Basic Finance:

Risk, Leverage, and Returns

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Basic Question

- More basic than factor-pricing:

  Investors should get higher expected returns for more risk.

- So, why have firms with more leverage not offered higher average rates of return? (Many papers.)

- One answer in Gomes-Schmid (2010):
  - Growth options are an omitted **endogenous** variable: Growth firms choose lower leverage.

  → Lower market-leverage firms have higher expected returns because they are actually riskier.

  - Very likely a good contributor to the phenomenon.

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QE

- Can one test classical asset-pricing with a quasi-experiment?
- What is an exogenous shock to risk (to then measure changes in average returns)?
- I need a preannounced **leverage change**!
- Leverage is leverage net of cash.
  - A firm with $100 in debt and $100 in cash has zero leverage at the moment.
  - I need this because I want to shock the firm with preannounced cash addition or removal.

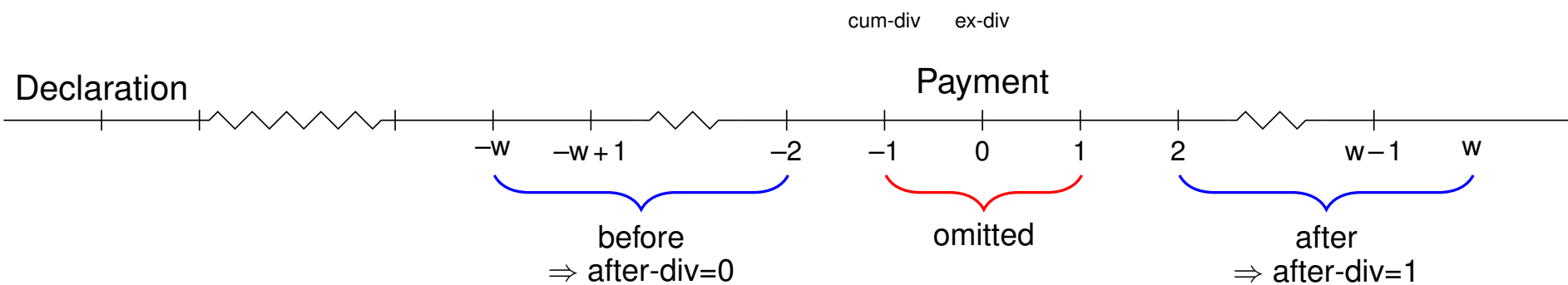
Preannounced Leverage Change

- After the announcement date (no more project news inference)
- Before the payment date, the corporate shell holds
  1. The (defeased) dividend cash; and
  2. everything else.
- After the payment date, the corporate shell holds only (2).

$\Rightarrow$ Because cash (1) is less volatile, then volatility should go up.

$\Rightarrow$ If cash (1) is safer, then expected return should go up.

Dividend Announced In The Solid Past. Pre-payment vs. Post-payment.



More Intuition

- Risk-free rate of zero. Underlying "factory" is holding the market index.
- Market can go to \$0.50 or \$1.50. (–50% or +50%)
- Fund has \$1 holdings, currently all in stock.
- Declare a dividend of \$0.25. (WLOG, assume no default risk.)

  ## Keep Money in Index to Payment

  - Still pay \$0.25 in dividends.
  - If up, firm is worth \$1.25. If down, firm is worth \$0.25.
  - Post-Div, \$0.75 will become \$0.25 or \$1.25 (–67% or +67%)

  More levered.

  If cash+equity were quoted the day after, the risk would still be +50%,–50%.

  ## Convert to Cash Now

  - Day before: we quote return on cash plus factory.
  - Day after: we quote return on factory only.

  More levered.

- View differently: The firm is committed to \$0.25 in cash and \$0.75 in index holding. Together with the investor's pant pockets, there is no change in net risk from before to after payment.

QE Shock Design

Proven in the paper:

- Pre-leverage or cash or ... is irrelevant. ("Sufficient Statistic")
- Pre-payment cash, leverage, etc., is summarized by pre-payment levered return moments.
- This is regardless of whether the firm holds the payout as cash from announcement to payment, or simply levers up at payment, or ...
- Quantitative prediction, Quantitative Findings

$$
\begin{aligned}
\text{Equity}_{\text{pre}} &= \text{Equity}_{\text{Equity-Other}} + (\text{Equity}_{\text{Risk-free}} = \text{Dividend}) , \\
\tilde{R}_{\text{pre}} &= (1-\delta) \cdot \tilde{R}_{\text{Equity-Other}} + \delta \cdot R_{\text{Risk-free}} , \\
\text{Equity}_{\text{post}} &= \text{Equity}_{\text{Equity-Other}} , \\
\tilde{R}_{\text{post}} &= \tilde{R}_{\text{Equity-Other}} ,
\end{aligned}
$$

$$
\sigma(\tilde{R}_{\text{post}}) = \left(\frac{1}{1-\delta} \right) \cdot \sigma(\tilde{R}_{\text{pre}}) .
$$

$$
E(\tilde{R}_{\text{post}}) = \left(\frac{1}{1-\delta} \right) \cdot E(\tilde{R}_{\text{pre}}) - \left(\frac{\delta}{1-\delta} \right) \cdot R_{\text{Risk-free}} ,
$$

- With high daily variance $\sigma \approx 1\%$ (or beta), prediction is clear positive.
- With low daily expected stock returns ER $\approx$ 1bp, prediction is non-negative, but close to zero.

Tests

Descriptive Statistics:

- About 200,000 ordinary cash dividend observations, 1962-2014
- Typical payout: 0.8% of equity.
- Typical stock return mean/day: 6 bp/day . (–1 ewretd)
- Typical volatility: 1.4% /day.

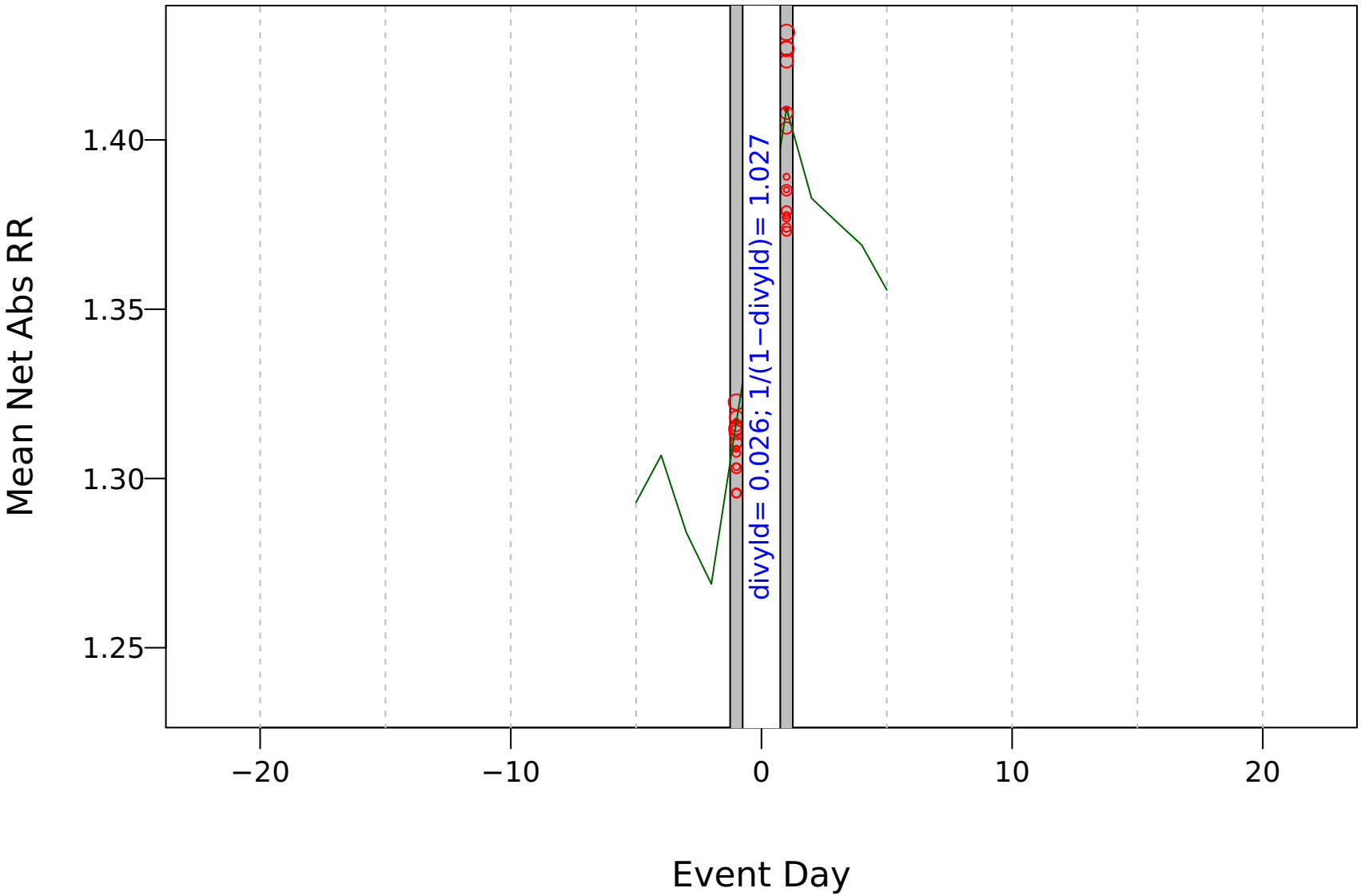
Rough Estimates:

$\Rightarrow$ σ should go from 1.40%/day to 1.41%/day.

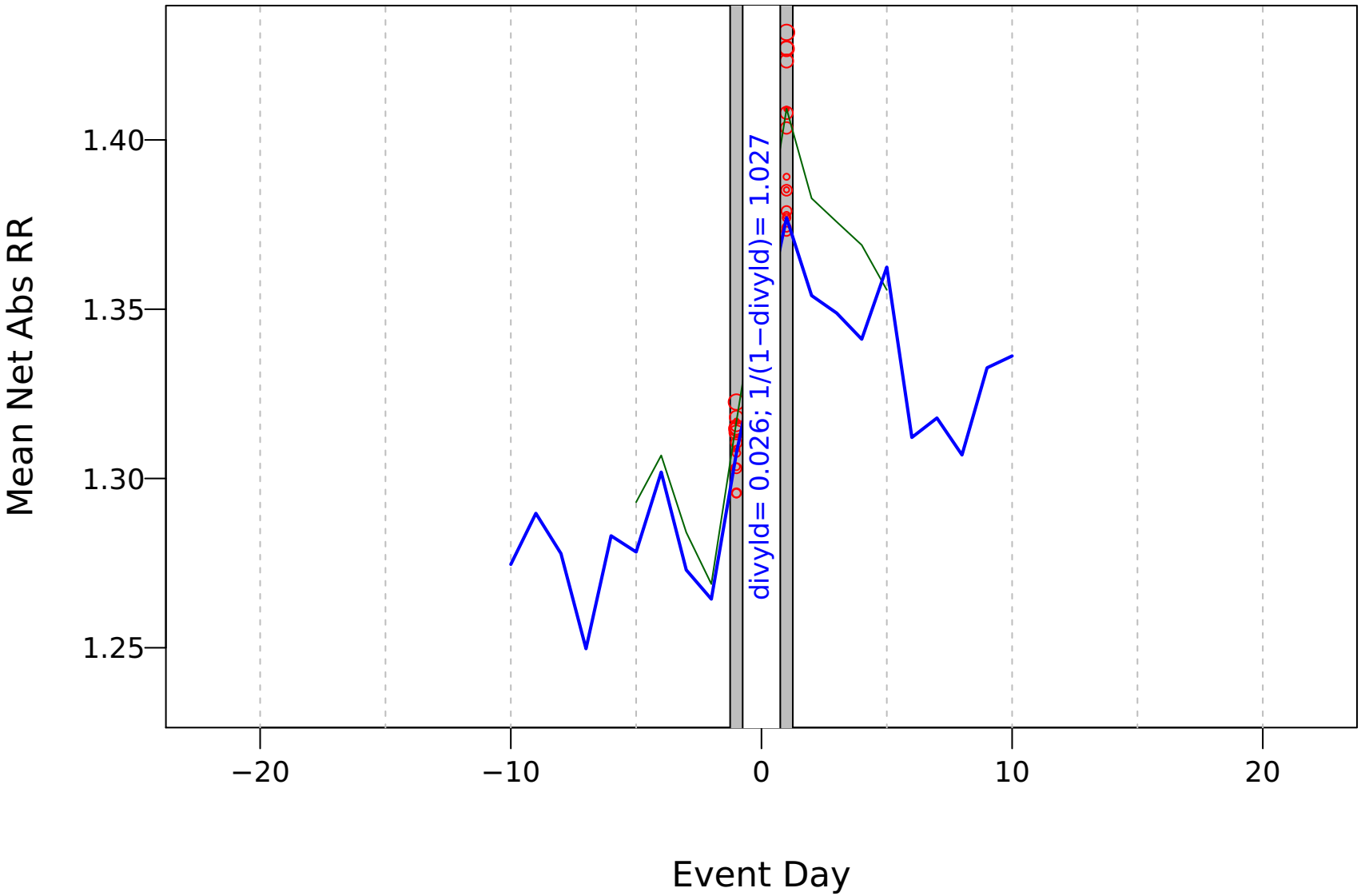
$\Rightarrow$ ER should go from 6bp to 6.01bp.

Volatility Prediction

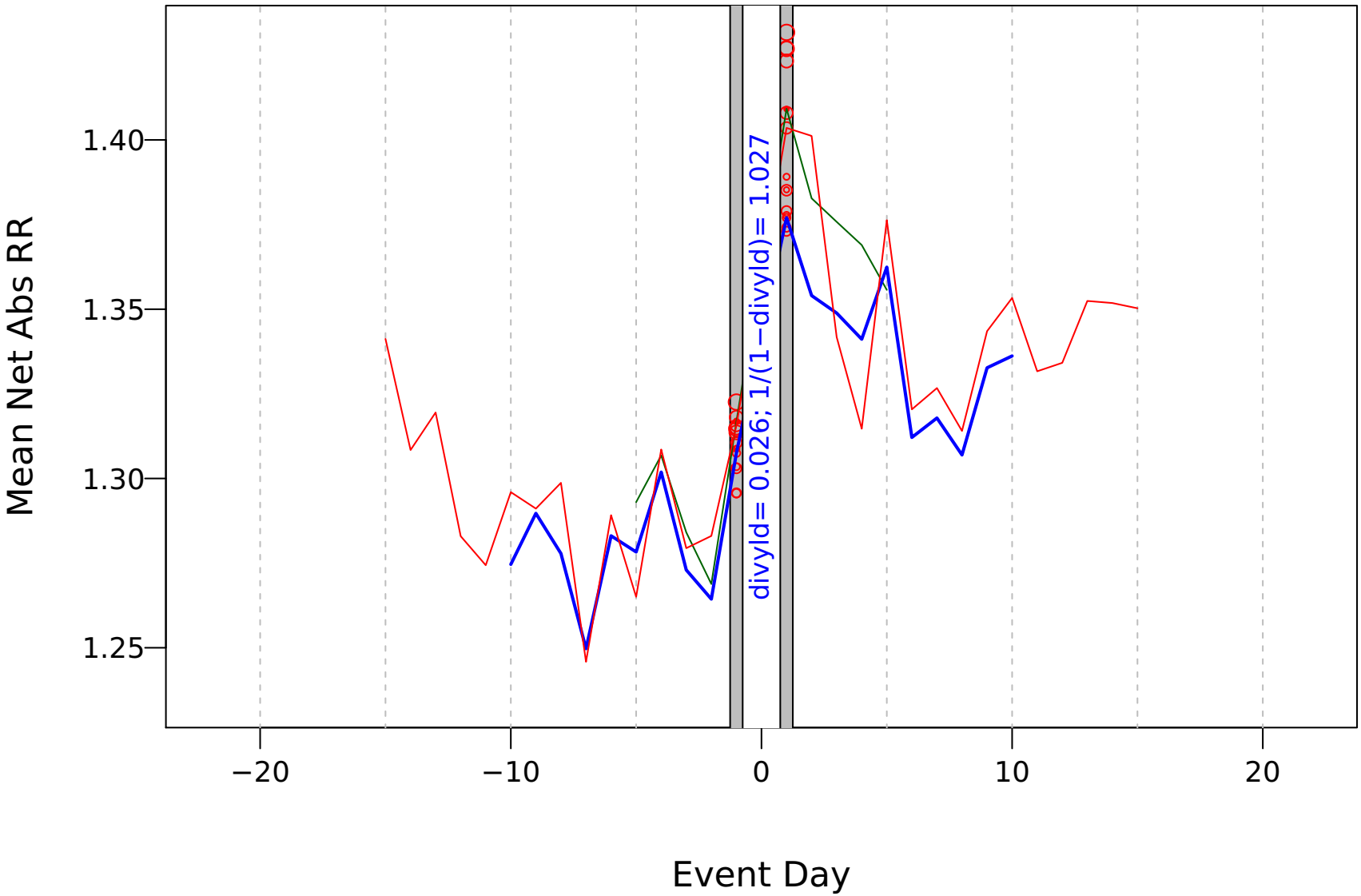
Volatility Prediction, $\delta > 2\%$: 5 Day



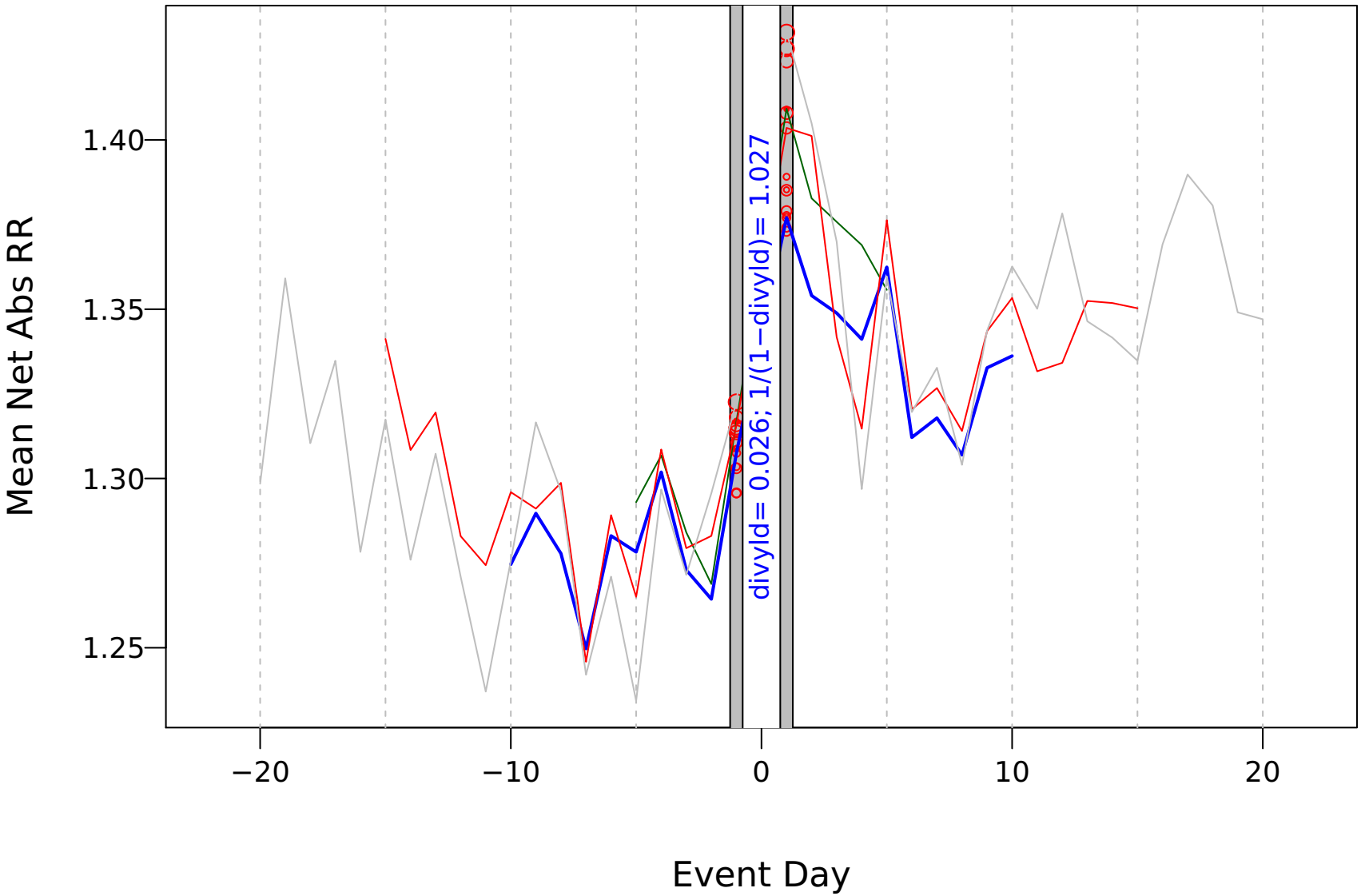
Volatility Prediction, $\delta > 2\%$: 10 Day



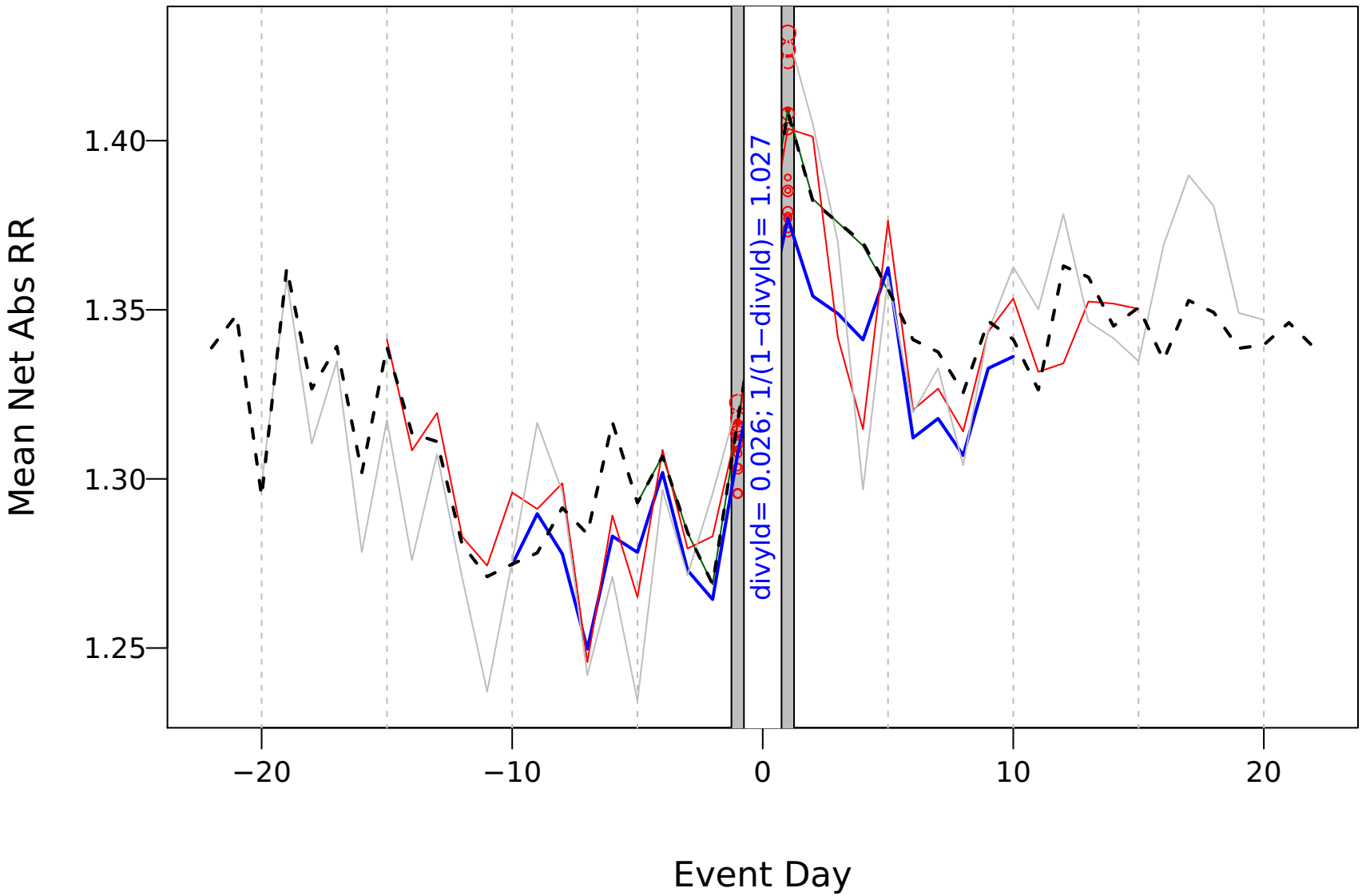
Volatility Prediction, $\delta > 2\%$: 15 Day



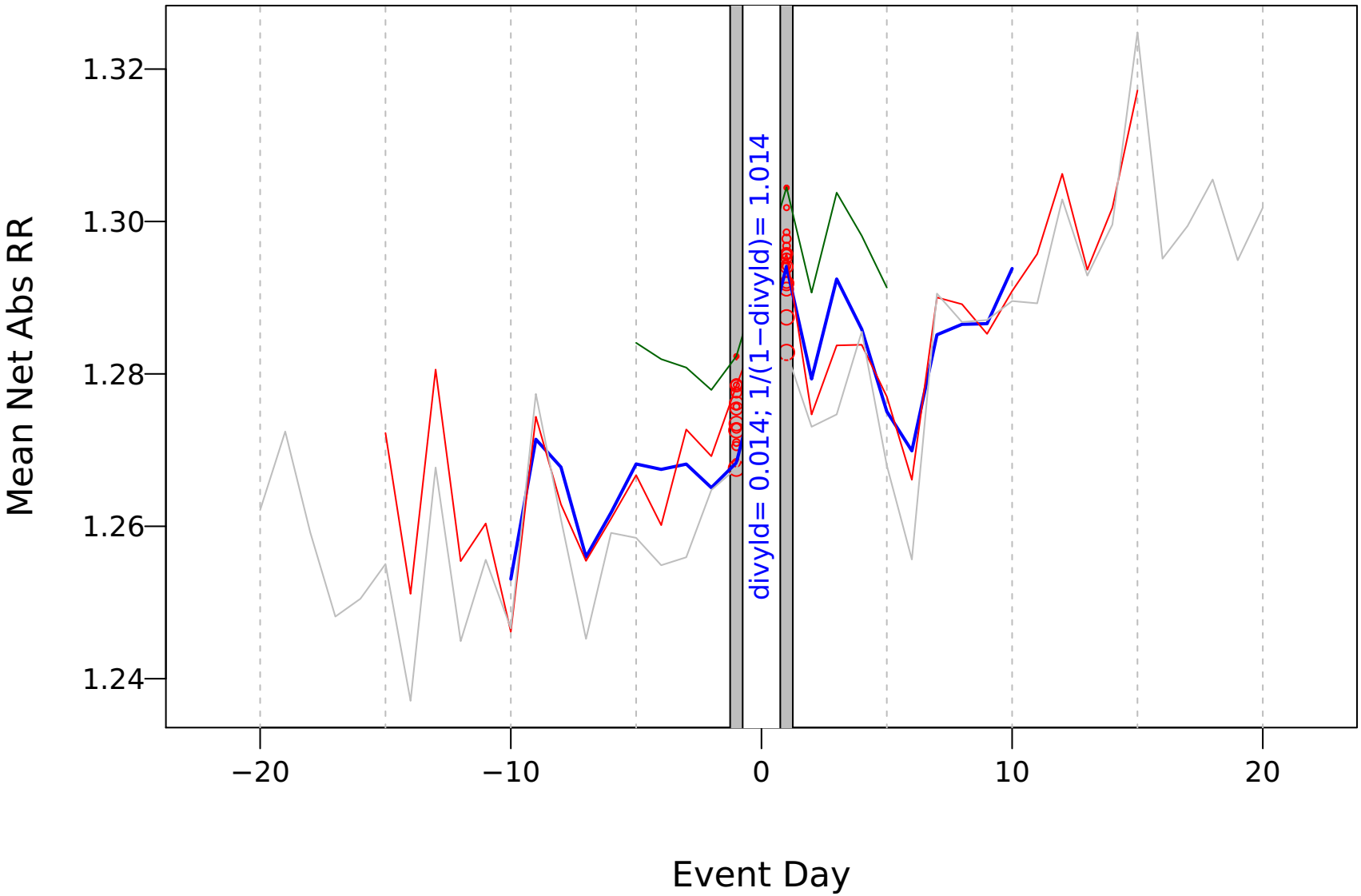
Volatility Prediction, $\delta > 2\%$: 20 Day



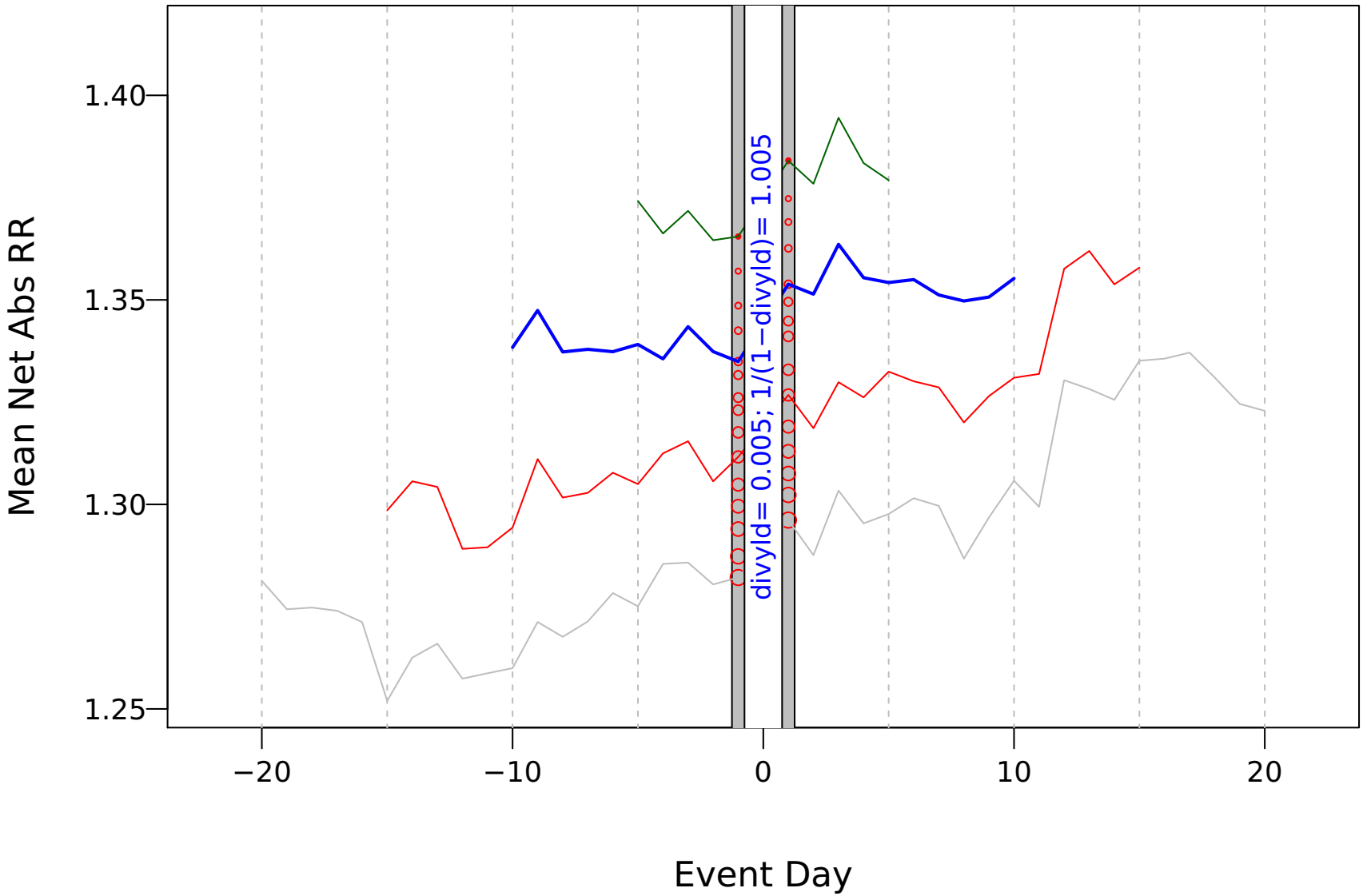
Volatility Prediction, $\delta > 2\%$: Use Changing Composition Use All



Volatility Prediction, $1\% < \delta < 2\%$

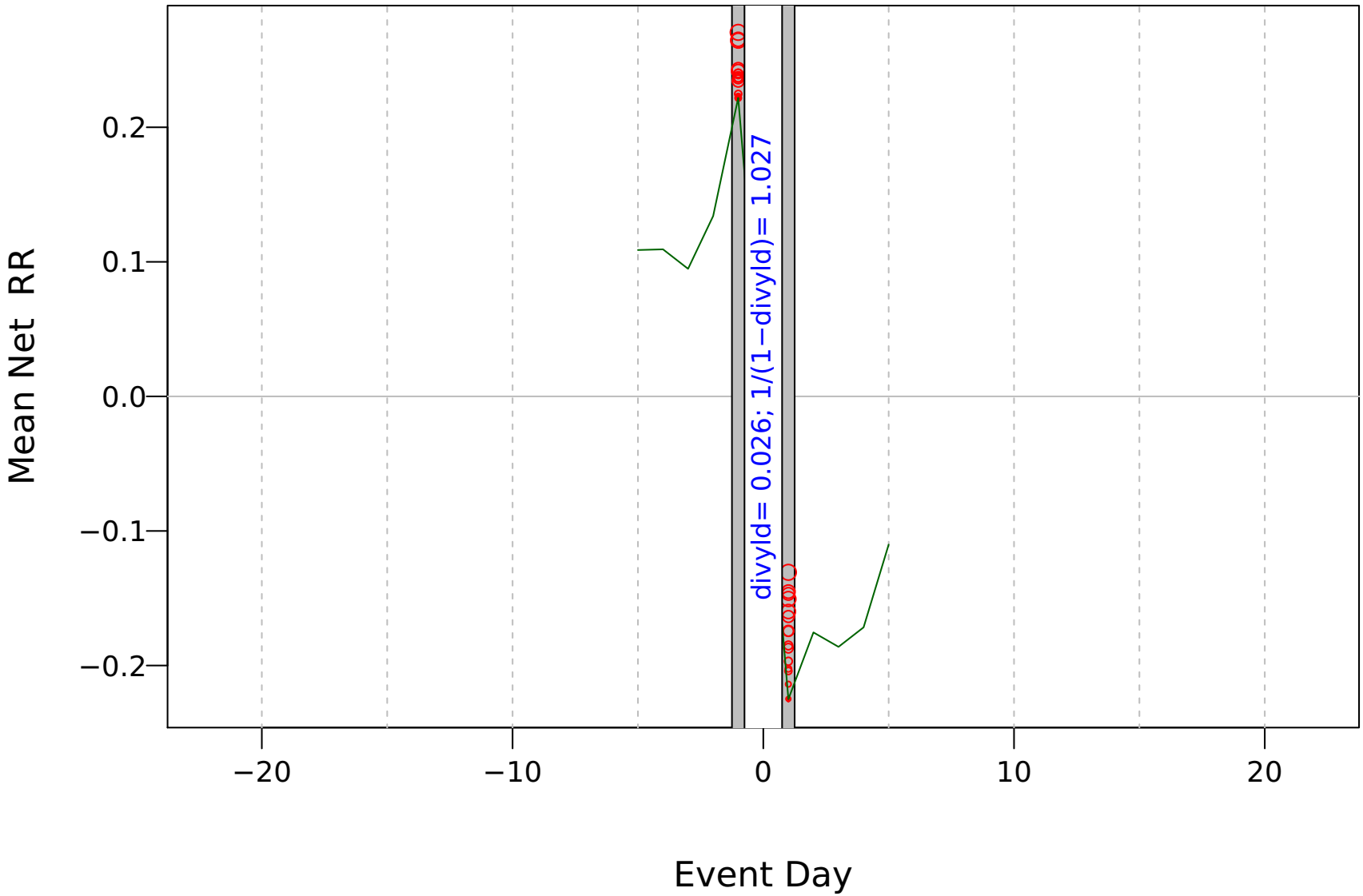


Volatility Prediction, $\delta < 1\%$



Means Prediction

Means Prediction, $\delta > 2\%$: 5 Day



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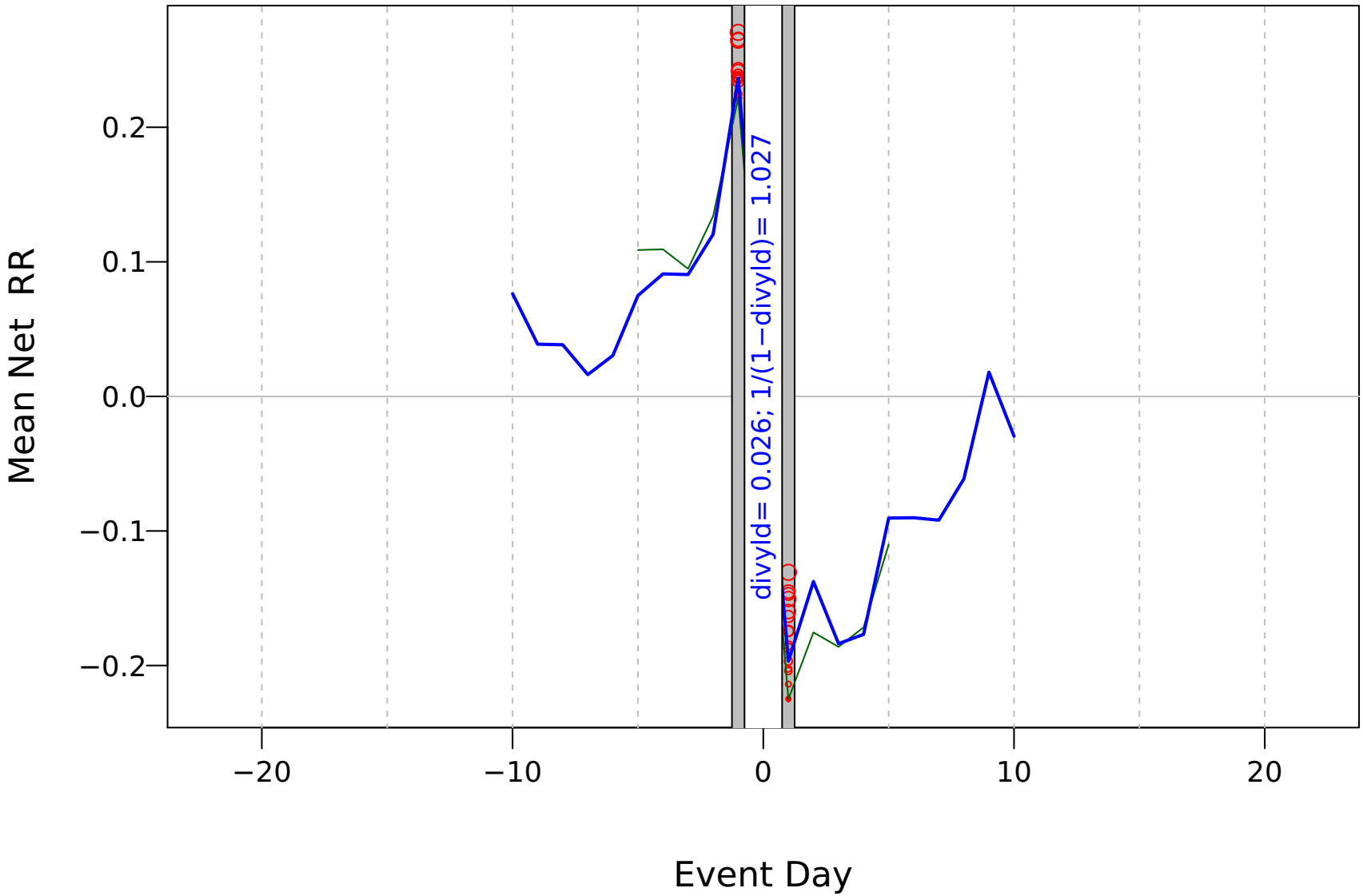

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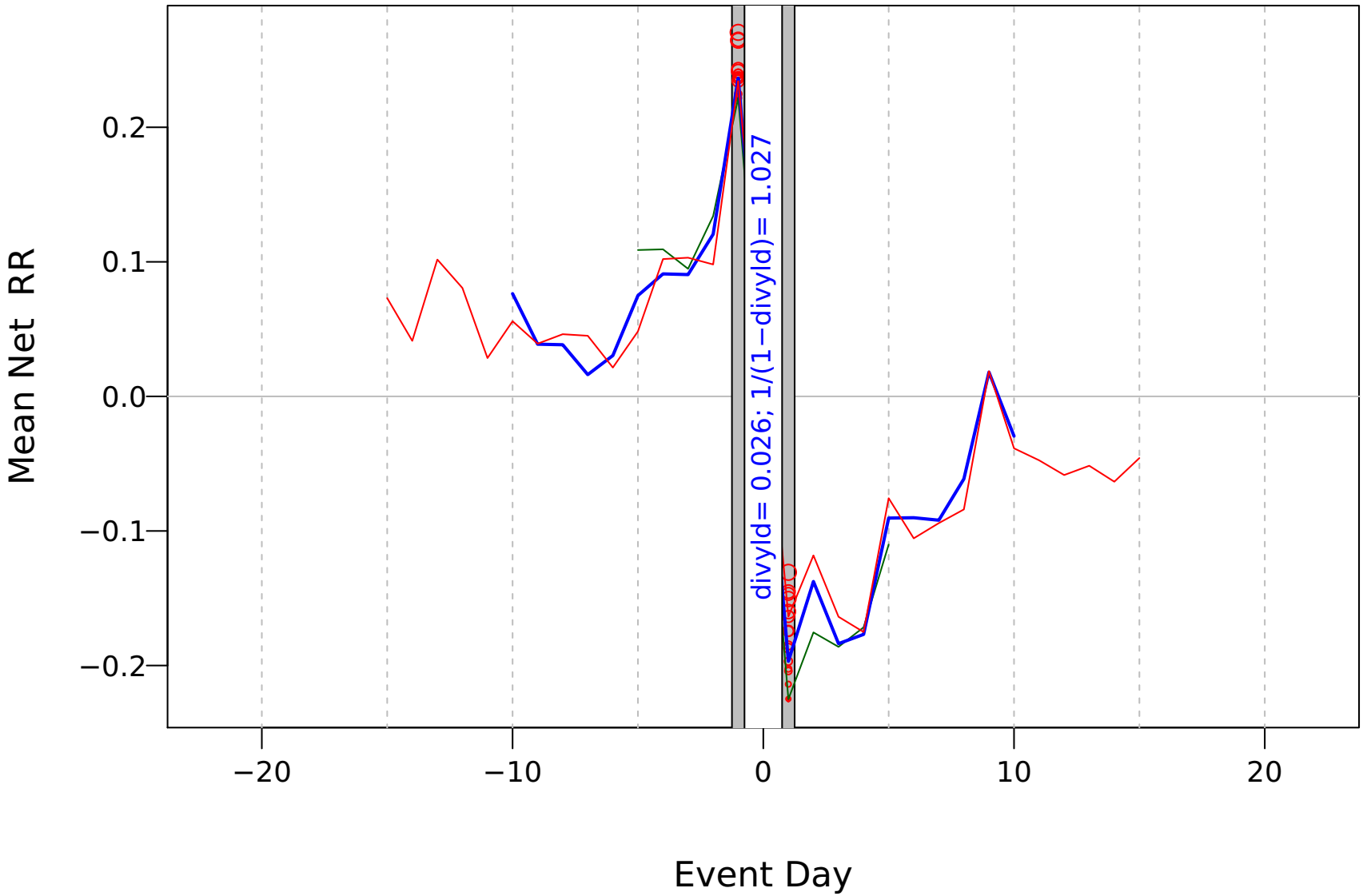

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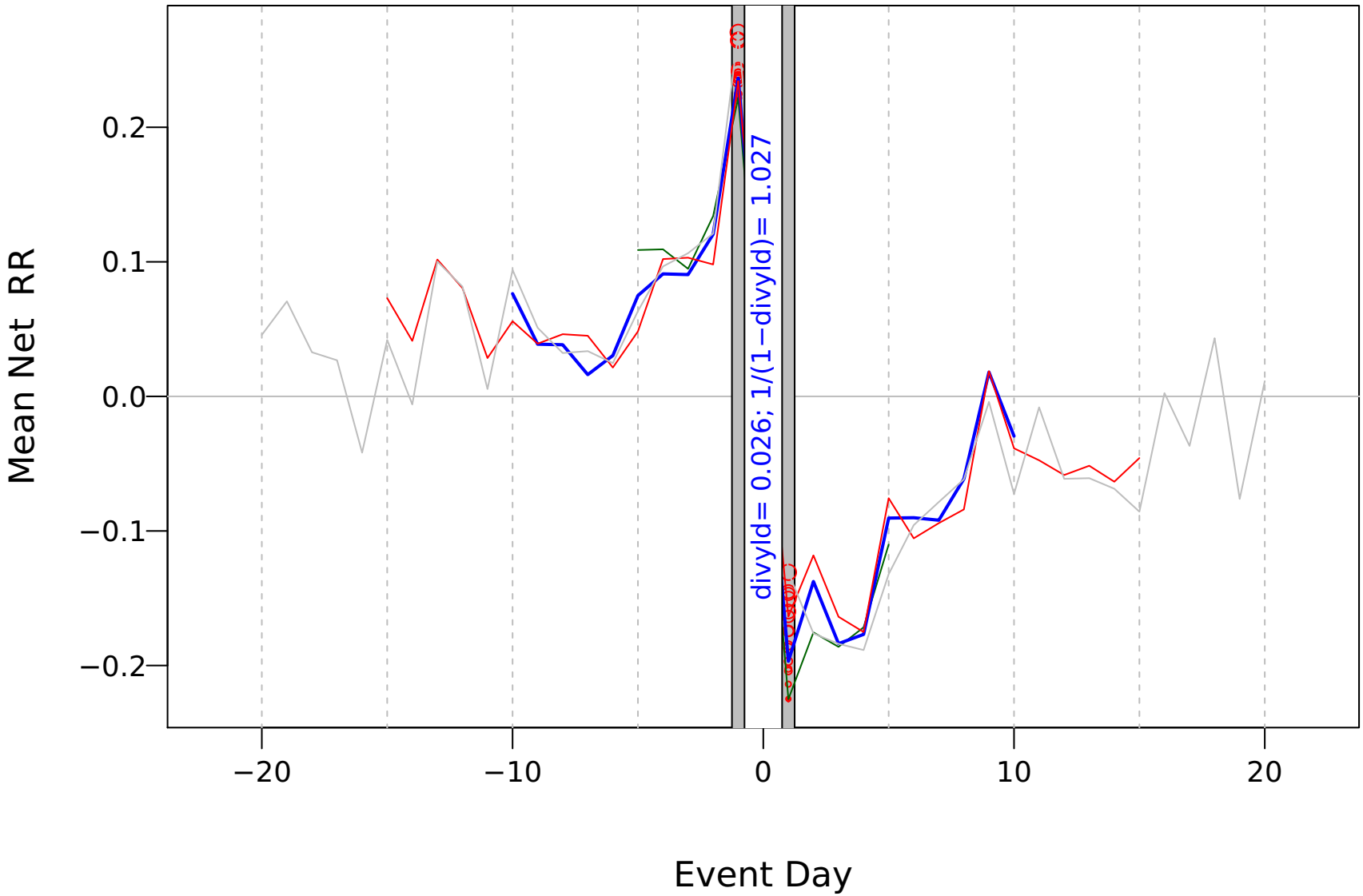

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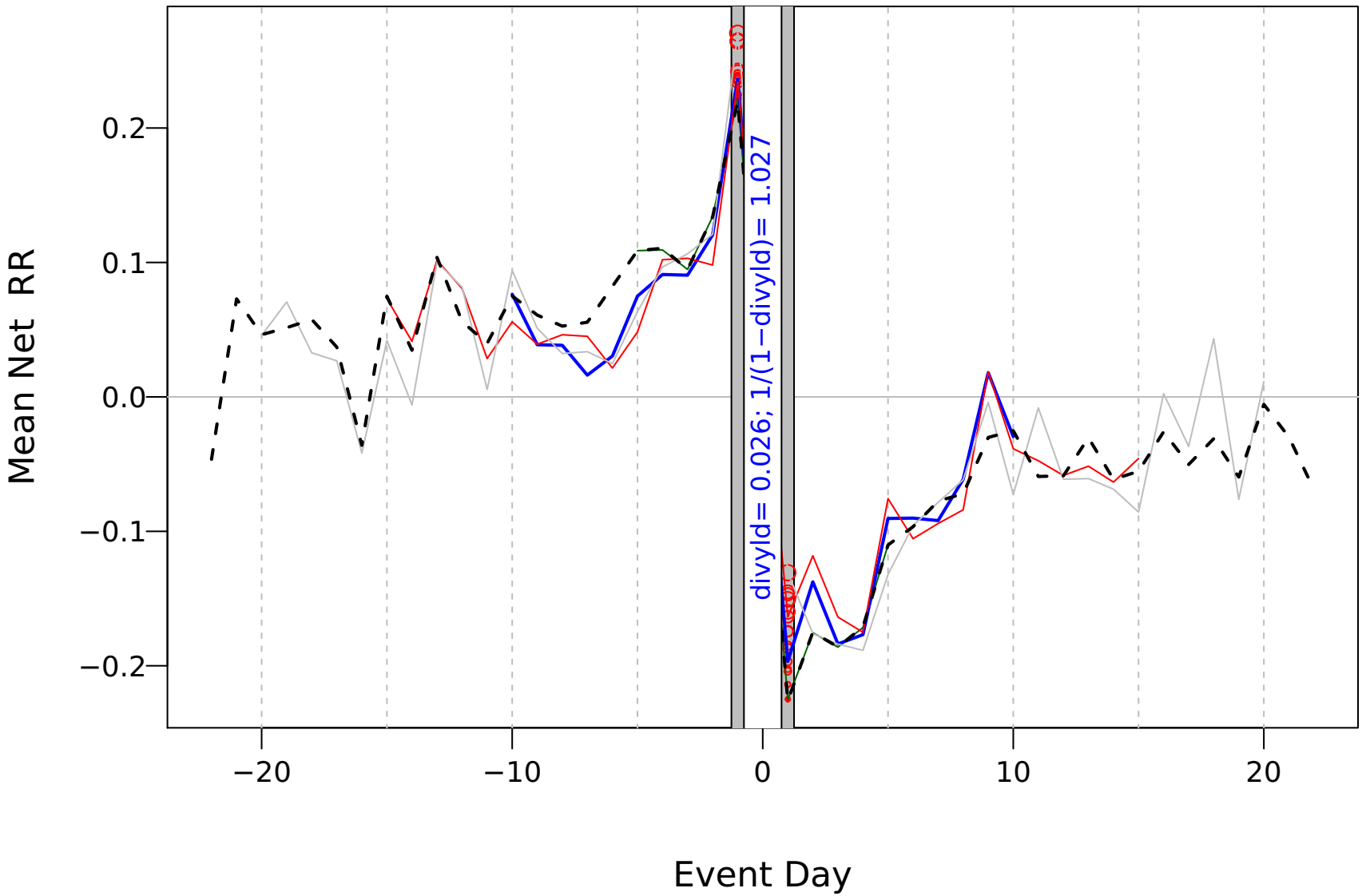
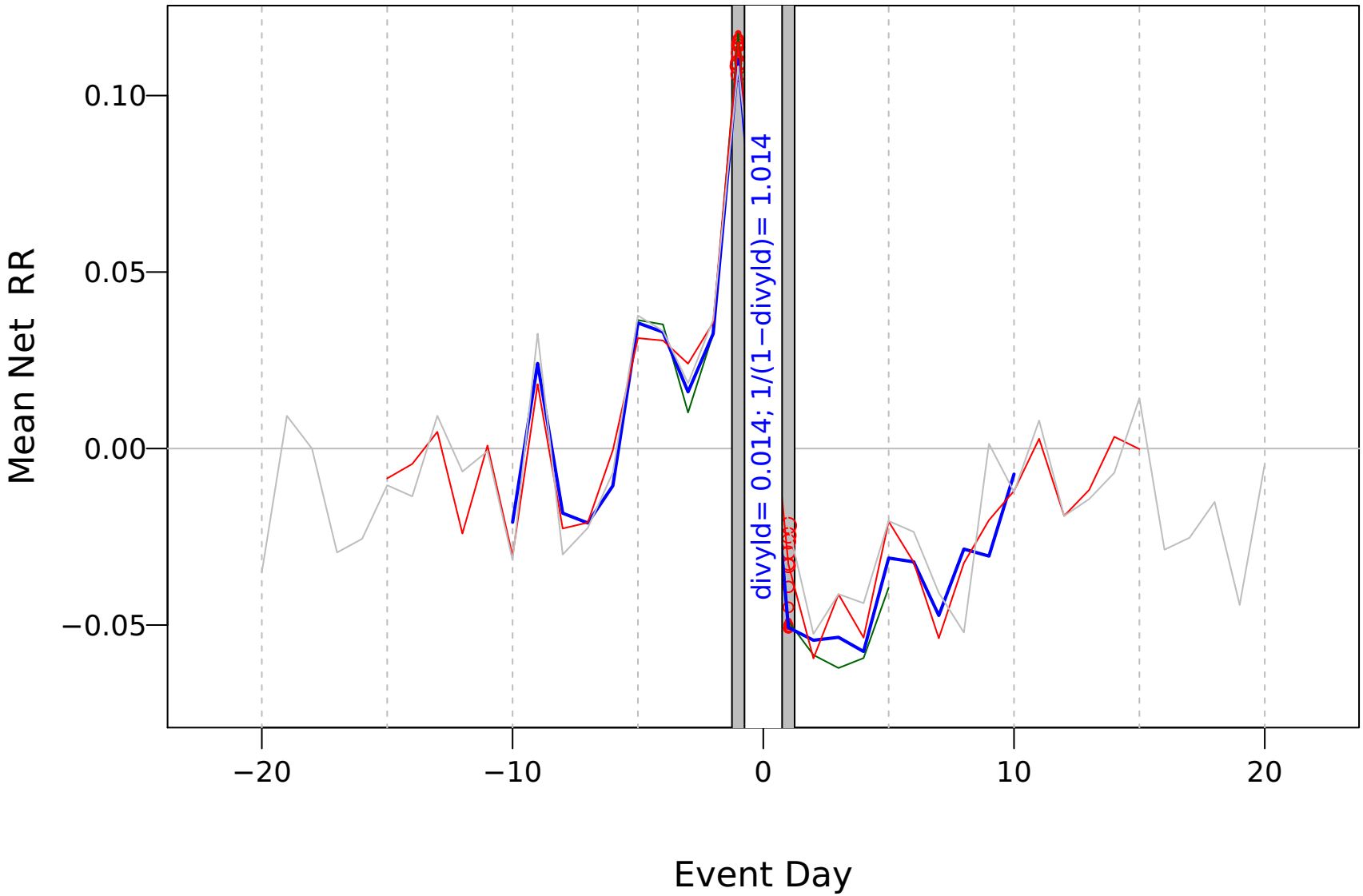
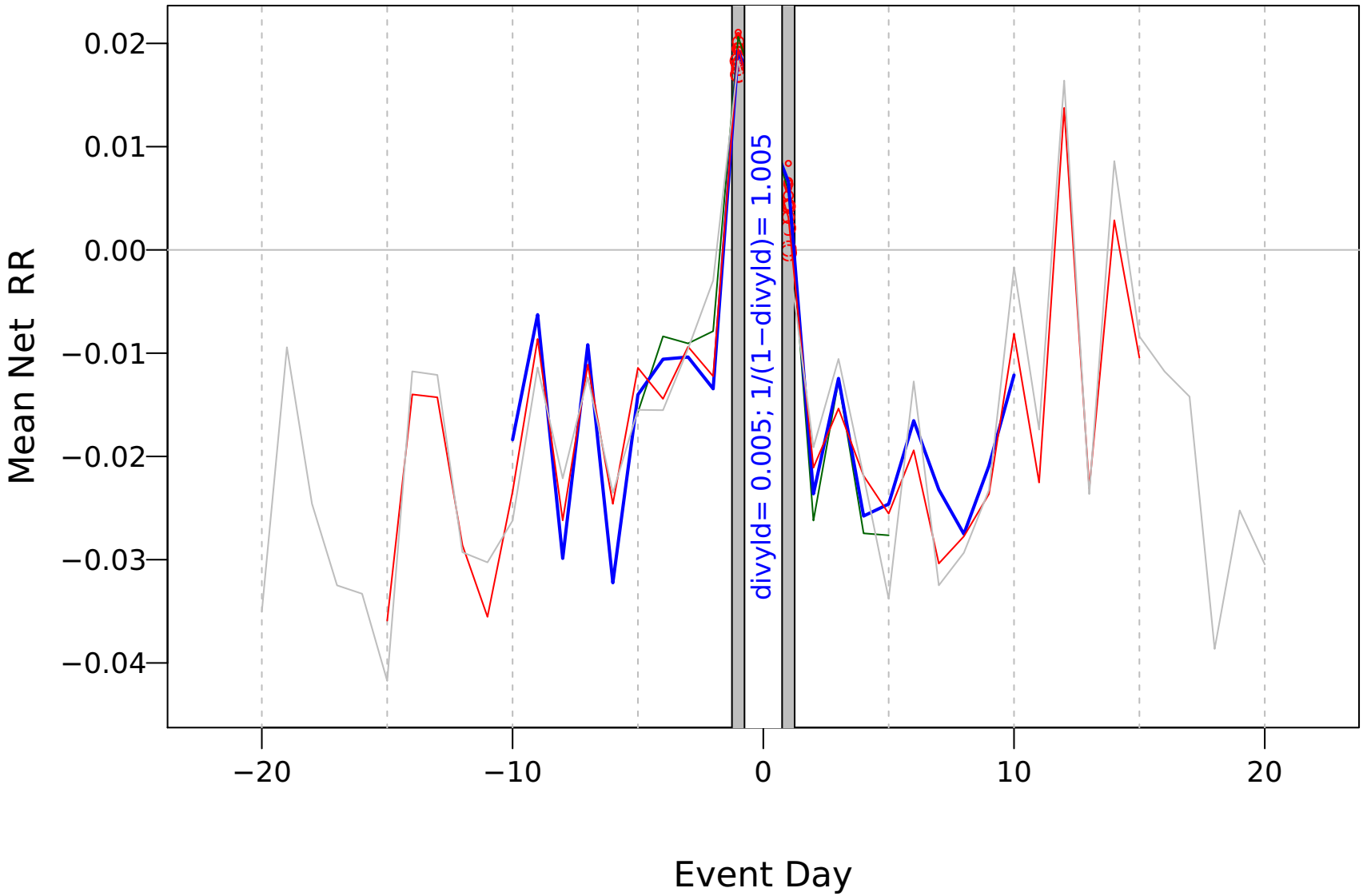


Means Prediction, $1\% < \delta < 2\%$ (scale change)



Means Prediction, $\delta < 1\%$ (scale change)



Meaning

- Economically Significant: about 30bp for 75 bp payment. Up to 100bp over two weeks for high-yield stocks.
- Super-solid.
- In other words: investors bid the price up too much before the payment. Investors just want to “get in.”
- (Market-beta: similarly perverse)

PreDeclared Seasoned Equity Offerings

Not exactly the same and dirtier, but in line: decreases in vol and **increases** in means.

Average Daily Returns Net of Market

	Return	Abs Return	
Week Before	–0.041%	4.63%	
Week Of	–0.448%	5.03%	–1.4% on day 0
Week After	0.078%	3.46%	

Average return is higher and volatility is lower after the offering.

Theory

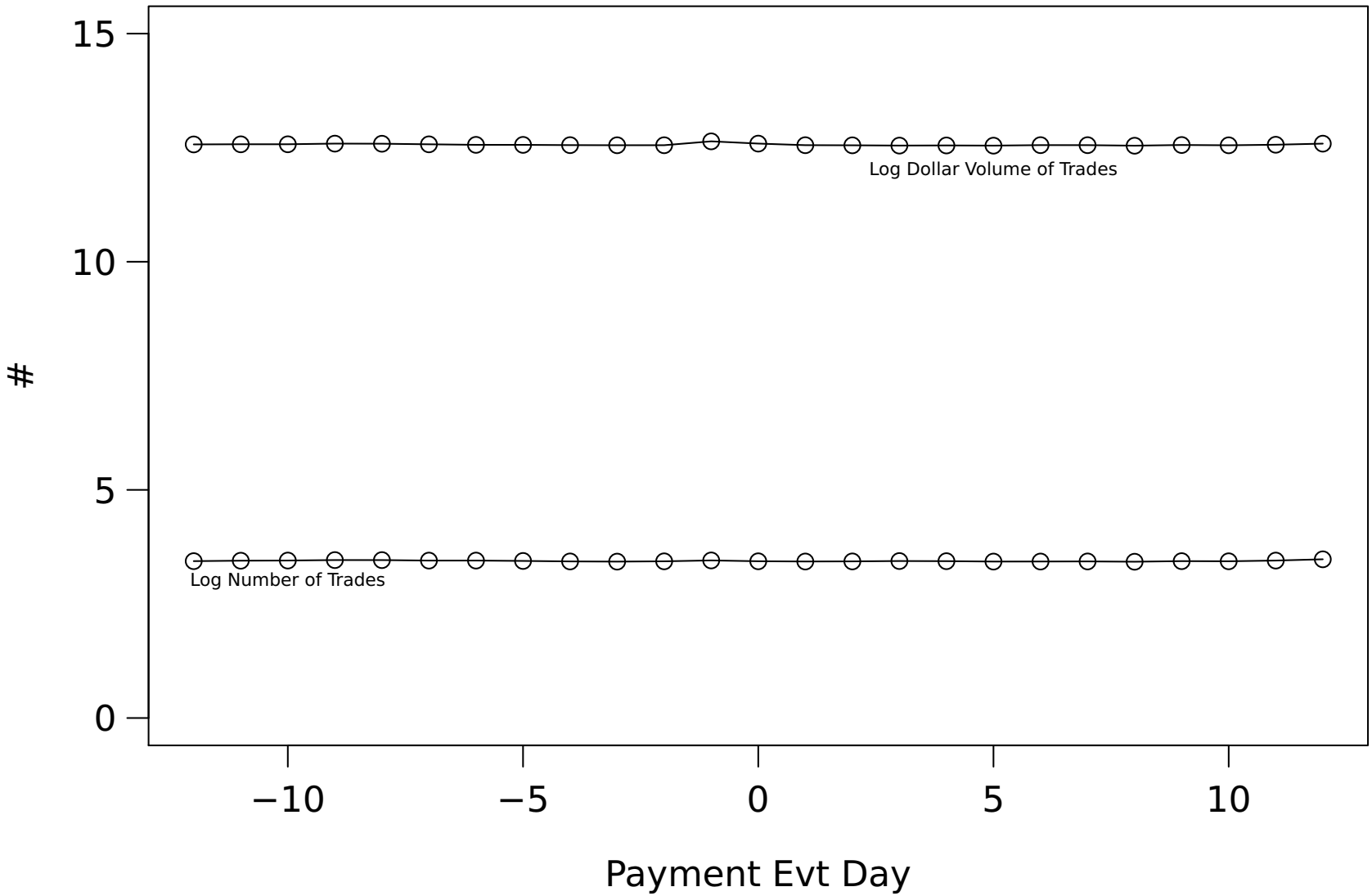
- Solid rejection of leverage-theory prediction in this context. Do investors “like” leverage and risk??
- ...not inconsistent with long-horizon findings (higher levered firms do not offer higher average returns), but also not inconsistent with Gomes-Schmid.
  - (except to suggest not to declare victory too early)

What Can Explain This?

- Need to explain **both** increase in leverage **and** decrease in means.
- Empirical evidence is pretty strong.
- Leverage theory predicts increases in both.
- Most alternatives predict same direction on both means and volatility (risk and return).
- (Not long-short arb strategy, because of time-offset.)

Perhaps??

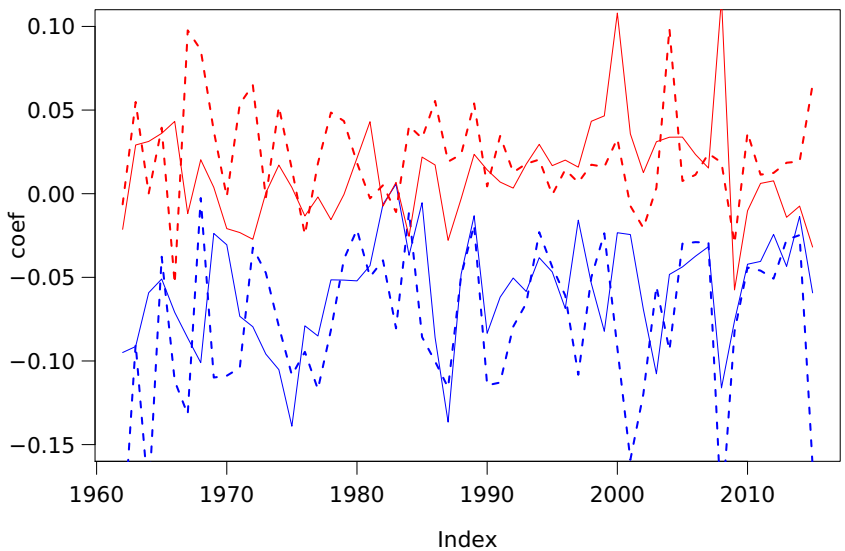
- Nothing liquidity related (e.g., tax-trading).


15
10
5
0
#
Log Dollar Volume of Trades
Log Number of Trades
−10
−5
0
5
10
Payment Evt Day

Perhaps??

- Taxes? Probably not.
  - Excluded Cum-Ex Return, but can also control for it, too.
  - Trivially low association of year-to-year trends and variations in dividend tax rates with documented mean drops.
- Nothing liquidity related.

Dividend Tax and Effect



Continued

- Direct Preferences?! Meaningless
- Timing. Implausible (how??) and not both.
- Selection and survival. Not plausible magnitude-wise
- Cash holdings. Theoretically meaningless. Besides, usually in cash 2-5 days before payment and just lower cash afterwards.
- Other investments.
- Negative loadings?!
- Random noise: also in all partitions

Continued

- Investors like leverage (and its concomitant volatility?!)
- Possibly via mutual funds, Harris-Hartzmark-Solomon 2016.
  - But also in first half of sample, with fewer mutual funds.
  - But also in seasoned equity offerings.
  - No direct link—"merely" consistent. Trading remains anonymous. HHS uses quarterly data for inference.
- See long-term evidence, but not theory.

Conclusion of Evidence

- Small but common asset-pricing effect. Rare exogenous chg.
- Common important but small corporate-finance event.

- Pretty convincing (IMHO) evidence that capital markets did not respond **in this context** in the way that our most basic risk-return theories say they should have.