

# The CAPM Evidence

(Welch, Chapter 10-C)

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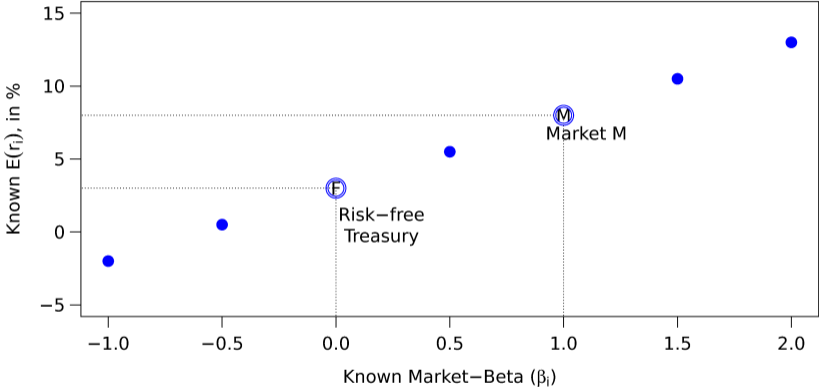
# Truthiness

- ▶ **Is the CAPM True?**
  - ▶ So what?
  - ▶ No model is *strictly* true,
  - ▶ but models can be good and useful, or bad and useless.
- ▶ Do its assumptions seem reasonable?
- ▶ Did high-beta stocks (say, 1.5) outperform low-beta stocks (say, 0.5) by about 2-4% per annum?

# Security-Market Line (SML)

- ▶ The SML has market-beta on its x-axis and expected return on the y-axis.
- ▶ How should the SML look like if you knew the true inputs?

# Graph: SML Exact

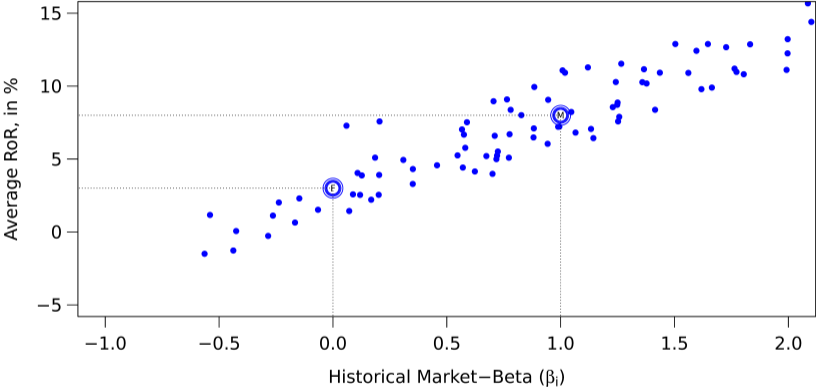


**Figure 1: beta**

# SML with Estimated Inputs

- ▶ How should the CAPM SML look like if you had to estimate the CAPM inputs first?

# Graph: SML Noisy

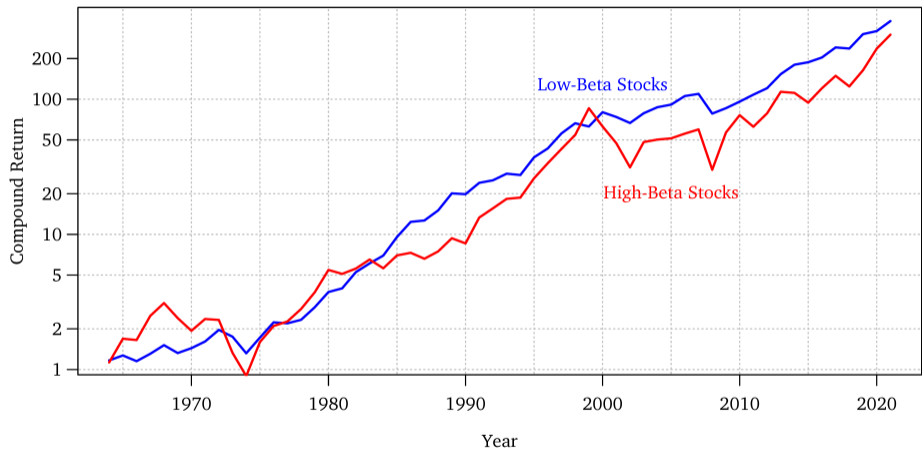


**Figure 2: beta**

# Most Basic CAPM Implication

- ▶ Stocks with high market-betas should outperform stocks with low market-betas.
  - ▶ Unfortunately, the evidence is *not* favorable.
  - ▶ The real-world SML is too flat and probably even negative!
- ▶ Let's plot the empirical performance of beta (quintile) portfolios

# Damning Evidence



**Figure 3: beta**



- ▶ It's not my fault that the world is using a terrible model!
- ▶ I am just the messenger!
  - ▶ Don't shoot the messenger
- ▶ You will be expected to know this model!

# Specific Alternative Tests

Furthermore:

- ▶ Some other factors *may* matter, such as momentum, value, profitability, etc.
  - ▶ undoubtedly, they did in the past, though
  - ▶ not clear if they will in the future.
- ▶ And, even if the CAPM were better, for corporate CoC estimates, how good would its point estimates be??
  - ▶ truly terrible accuracy, almost useless, anyway.

# But Shouldn't The CAPM Have Held?

- ▶ Not necessarily.
  - ▶ Do you care about house wealth? Hedge it!
  - ▶ Do you care about labor income? Hedge it!
- ▶ Is the market near perfect?
  - ▶ Do investors have different opinions?
  - ▶ Are most investors reasonably invested?
- ▶ Did you know the inputs?
  - ▶ What is the equity premium?

- ▶ Do the (important) investors hold the market and tilt towards low-beta stocks **if** these stocks offer too high an expected RoR?
  - ▶ mandates on (large) funds could interfere;
  - ▶ belief in superior ability could interfere;
  - ▶ agency conflicts could interfere.
- ▶ Market-correcting forces are neither strong nor quick:
  - ▶ There is no easy way to take advantage.
  - ▶ If you are smarter and the CAPM does not hold, you can create only slightly better bets for yourself
    - ▶ you should tilt towards low-beta stocks;
    - ▶ it's been happening!

# Why Learn The CAPM?

- ▶ Does the CAPM give reasonable CoC estimates?
  - ▶ Probably not.
  - ▶ Think stopped clock twice a day.
- ▶ It is a beautiful bedtime story: the world is ok.
- ▶ It gives good intuition.
  - ▶ It makes internal sense (under its strong assumptions).

# Why Study the CAPM?

- ▶ All alternatives that predict better are *ad-hoc*.
- ▶ There is no standard widely agreed-upon alternative.

- ▶ My personal educated guesses:
  - ▶ debt has a lower costs of capital,
  - ▶ longer-term projects require higher costs of capital.
  - ▶ we cannot predict  $E(r)$  for **publicly-traded** (large) stocks.
- ▶ I prefer “asset-class based capital budgeting” (benchmarking), somewhat akin to assuming equal betas of 1 for all stocks (equities)
  - ▶ Not in wide use, but well backed up by data.
  - ▶ Generically, benchmarking is in good use.

# Why Study the CAPM?

- ▶ Who is using the CAPM?
  - ▶ CFOs, regulators, courts, IRS, etc.
  - ▶ Other textbook authors!



# Corporate Survey Evidence

**73% of managers claim that it is the CAPM that they use.**

- ▶ However, they mitigate the harm, because they also typically set a hurdle rate considerably above their  $E(R)$ .
- ▶ Thus, they claim they use it, but they really do not.

## Non-CAPM Alternative CoC Rules:

- ▶ “ad-hoc historical returns”: 39% frequency
- ▶ various modified CAPM models: 34% frequency
- ▶ “Gordon model” & “What investors are telling us”: 15%

# Why Study the CAPM?

- ▶ The CAPM is widely but incorrectly considered the “best-practice” model.
- ▶ If you don't understand it, you will be considered an uneducated noob.
  - ▶ In reality, most actual CAPM users are noobs,
  - ▶ but it is them who are in charge now,
  - ▶ educated in B-schools 20-40 years ago, when professors still believed that the CAPM worked.

# Cynics View: Why Still in Use?

- ▶ The real reasons why the CAPM is still in use:
  - ▶ Hazing — no longer by professors, but by practitioners?!
  - ▶ Fake Media?
  - ▶ Wishful thinking?
  - ▶ Reality Deniers?
  - ▶ Ignorance?
  - ▶ Bad textbooks?

## “CAPM Use” Warning

- ▶ **Don't use the CAPM unless you are forced.**
- ▶ Never expect much accuracy from the CAPM.
  - ▶ At best, ballpark cost-of-capital estimates.
- ▶ Never use the CAPM for portfolio investment decisions.
- ▶ Don't use it for short-term predictions,
- ▶ ...and don't use it for long-term predictions. (Really!)

# Disagreements Over PV?

- ▶ It is difficult to estimate the equity premium,
- ▶ and common beta input estimates often stink,
  - ▶ although one can get pretty good ones
- ▶ and you don't even know the right model or benchmark, either.
  
- ▶ Is it cold comfort that  $E(\text{CF})$  estimates are usually *even worse* than  $E(r)$  estimates?

# Nerddnotes: Omitted Appendices

- ▶ **Alternatives:** Multi-Factor Type Models. Not just beta, but potentially exposure to other factors. (Controversy: could be characteristics and market inefficiency.)
  - ▶ Arbitrage Pricing Theory (APT).
  - ▶ Fama-French-Momentum-Free-for-all.
- ▶ Factors keep moving around or disappearing, as are factor loadings.
- ▶ Alas, even these “custom” alternative have been pretty lousy forward-looking, too.

# Now What? Alternatives!

- ▶ Even if the CAPM holds, benchmarking can still work.
- ▶ Even if the CAPM fails, benchmarking can still work.
- ▶ But you need good benchmarks.
- ▶ C'est La Vie. In the land of the blind, the one-eyed man is king. — Desiderius Erasmus.