.56	0.91	. . .	−0.365	0.712
				(1.77)	(2.09)	(2.71)	(1.51)		(2.03)	
7.7	−0.015	0.097	0.055	0.125	0.179	1.25	0.39	. . .	−0.262	0.765
		(2.06)	(1.06)	(1.70)	(2.59)	(2.19)	(0.61)		(1.51)	
7.8	−0.049	. . .	. . .	0.133	0.142	1.45	1.05	0.242	−0.521	0.769
				(2.09)	(2.20)	(2.77)	(1.90)	(2.72)	(3.00)	
7.9	−0.039	0.083	0.038	0.128	0.170	1.20	0.64	0.203	−0.415	0.803
		(1.88)	(0.788)	(1.86)	(2.65)	(2.25)	(1.04)	(2.33)	(2.38)	

Source: Authors' own calculations using Dep[illegible]t of Commerce and Federal Reserve data and the CRSP data base. The sample includes 37 observations. The numbers in parentheses are t-statistics. See table 6 for a descriptio[illegible]les. Results shown are from OLS regressions, except for equation 7.1, which shows the Yule Walker regression results with up to three lags, since autocorrelation in the [illegible]ant at the 5 percent confidence level in that equation. OLS R^2 is reported for all equations.

a. The equity issue variable is la[illegible]eous variable was dropped because it consistently received t-ratios below 1.

b. The debt issue variable is the ratio of [illegible] from corporate bonds to total outstanding liabilities. Only contemporaneous effects are shown here.

TOO SMALL

© Copyright 2024 Randall Morck, all rights reserved,

Is the Stock Market a Sideshow?

Morck R, A Shleifer & R Vishny. 1990. The Stock Market & Investment: Is the Market a Sideshow? Brookings Papers on Economic Activity 1990(2)157-215

Pre-clustering econometrics: Panel regressions using less entirely independent data need to show more seriously higher t-states to be taken seriously

Time series regression of real firm investment on CAPM abnormal return & firm fundamentals ➔ the stock market gets washed out

Table 2. Regressions of Growth in Real Investment on Selected Financial Variables, Firm-Level Data over Three-Year Spans, 1960–87

	Independent variables					
Equation	*Alpha*	*Cash flow growth*	*Sales growth*	*New share dummy*	*New debt dummy*	R^2
2.1	0.525	. . .	. . .	. . .	. . .	0.157
	(32.7)					
2.2	. . .	0.182	0.851	. . .	. . .	0.208
		(12.0)	(27.9)			
2.3	0.331	0.126	0.707	. . .	. . .	0.246
	(20.1)	(8.4)	(23.1)			
2.4	. . .	0.190	0.725	0.155	0.350	0.224
		(12.7)	(22.7)	(4.3)	(11.8)	
2.5	0.323	0.136	0.594	0.123	0.333	0.260
	(19.7)	(9.1)	(18.7)	(3.5)	(11.5)	
2.6	0.328	0.125	0.686	0.133	. . .	0.248
	(19.9)	(8.3)	(22.1)	(3.7)		
2.7	0.325	0.138	0.613	. . .	0.336	0.259
	(19.9)	(9.2)	(19.5)		(11.6)	

Source: Authors' own calculations using COMPUSTAT and CRSP data bases with 7,950 observations from 1963–87. See table 1 for an explanation of variables. The numbers in parentheses are *t*-statistics.

NOT SERIOUSLY ENOUGH HIGHER

© Copyright 2024 Randall Morck, all rights reserved,

Is Stock Market Efficiency True? (True-ish?)

Evidence market is efficient

Fama EF, L Fisher, MC Jensen & R Roll. 1969. The adjustment of stock prices to new information. International Economic Review 10(1)1

- ❑ Event studies "work". Individual stocks rise & fall in sensible ways as relevant information arises

Corrado, CJ. 2011. Event studies: A methodology review. Accounting & Finance 51(1)207-34.
Ding, L., Lam, H. K., Cheng, T. C. E., & Zhou, H. 2018. A review of short-term event studies in operations & supply chain management. International Journal of Production Economics 200:329-342.
Doron K & G Gurevich. 2014. Event Studies for Financial Research: A Comprehensive Guide, Palgrave Macmillan
El Ghoul, S, O Guedhami, S A. Mansi & O Sy. 2022. Event studies in international finance research. JIBS 1-21
Johnston, M A. 2007. A review of the application of event studies in marketing. Academy of Marketing Science Review

- ❑ Event studies are now standard research methodology in many other fields

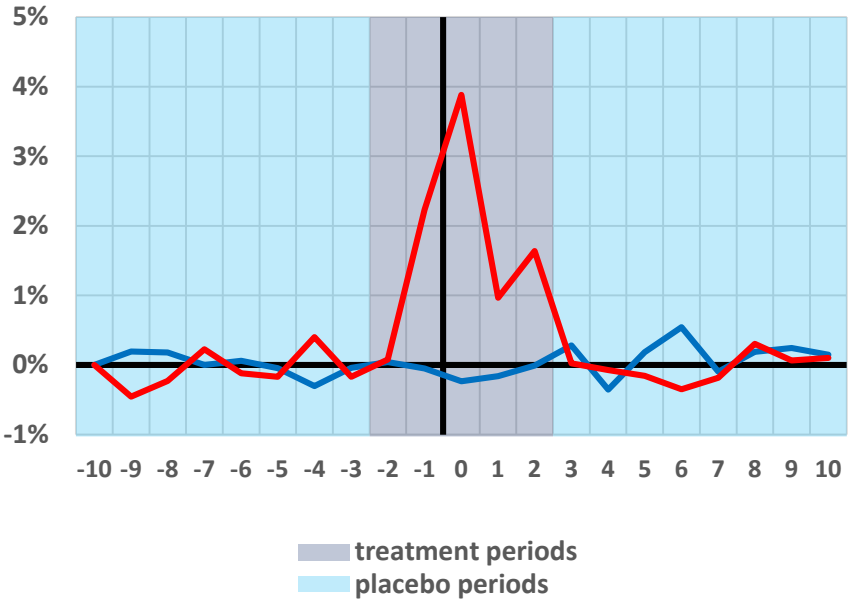
McLean, R. David & Jeffrey Pontiff. 2016. Does academic research destroy stock return predictability? Journal of Finance 7191) 5-32.

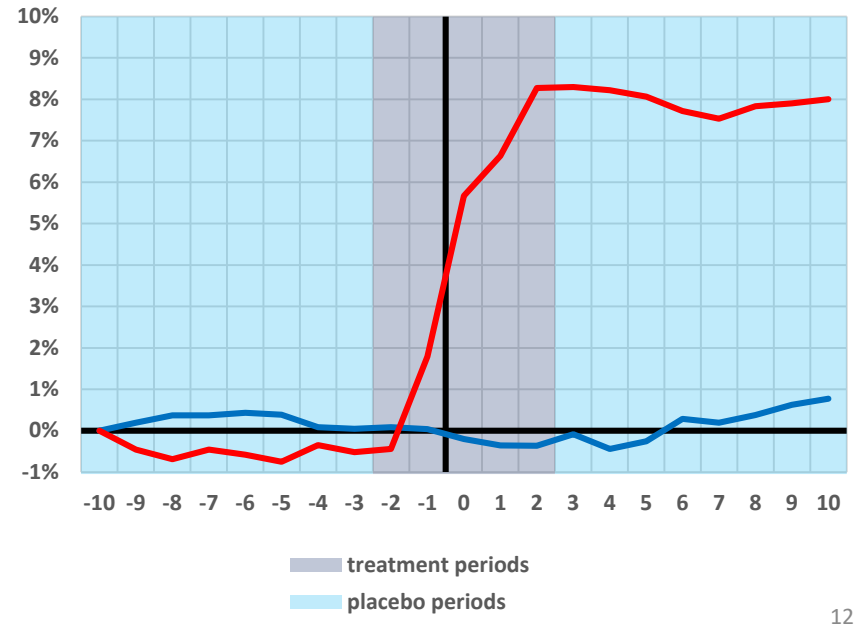
- ❑ Anomalies evaporate

Roll R. 1984. Orange juice & weather. American Economic Review 74(5)861-80
Roll R. 1988. R2. Journal of Finance 42(1)541–66.
Cutler, DM, JM. Poterba & LH Summers. 1989. What moves stock prices? Journal of Portfolio Management 15.3 4-12
Brogaard J, TH Nguyen, TJ Putnins & E Wu . 2022. What moves stock prices? The roles of news, noise, and information. Review of Financial Studies 35(9):4341-86

- ❑ When stocks move, there is unusual news
- ❑ Idiosyncratic stock return variation seems to be information driven

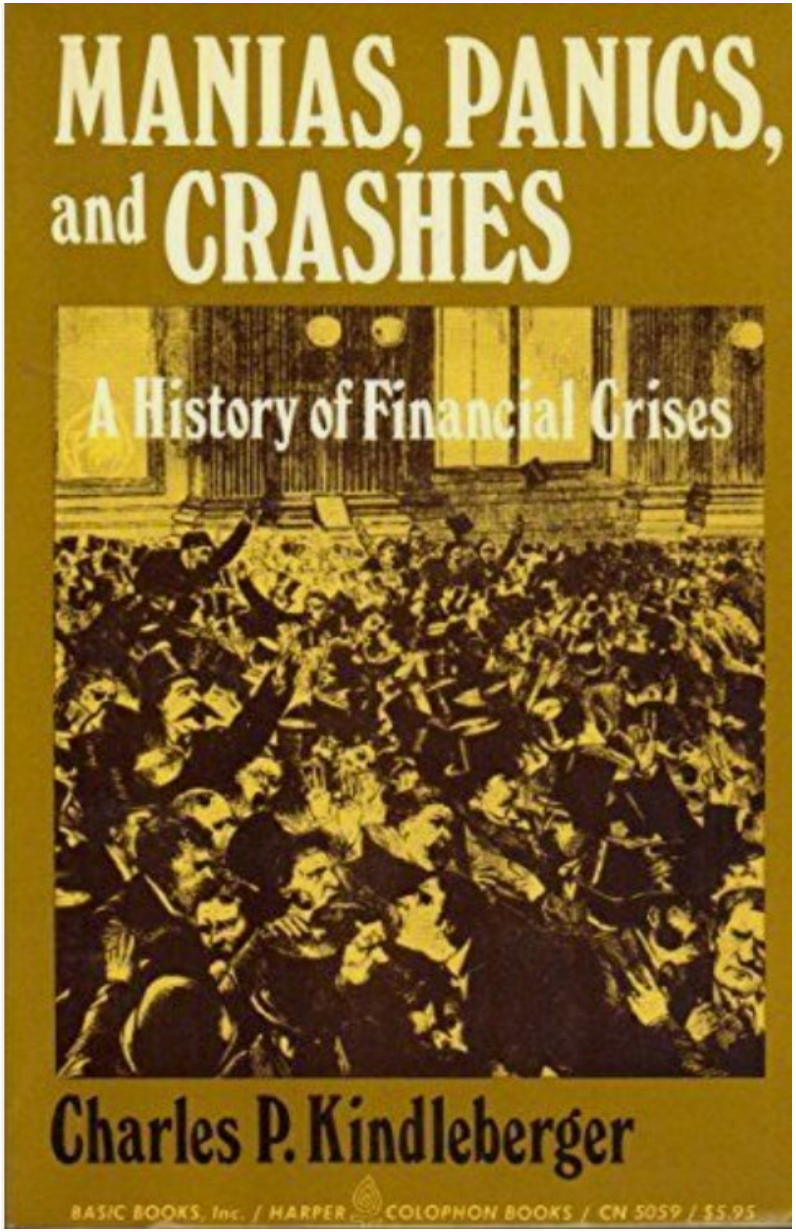
Event studies mostly work





© Copyright 2024 Randall Morck, all rights reserved,

Is Stock Market Efficiency True? (True-ish?)



Evidence market is inefficient

Minsky, HP. 1969. Private sector asset management and the effectiveness of monetary policy: theory and practice. Journal of Finance 24.2 222-37
Strange, S. 1986. Casino Capitalism. Basil Blackwell
Kindleberger C P. 1978. Manias, Panics & Crashes: A History of Financial Crises Basic: NY

- ❑ **Historical manias, panics & crashes**

Shleifer, A. 1986. Do demand curves for stocks slope down? Journal of Finance 41(3)579-90.

- ❑ **Index fund demand driven price changes**

Shiller, R J. 1990. Market volatility & investor behavior. American Economic Review 80.2 58-62.
Shiller, R. 1981. The Use of Volatility Measures in Assessing Market Efficiency. Journal of Finance 36.2 291-304.
Shiller, R J. 1989. Comovements in stock prices and comovements in dividends. Journal of Finance 44.3 719-29

- ❑ **Variance bounds tests on market indexes,**
- ❑ **CAPE index predicts long-run index returns**

Boyer BH. 2011. Style-related comovement: Fundamentals or labels? Journal of Finance 66(1)307-32
Lamont, O A. & J C. Stein. 2006. Investor sentiment & corporate finance: Micro & macro. American Economic Review 96.2 147-151.
Lee, C MC, A Shleifer & R H. Thaler. 1991. Investor sentiment & the closed-end fund puzzle. Journal of Finance 46(1)75-109.
Kumar, A & CMC Lee. 2006. Retail investor sentiment and return comovements. Journal of Finance 61.5 2451-86.

- ❑ **CEF discounts & other "sentiment" indexes arise as systematic risk factors**

De Long JB, Shleifer A, Summers LH, Waldmann RJ. Noise trader risk in financial markets. Journal of political Economy;98(4):703-38.

- ❑ **Noise traders increase systematic risk**

© Copyright 2024 Randall Morck, all rights reserved,

Is Stock Market Efficiency True? (True-ish?)

Evidence market is efficient

Fama EF, L Fisher, MC Jensen & R Roll. 1969. The adjustment of stock prices to new information. International Economic Review 10(1)1

- ❑ Event studies "work". Individual stocks rise & fall in sensible ways as relevant information arises

Corrado, CJ. 2011. Event studies: A methodology review. Accounting & Finance 51(1)207-34.
Ding, L., Lam, H. K., Cheng, T. C. E., & Zhou, H. 2018. A review of short-term event studies in operations & supply chain management. International Journal of Production Economics 200:329-342.
Doron K & G Gurevich. 2014. Event Studies for Financial Research: A Comprehensive Guide, Palgrave Macmillan
El Ghoul, S, O Guedhami, S A. Mansi & O Sy. 2022. Event studies in international finance research. JIBS 1-21
Johnston, M A. 2007. A review of the application of event studies in marketing. Academy of Marketing Science Review

- ❑ Event studies are now standard research methodology in many other fields

McLean, R. David & Jeffrey Pontiff. 2016. Does academic research destroy stock return predictability? Journal of Finance 7191) 5-32.

- ❑ Anomalies evaporate

Roll R. 1984. Orange juice & weather. American Economic Review 74(5)861-80
Roll R. 1988. R2. Journal of Finance 42(1)541–66.
Cutler, DM, JM. Poterba & LH Summers. 1989. What moves stock prices? Journal of Portfolio Management 15.3 4-12
Brogaard J, TH Nguyen, TJ Putnins & E Wu . 2022. What moves stock prices? The roles of news, noise, and information. Review of Financial Studies 35(9):4341-86

- ❑ When stocks move, there is unusual news
- ❑ Idiosyncratic stock return variation seems to be information driven

Evidence market is inefficient

Minsky, HP. 1969. Private sector asset management and the effectiveness of monetary policy: theory and practice. Journal of Finance 24.2 222-37
Strange, S. 1986. Casino Capitalism. Basil Blackwell
Kindleberger C P. 1978. Manias, Panics & Crashes: A History of Financial Crises Basic: NY

- ❑ Historical manias, panics & crashes

Shleifer, A. 1986. Do demand curves for stocks slope down? Journal of Finance 41(3)579-90.

- ❑ Index fund demand driven price changes

Shiller, R J. 1990. Market volatility & investor behavior. American Economic Review 80.2 58-62.
Shiller, R. 1981. The Use of Volatility Measures in Assessing Market Efficiency. Journal of Finance 36.2 291-304.
Shiller, R J. 1989. Comovements in stock prices and comovements in dividends. Journal of Finance 44.3 719-29

- ❑ Variance bounds tests on market indexes,
- ❑ CAPE index predicts long-run index returns

Boyer BH. 2011. Style-related comovement: Fundamentals or labels? Journal of Finance 66(1)307-32
Lamont, O A. & J C. Stein. 2006. Investor sentiment & corporate finance: Micro & macro. American Economic Review 96.2 147-151.
Lee, C MC, A Shleifer & R H. Thaler. 1991. Investor sentiment & the closed-end fund puzzle. Journal of Finance 46(1)75-109.
Kumar, A & CMC Lee. 2006. Retail investor sentiment and return comovements. Journal of Finance 61.5 2451-86.

- ❑ CEF discounts & other "sentiment" indexes arise as systematic risk factors

De Long JB, Shleifer A, Summers LH, Waldmann RJ. Noise trader risk in financial markets. Journal of political Economy;98(4):703-38.

- ❑ Noise traders increase systematic risk

Microeconomic
Macroeconomic

© Copyright 2024 Randall Morck, all rights reserved,

Synthesis: Samuelson's Dictum

"The stock market seems efficient at the micro-level and inefficient at the macro-level"

-- Paul Samuelson

Micro & macro stock price movements really are different

Morck R, Yeung B, Yu W. 2000. The information content of stock markets: why do emerging markets have synchronous stock price movements? JFE 58(1/2)215-60

Wurgler J. 2000. Financial markets & the allocation of capital. JFE 58(1-2)187-214.

- ❑ **Idiosyncratic stock price movements correspond to information & move capital efficiently**

Campbell, John. 1991. A Variance Decomposition for Stock Returns. Economic Journal101(405)157–79

- ❑ **Market-wide returns are temporary and subject to reversal**

Vuolteenaho, Tuomo. 2002. What Drives Firm-Level Stock Returns?" Journal of Finance 57(1)233–64

- ❑ **Firm-specific returns are largely permanent**

Lamont, OA & JC Stein. 2006. Investor sentiment & corporate finance: Micro & macro. American Economic Review 96(2)147-51.

- ❑ **Market timing in corporate actions – e.g. equity issues, stock financed M&A – rises on market upswings, but not on firm-specific upswings**

Jung, J & R J. Shiller. 2005. Samuelson's dictum & the stock market. Economic Inquiry 43.2 221-228.

- ❑ **Individual stock prices do not vary too much to be explained by dividends variation**

Morck, R, B Yeung & W Yu. 2016. R^2 and the Economy. Annual Review of Financial Economics

- ❑ **Firm-specific stock returns reflect information of significance to allocative efficiency**

© Copyright 2024 Randall Morck, all rights reserved,

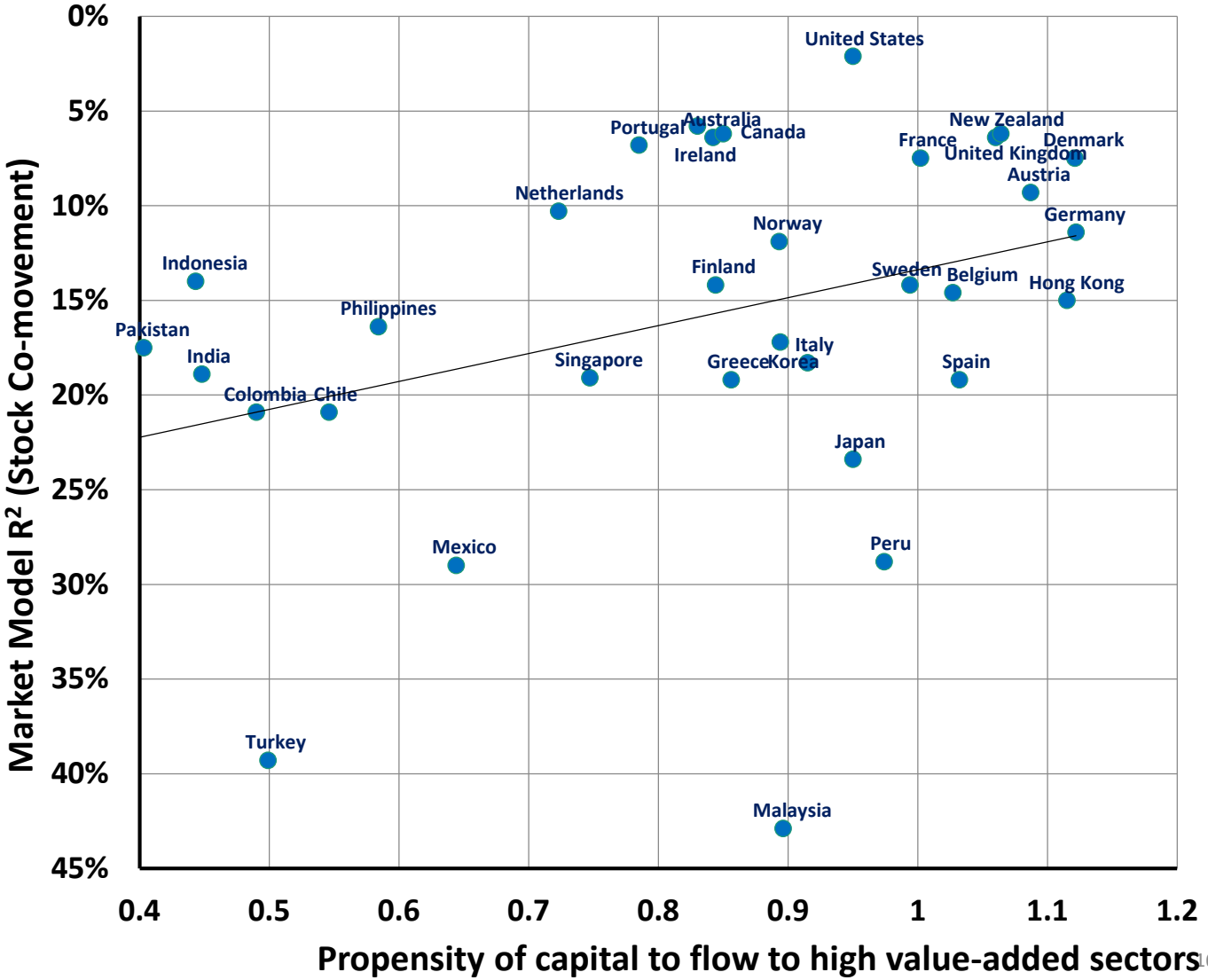
Synthesis: Samuelson's Dictum

"The stock market seems efficient at the micro-level and inefficient at the macro-level"

-- Paul Samuelson

Morck R, Yeung B, Yu W. 2000. The information content of stock markets: why do emerging markets have synchronous stock price movements? JFE 58(1/2)215-60

Wurgler J. 2000. Financial markets & the allocation of capital. JFE 58(1-2)187-214.



© Copyright 2024 Randall Morck, all rights reserved,

Positive Externalities of Information Rich Stock Prices

Tobin, J. 1984. On the Efficiency of the Financial System. Lloyds Bank Review

- ❑ Informational efficiency (price reaction to news) unimportant except arbitrageurs
- ❑ So are philosophical definitions based on fundamental or true (just?) firm value
- ❑ What matters (positive externalities) is functional efficiency: Does the stock market direct capital to its highest value uses adequately accurately (better than alternatives?)

Positive externalities arise if the stock market is "efficient enough" so

Black, Fischer. 1986. Noise. American Finance Association Presidential Address. Journal of Finance 41(3) 529-543.

- ❑ Passive savers & untalented fund managers get "reasonable enough" risk-adjusted returns

Modigliani, Franco & Merton Miller. 1959. The Cost of Capital, Corporation Finance & the Theory of Investment. American Economic Review 49(4)655–69.
Modigliani, Franco & Merton Miller. 1963. Corporate Income Taxes & the Cost of Capital: A Correction. American Economic Review 53(3)433–43
Morck R, A Shleifer & R Vishny. 1990. The stock market & investment: is the market a sideshow? Brookings Papers on Economic Activity 1990(2)157-215.
Dow, J. & Gorton, G. 1997. Stock market efficiency & economic efficiency: is there a connection? Journal of Finance 52(3)1087-29
Wurgler, J. 2000. Financial markets & the allocation of capital. Journal of Financial Economics 58(1-2)187-214.
Durnev, A, R Morck & B Yeung. 2004. Value-enhancing capital budgeting & firm-specific stock return variation. Journal of Finance 59.1 65-105.

- ❑ Market-value based WACCs leave firms doing "reasonable enough" capital budgeting Chen, Q

Goldstein I & W Jiang. 2007. Price informativeness & investment sensitivity to stock price. Review of Financial Studies 20.3.619-650.
Bakke T & T Whited. 2010. Which firms follow the market? An analysis of corporate investment decisions. Review of Financial Studies 23(5)1941-80.
Foucault, T & L Fresard. 2014. Learning from peers' stock prices & corporate investment. Journal of Financial Economics 111(3)554-77
Edmans, A., S Jayaraman & J Schneemeier. 2017. The source of information in prices & investment-price sensitivity. JFE 126(1)74-96.
Bond, P, A Edmans & I Goldstein. 2012. The real effects of financial markets. Annual Review of Financial Economics 4(1)339-60.
Cao S, I Goldstein, J He & Y Zhao. 2024. Feedback on Emerging Corporate Policies. ABFER 2024 Conference presentation, Singapore

- ❑ Stock price reactions to top manger's decisions provide "reasonable enough" feedback to help top managers correct bad decisions

© Copyright 2024 Randall Morck, all rights reserved,

Synthesis: Samuelson's Dictum

"The stock market seems efficient at the micro-level and inefficient at the macro-level"

-- Paul Samuelson

The social purpose of asset pricing models

$$r_{i,t} = r_f + \mathrm{b}_i\left(\mathrm{r}_{m,t}\right) + \varepsilon_{i,t} + \begin{Bmatrix} \alpha_i \\ \delta_{i,t}\varepsilon_{i,t} \end{Bmatrix}$$

First Wave Efficient Markets

Investor performance

- α_i = abnormal return earned by well-trained MBA money manager
- $\mathrm{b}_i\left(\mathrm{r}_{m,t}\right)$ = costs of undiversifiable risk factors x amounts of undiversifiable risk factors

Instrumental

- $\varepsilon_{\mathrm{i,t}}$ = error term that drops out because $\mathrm{E}[\varepsilon_{\mathrm{i,t}}] = 0$ Goes away

Second Wave Efficient Markets

- α_i = trading profit driven to zero if money management is competitive Goes away
- $\mathrm{b}_i\left(\mathrm{r}_{m,t}\right)$ = sensitivity to macro information & sentiment factors x Factor magnitudes

Instrumental

- $\varepsilon_{\mathrm{i,t}}$ = firm-specific information-loaded term Information

© Copyright 2024 Randall Morck, all rights reserved,

The Social Purpose of Asset Pricing Models

By lucky happenstance

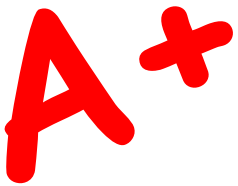
- Asset pricing models <u>designed to estimate alphas</u> (beat the market performance) by adjusting for undiversifiable risk prices and quantities <u>work passably well as ways of decomposing returns into firm-specific information</u> & macro information / sentiment components

Second Wave Efficient Markets

Which off-the-shelf asset pricing model does this best?

- Residuals from market model, zero-beta model, CAPM, CCAPM, ICAPM, APT, FF3, FF4, FF5, FF6, FF7 … real betas, fundamentals betas, beta lag structures, shrinkage betas, smart betas, full covariance matrix, …
  - The various factors can capture economy-level information and/or market sentiment, noise trader activity, diagnostic expectations momentum, mean reversion, crash risk, …?
  - The various factor loadings to more arcane risk factors can be interpreted as the stock's sensitivity to dimensions of market sentiment reflected in those factors?
- If the objective is firm-specific information incorporation into stock prices (rather than non-diversifiable risk), firm return minus mean, median, weighted mean return of other firms in the same industry might do this with more generality?
  - How to define an "industry"?

© Copyright 2024 Randall Morck, all rights reserved,



Thank you

© Copyright 2024 Randall Morck, all rights reserved,