

# Benchmarking and Equity Premium

(Welch, Chapter 09)

Ivo Welch

# Maintained Assumptions

## **Perfect Markets**

1. No differences in opinion.
2. No taxes.
3. No transaction costs.
4. No big sellers/buyers—infininitely many clones that can buy or sell.

## **With risk and risk aversion**

- ▶ this chapter does not lean heavily on assumptions.

# Corporate Key Question

**What is your investors' cost of capital?**

We need the **opportunity cost of capital** as  $E(r)$  in the PV formula.

# Prerequisite Objective

As a corporate manager, your task is to act on behalf of your investors.

You are the custodian of owners' cash.

To compute NPV, what is your investors' opportunity cost of capital? Return the money if they can do better elsewhere!

# Skype Your Investors and Ask?

There are too many and often different and diffuse investors.

They don't want to become informed.

They don't want to be bothered.

# Reasonable Presumptions?

What are good presumptions about them?

- ▶ They are smart.
- ▶ They compare your projects to others that they could invest in elsewhere.
- ▶ They are reasonably diversified.

# Preferences?

What (project characteristics) do they like?

- ▶ Do they care about your firm?
- ▶ Do they care about you?
- ▶ Do they care about employees?
- ▶ Do they care about society?
- ▶ Do they care about abortion?
- ▶ Do they care about politics?
- ▶ Do they care about pollution?

# Specific Preferences?

Not 100% clear what investors (dis-)like.

Most likely:

- ▶ When will the payment come?
- ▶ Is the project and payment risky or safe?
- ▶ Is the market perfect? Is it liquid? Can they withdraw easily? How bad are their taxes?



# Risk or Co-Risk?

Do they care about how your project investment choices impact their overall portfolio?

- ▶ If so, then how should you assess how a new project contributes to their portfolios?

# Specific Term and Risk Preferences

What are good benchmarks for your project's term and risk premia?

When will the payments come?

▶ → Treasury Yield Curve

Is your project like corporate equity?

▶ → Equity Premium

# Equity Premium

The **equity premium** (or market risk premium): the difference between the *expected* RoR on the stock market and some risk-free RoR.

$$\text{EQP} \equiv E(r_M) - r_F.$$

- ▶ View it as a *normalized* way of quoting the expected RoR on the stock market.

# Risk-Free vs Risky Components

- ▶ Use leverage to split your (intermediate-risk) project into one project that looks safer and one that looks less safe.
- ▶ Then benchmark your safer and riskier components separately.
- ▶ Stocks pay off in the distant future.
- ▶ Bonds pay off in the future.
- ▶ Bills pay off soon.

# Perhaps Better: Corp YC?

You could look at the corporate-bond yield curve instead of Treasury yield curve.

- ▶ **But take out the default premium.**
- ▶ Your investors will not earn it on average.

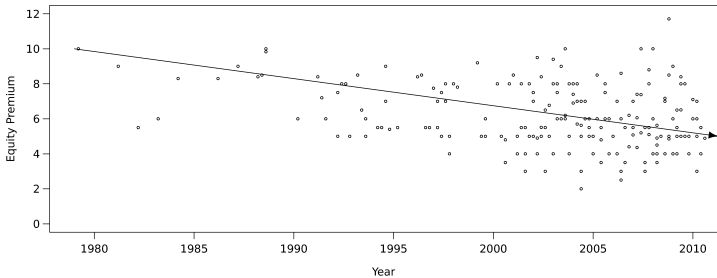
# Equity vs Risk-free?

Are there other contexts in which you care about the difference between the equity premium and the risk-free rate?

# Good Project Benchmark?

- ▶ Where do you read off the risk-free rate?
- ▶ What is it today?
- ▶ Where do you read off the equity premium?
- ▶ What is it today?

# Graph: Textbook Authors



**Figure 1:** Fernandez Survey



# Comparability

Benchmark returns (such as the equity premium) also depend on how you quote them.

- ▶ Do investors care about geometric or arithmetic?
- ▶ Are CoC estimates more important for long-term projects or short-term projects?
- ▶ Watch out: get  $E(CF)$  in the PV numerator right! Do not apply  $E(R)$  to promised cash flows.

# M1: Historical Geometric Averages

Standing today, looking backwards for  $x$  years, how did stocks perform geometrically above bonds (and bills and inflation)?

Is there a term premium for equity? Not clear.

# Graph: Historical Geo

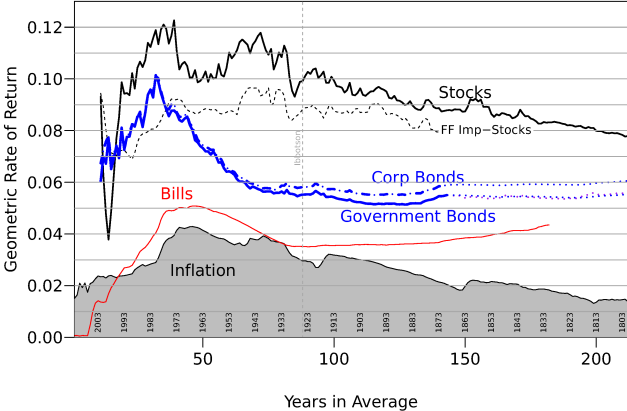


Figure 2: Geometric Return

# Reconciling Equity Premia

- ▶ Arithmetic Equity Premium vs Short-Term Bonds **1926** to 2019:  $\approx 8\%$
- ▶ Minus Later Sample Period **1970** to 2019:  $-2\%$
- ▶ Minus Long-Term T-Bonds Instead of Short-Term T-Bills:  $-1\%$
- ▶ Minus Use of Geometric Return:  $-2\%$
- ▶ Minus Cross-Product of Above Three:  $-1\%$

Geometric Equity Premium vs Long-Term Bonds, 1970-2019:  $\approx 1-2\%$

# *Peso Problem (Black Swans)*

Question: What about rare shocks??

= *Peso Problem* (Academics), or

= *Black Swan* (Nassim Taleb).

(important in academia *and* practice!)

# Peso Answer

Was at most 1-2% of historical equity premium.

Not unimportant, but it was and is insurable with index options.

Remaining risk (long-run unforeseen stagnation) is harder to insure.

## M2: History Implication?

Are high historical stock market returns indicative of higher or lower future stock market returns?

## M3: Predicting EQP?

Would high or low dividend yields predict higher future market RoRs? Theoretically? Practically? Today?

- ▶ Theoretically, higher.
- ▶ But not (strongly) according to empirical evidence.
- ▶ Recently, D/P predicted negative equity premia!



## M4: Equity Premium

What equity premium would it take to attract investors into the stock market, assuming no gifted horses?

- ▶ 1-2% per annum would seem reasonable.
- ▶ 3% means ending up with twice as much money for an investment over 25 years. This seems ridiculously high.

## M5: Couldn't We Just Ask Experts?

It is *The blind leading the blind*.

Where do you think they got their opinions from?

- ▶ PS: you need to adjust how different answers have quoted the equity premium.

# Big Survey Numbers

- ▶ Ordinary investors. — Tend to follow recent experience. 15%/year in 2000.
- ▶ McKinsey Corporate Consulting. — 5% to 6%
- ▶ Social Security Admin. — 4%
- ▶ Professors of Finance. — 4% to 5.5%
- ▶ Me? i-san. 2%.
  - ▶ I was badly wrong (too pessimistic) from 2014 to 2019!

# CalPERS: Shrugworthy?

CalPERS has to decide what their expected (geometric) RoR should be.

- ▶ they used a geo market premium of 7% in 2019.
- ▶ which is 5% above prevailing Treasury bond!

# CalPERS: Or Not Shrugworthy?

If this seems unrealistic to you—to me, too.

But lowering this estimate would mean that California would have to set aside money for unfunded pension obligations *today*.

Politicians prefer to leave optimistic estimates as is, and kick the can down the line to their successors.

# CalPERS: Problem Dimension

0.25%/year difference on \$300 billion:  
 $\approx$  \$750 million.

Can pay for a lot of political projects  
... and hordes of equity premium consultants!

# Time Variation?

Many individuals give equity premium forecasts which depend on the forecasting interval.

- ▶ like a belief that market is over- or under-valued, and they can predict the market.

Expected value forecasts *should* not change dramatically from year to year.

- ▶ based on technology, competition, preferences.
- ▶  $P$  should adjust rapidly, not  $E(R)$ !

# M6: ROR/ICC

Accounting Models (RoR) and/or ICC.



# Time-Dependence

Everyone agrees that SD is higher than  $E(R)$  for market equity.

SD on the order of 15% to 20% per annum.

But which mean equity premium is right?

1%? 3%? 6%?

Be reasonable. Be consistent. Pray.

# Asset Debt Costs of Capital

Fortunately, firms care about easier-to-assess asset CoC, not equity CoC.

$$E(R) = w_D \cdot E(R_D) + w_E \cdot E(R_E)$$

- ▶ If not too highly levered, well-collateralized, safe corporate debt should have  $E(R)$  only very modestly above the US Treasury.
- ▶  $E(R_D)$  is not the *quoted* but the *expected* yield.

# Asset Costs of Capital

Firms can value-weight their debt and equity cost of capital. So, if...

- ▶ cost capital of similar **Debt**: 5%,
- ▶ cost capital of similar **Equity**: 10%,
- ▶ and their project is 80% debt and 20% equity,
- ▶ then their cost of capital is  $\approx 6\%$ .

$$E(R) \approx 80\% \cdot 5\% + 20\% \cdot 10\% = 6\%.$$

# Pricing a Condo?

If you want to price a condominium, which risk-free rate and equity premium should you use?

# Common Sense

Don't be stupid! Retain common sense!

To price a condo, use other condos and not the stock market.

If many other Xs have been bought and sold at arms length, Xs are better benchmarks.

Find the best benchmarks!