THE UNIVERSITY OF QUEENSLAND
AUSTRALIA
CREATE CHANGE

Lecture 7: Cost of Capital & Political Risk

Reading: Eun & Resnick Ch.17 (10th ed.)

Introduction

- Cost of capital can be defined as the MINIMUM rate of return a firm has to pay in order to entice investors to buy and hold its securities.
  - Given by WACC – weighted average of the financing costs

- Question: Should the cost of capital of foreign projects be higher or lower than that of domestic investment?

Capital Market Segmentation

- If all capital markets are fully ***integrated***, securities of comparable expected return and risk should have the same required rate of return in each national market after adjusting for foreign exchange and political risks.

- A national capital market is ***segmented*** if the required rate of return on securities in that market differs from that for securities of comparable expected return traded on other national securities markets (e.g., New York and London).

Causes of Segmentation

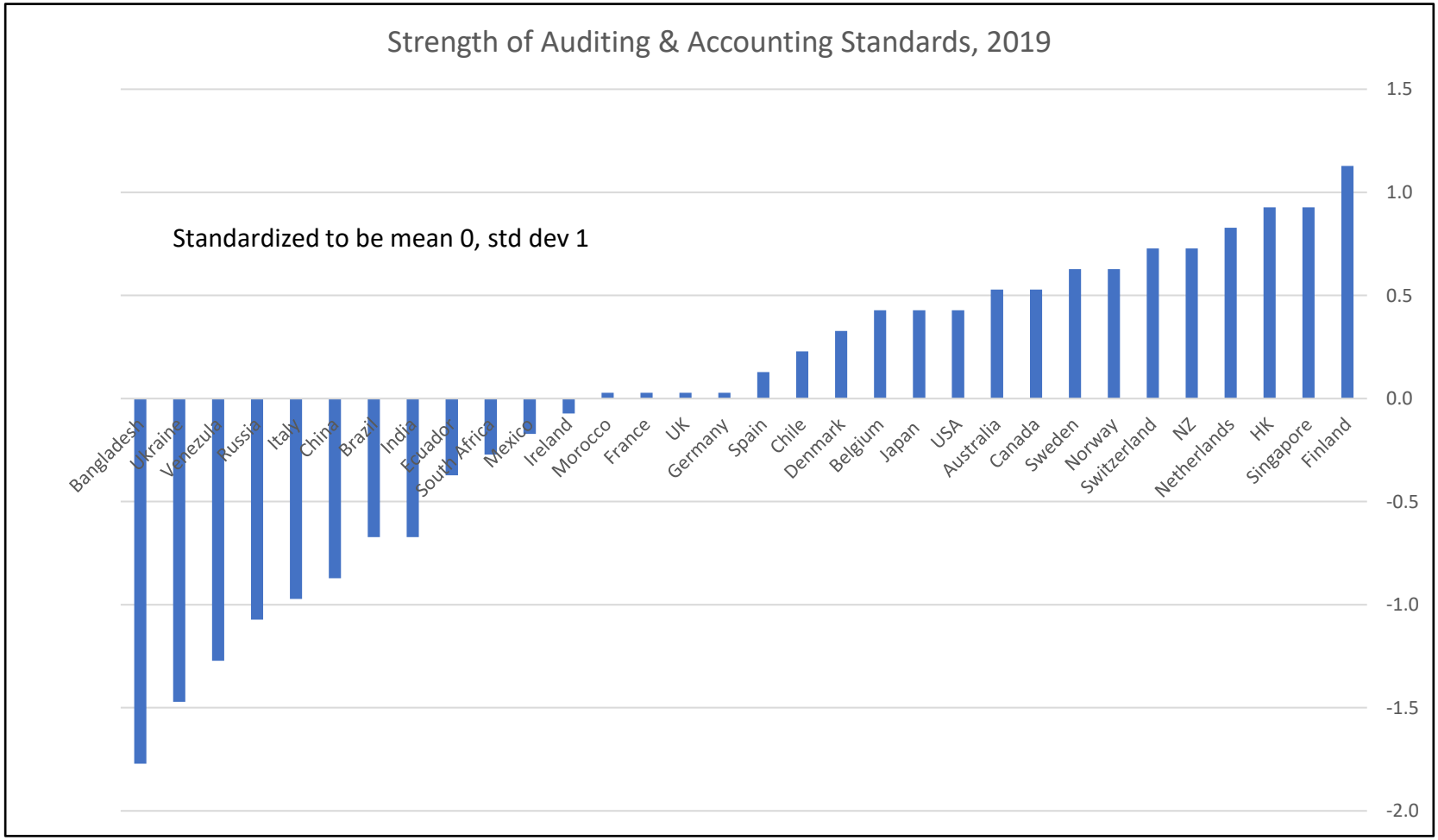
- Market segmentation is a financial market imperfection caused by government constraints and investor perceptions.

- The most important imperfections are:
  - Information Barriers – Lack of transparency & information disclosure
  - Market illiquidity
  - Transaction Costs
  - Regulatory Barriers/Capital Controls
  - Foreign Exchange Risk
  - Country Risk (and Political Risk)

Information Production is no Accident

- US ***Disclosure Laws*** *:Securities Act of 1933, Reporting Act of 1934*
- Mandate quarterly and annual filings of all public firms
  - The rules are well-understood standards (GAAP) that are audited and certified
  - The rules are enforced with rigor by the US government (SEC)
- Information production results from a deliberate effort to establish:
  1. Laws
  2. Institutions – In common law countries, we take this for granted. However, in many countries the view is that the “secrecy” of corporate information is more important than the dissemination of information to the investor.

Accounting Disclosure Index



Source: World Economic Federation

Market Liquidity

- ***Market Liquidity*** is the degree to which a firm can issue a new security without depressing the existing market price, as well as the degree to which a change in price of its securities elicits a substantial order flow.
  - A firm can tap capital market for only some limited amount in short run before suppliers of capital balk at providing further funds.

- In the multinational case, a firm can improve market liquidity:
  - By raising funds in the Euromarkets (money, bond, and equity)
  - By directed security issues in individual national capital markets, and
  - By tapping local capital markets through foreign affiliates.

Transaction Costs

- How much does it cost to buy or sell securities?
- Why is this important to know?
  1. Transactions costs can wipe out trading profits, so ignoring them lead to incorrect asset allocation strategies.
  2. Price impact in emerging markets, a.k.a. “hot money”, can destabilize markets.
  3. Large costs in foreign markets can lead firms to list their stock in the U.S. or other developed markets, further hindering domestic market development.
- How large are transaction costs globally?
  - Difficult to estimate, but there is some research on this.

Equity Trading Costs

Region		Avg. Commission (BPS)				
		2021Q4	2021Q3	2021Q2	2021Q1	1Q21-4Q21
United States	Micro Cap	14.0	10.6	8.1	11.0	10.4
	Small Cap	11.9	10.5	9.2	12.2	11.0
	Mid Cap	4.9	5.1	4.7	5.0	5.0
	Large Cap	2.4	2.4	2.4	2.4	2.4
	Total	**2.8**	**2.9**	**2.8**	**2.9**	**2.9**
United Kingdom	Micro Cap	5.4	6.3	7.9	6.6	6.5
	Small Cap	6.9	5.7	6.7	6.8	6.5
	Mid Cap	5.3	5.3	5.0	5.2	5.2
	Large Cap	4.4	4.2	4.4	4.4	4.3
	Total	**4.6**	**4.4**	**4.5**	**4.5**	**4.5**
Japan	Micro Cap	3.1	2.9	3.3	3.6	3.3
	Small Cap	3.4	3.2	3.6	3.6	3.5
	Mid Cap	4.0	4.1	3.8	4.2	4.0
	Large Cap	3.9	4.1	4.1	4.1	4.1
	Total	**3.9**	**4.1**	**4.0**	**4.1**	**4.0**
Canada	Micro Cap	8.2	11.4	10.6	7.3	9.1
	Small Cap	11.7	12.1	12.6	14.0	12.8
	Mid Cap	9.3	8.4	9.0	9.0	9.0
	Large Cap	4.1	4.2	4.4	5.0	4.5
	Total	**5.5**	**5.3**	**5.7**	**6.3**	**5.7**
Europe ex UK	Micro Cap	4.0	4.4	6.4	6.2	5.1
	Small Cap	5.1	5.1	5.2	5.2	5.2
	Mid Cap	4.5	4.5	4.7	4.8	4.6
	Large Cap	4.0	4.1	4.2	4.2	4.1
	Total	**4.0**	**4.1**	**4.2**	**4.3**	**4.2**
Asia Pacific ex Japan	Micro Cap	6.1	6.0	6.8	5.6	6.0
	Small Cap	6.0	5.6	5.5	5.6	5.7
	Mid Cap	5.4	5.6	5.9	5.9	5.7
	Large Cap	5.2	5.8	5.7	5.8	5.6
	Total	**5.3**	**5.7**	**5.7**	**5.8**	**5.6**
Emerging Markets	Micro Cap	8.7	8.0	8.9	8.4	8.5
	Small Cap	7.6	7.0	7.3	6.8	7.1
	Mid Cap	7.4	7.3	7.2	7.3	7.2
	Large Cap	7.5	7.6	7.1	7.5	7.4
	Total	**7.5**	**7.5**	**7.1**	**7.5**	**7.4**

Source: Virtu Cost Review (2022)

Total Trading Costs (BPS)

	2009	2012	2015	2018	2021
US	53.4	45.9	47.1	37	42.6
UK	43.5	57.4	54.9	59.6	49.5
Japan	66	65.2	56.1	56.1	49.1
Canada	58.5	41.9	59.7	50.9	38.1
Asia Pacific ex-Japan	75.4	57.1	57.9	53.4	54.8
Europe ex-UK	44.8	45.3	44.1	46.4	36.8
Emerging markets	91.5	93.3	91.8	74.8	70
Emerging markets (Asia)	93.9	85.3	80.3	76.7	67.7
Emerging Europe	115.5	88.2	104.2	52.6	77.4
Latin America	65.1	105.1	120.3	84.8	90.5
Africa & Middle East	111.7	135.1	124.2	55.7	65.3

Source: ITG Cost Review 2019; Virtu Cost Review (2022)

Total Trading Costs: Average commission + IS cost

Why worry about Transaction Costs?

- Study by Domowitz, Glen & Madhavan (2001)
- **Very Important to Returns:** The equally-weighted portfolio of all countries has one-way trading costs of 71.3 bps*.
  - If this portfolio is turned over every six months, annual costs of 2×2×71.3 = 285 bps are incurred.
  - By contrast, the average annual portfolio return (pre-cost) is 12.28%.
- Trading costs constitute 23 percent of raw returns in this scenario!

* bps – basis points

Measuring Country Risk

- Difficult to define and therefore to measure

Country risk = ability to pay

+

willingness to pay

- Incorporates political stability and economic measures, capital flight, a country's resource base and privatization measures, sovereign rating etc. Long run economic health is a good indicator.

Sovereign Ratings

Sovereign Ratings List			
	Moody's ratings [+]	S&P ratings [+]	Fitch ratings [+]
United States [+]	Aaa	AA+	AAA
United Kingdom [+]	Aa3	AA	AA-
Germany [+]	Aaa	AAA	AAA
France [+]	Aa2	AA	AA-
Japan [+]	A1	A+	A
Spain [+]	Baa1	A	A-
Italy [+]	Baa3	BBB	BBB
Portugal [+]	A3	A-	BBB+
Greece [+]	Ba1	BBB-	BB+
Ireland [+]	Aa3	AA	AA-
Andorra [+]		BBB+	A-
United Arab Emirates [+]	Aa2	AA	AA-
Albania [+]	B1	BB-	
Armenia [+]	Ba3	BB-	B+
Angola [+]	B3	B-	B-
Argentina [+]	Ca	CCC	C
Austria [+]	Aa1	AA+	AA+
Australia [+]	Aaa	AAA	AAA
Azerbaijan [+]	Ba1	BB+	BB+
Bosnia and Herzegovina [+]	B3	B+	
Barbados [+]	B3	B-	
Bangladesh [+]	B1	BB-	BB-
Belgium [+]	Aa3	AA	AA-
Burkina Faso [+]		CCC+	
Bulgaria [+]	Baa1	BBB	BBB
Bahrain [+]	B2	B+	B+
Benin [+]		NR	B+
Bolivia [+]	Caa1	CCC+	B-
Brazil [+]	Ba2	BB	BB-
Bahamas [+]	B1	B+	
Botswana [+]	A3	BBB+	
Belarus [+]	C	NR	RD
Belize [+]	Caa2	B-	
Canada [+]	Aaa	AAA	AA+
Democratic Republic of the Congo [+]		B-	
Republic of the Congo [+]		B-	CCC+
Switzerland [+]	Aaa	AAA	AAA

Source: CountryEconomy.com April 2024

What about Taxes?

- Governments can alter the rules that were in place when the MNCs made their investment.

  E.g., Increase in QLD coal royalty rates in June 2022.

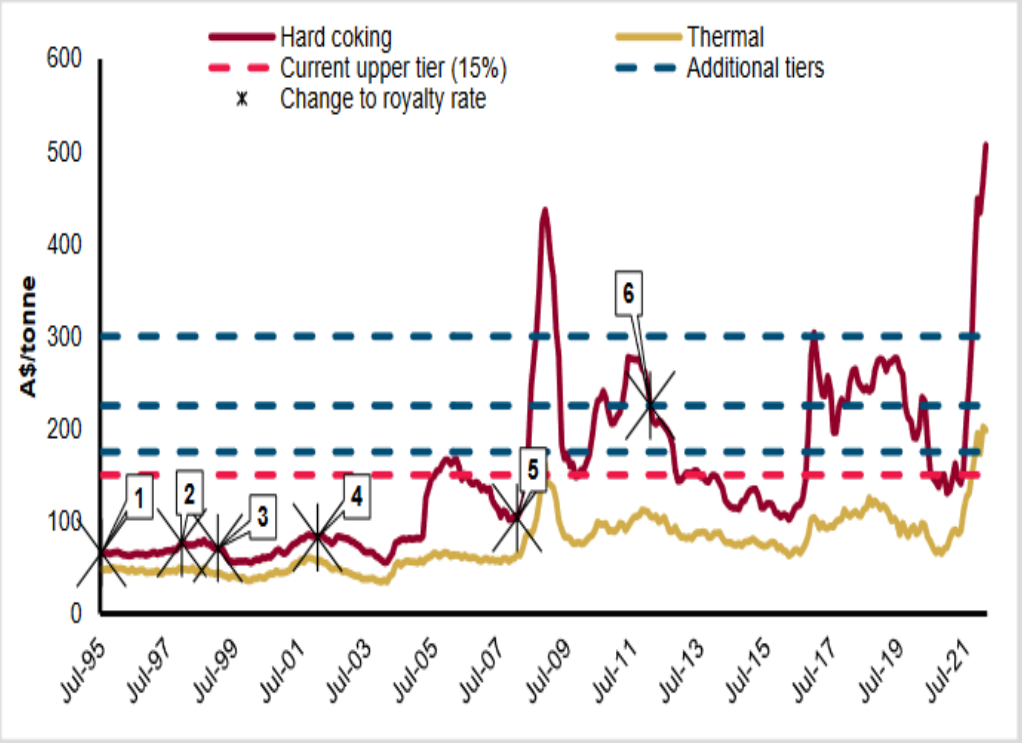
- Differential taxation rates for foreign investors (e.g., dividend withholding tax in many countries).

  E.g., Dividend withholding taxes on non-resident investors in Australia is

  10% for interest payments

  30% for unfranked dividends & royalty payments.

Chart 4.7 Historical average coal prices



Source: QLD Government Budget Strategy and Outlook 2022–23

What about capital controls?

- Various foreign exchange controls are often imposed, especially in Emerging Markets.
- Some countries have special classes of shares for foreigners (e.g., China, Mexico, Philippines)
- Some allow only “authorized foreign investors” to trade in their markets (e.g., India, Taiwan).
- Different classes of shares and their pricing: shares for foreign investors may sell at a discount or premium to domestic shares.
- Repatriation restrictions (e.g., Chile, Malaysia) and the prevention of conversion from local currency into foreign currency.

ICRG Country Risk Components

POLITICAL RISK COMPONENTS	
Component	Points (Max.)
Government Stability	12
Socioeconomic Conditions	12
Investments Profile	12
Internal Conflict	12
External Conflict	12
Corruption	6
Military in Politics	6
Religious Tensions	6
Law and Order	6
Ethnic Tensions	6
Democratic Accountability	6
Bureaucracy Quality	4
Maximum Total Points	**100**

FINANCIAL RISK COMPONENTS	
Component	Points (Max.)
Foreign Debt/GDP	10
Foreign Debt Service/Exports	10
Current Account/Exports	15
Net Liquidity as months of Import Cover	5
Exchange Rate Stability	10
Maximum Total Points	**50**

ECONOMIC RISK COMPONENTS	
Component	Points (Max.)
GDP per head of Population	5
Real Annual GDP Growth	10
Annual Inflation Rate	10
Budget Balance/GDP	10
Current Account Balance/GDP	15
Maximum Total Points	**50**

Measuring Country Risk

		CURRENT RATINGS			COMPOSITE RATINGS	
		Political Risk	Financial Risk	Economic Risk	Current	Year Ago
Rank	COUNTRY	07/16	07/16	07/16	07/16	08/15
1	Switzerland	87.5	45.5	44.0	88.5	88.5
2	Norway	86.5	45.5	44.0	88.0	87.0
3	Luxembourg	87.0	42.0	45.0	87.0	85.5
4	Singapore	81.5	46.0	45.0	86.3	85.3
5	Sweden	86.5	41.0	44.5	86.0	84.5
6	Germany	84.0	42.0	44.0	85.0	83.8
7	New Zealand	88.0	38.0	40.5	83.3	80.8
8	Taiwan	79.0	45.5	41.5	83.0	82.8
9	Canada	87.5	39.0	39.0	82.8	79.8
10	Korea, Republic	77.5	44.5	43.0	82.5	80.3
11	Netherlands	84.0	37.5	43.5	82.5	80.3
12	Ireland	85.5	34.0	44.5	82.0	81.5
13	Denmark	77.0	44.5	42.0	81.8	81.8
14	Japan	82.5	42.5	38.5	81.8	81.3
15	Finland	86.5	36.5	39.5	81.3	81.0
16	Hong Kong	77.0	41.5	43.0	80.8	80.5
17	Iceland	85.5	33.5	42.0	80.5	82.0
18	Austria	81.0	37.0	41.0	79.5	78.5
19	Czech Republic	78.0	40.5	40.5	79.5	77.5
20	United States	84.0	35.0	39.5	79.3	78.0
21	Poland	79.0	38.5	40.0	78.8	76.3
22	Australia	84.0	33.0	39.5	78.3	75.8

		CURRENT RATINGS			COMPOSITE RATINGS	
		Political Risk	Financial Risk	Economic Risk	Current	Year Ago
Rank	COUNTRY	07/16	07/16	07/16	07/16	08/15
118	Ecuador	54.0	36.5	29.5	60.0	62.3
119	Ukraine	60.5	31.0	28.0	59.8	54.5
120	Ethiopia	52.0	34.0	31.0	58.5	60.0
121	Nigeria	44.0	38.0	35.0	58.5	59.0
122	Egypt	51.0	35.0	28.5	57.3	59.5
123	Haiti	44.5	38.0	31.5	57.0	58.0
124	Iraq	40.0	41.0	32.0	56.5	58.3
125	Congo, Dem. Republic	39.0	38.5	34.5	56.0	56.3
126	Korea, D.P.R.	49.0	33.5	29.5	56.0	55.8
127	Malawi	51.5	31.5	28.5	55.8	57.5
128	Zimbabwe	47.5	32.0	32.0	55.8	55.3
129	Angola	51.5	34.0	25.0	55.3	62.3
130	Niger	49.0	30.5	28.0	53.8	49.5
131	Sierra Leone	57.0	30.0	20.5	53.8	60.3
132	Liberia	51.0	34.5	20.5	53.0	50.5
133	Yemen, Republic	40.0	39.0	22.0	50.5	54.0
134	Libya	52.0	37.5	10.5	50.0	50.0
135	Mozambique	60.0	16.5	23.5	50.0	54.5
136	Sudan	35.0	30.0	32.0	48.5	46.5
137	Guinea	50.5	22.5	22.0	47.5	51.8
138	Syria	42.0	34.5	17.0	46.8	35.8
139	Somalia	33.0	21.5	28.5	41.5	41.5
140	Venezuela	44.0	25.5	12.5	41.0	52.0

*** ICRG's Country Risk Rankings (July 2016)**

Corruption

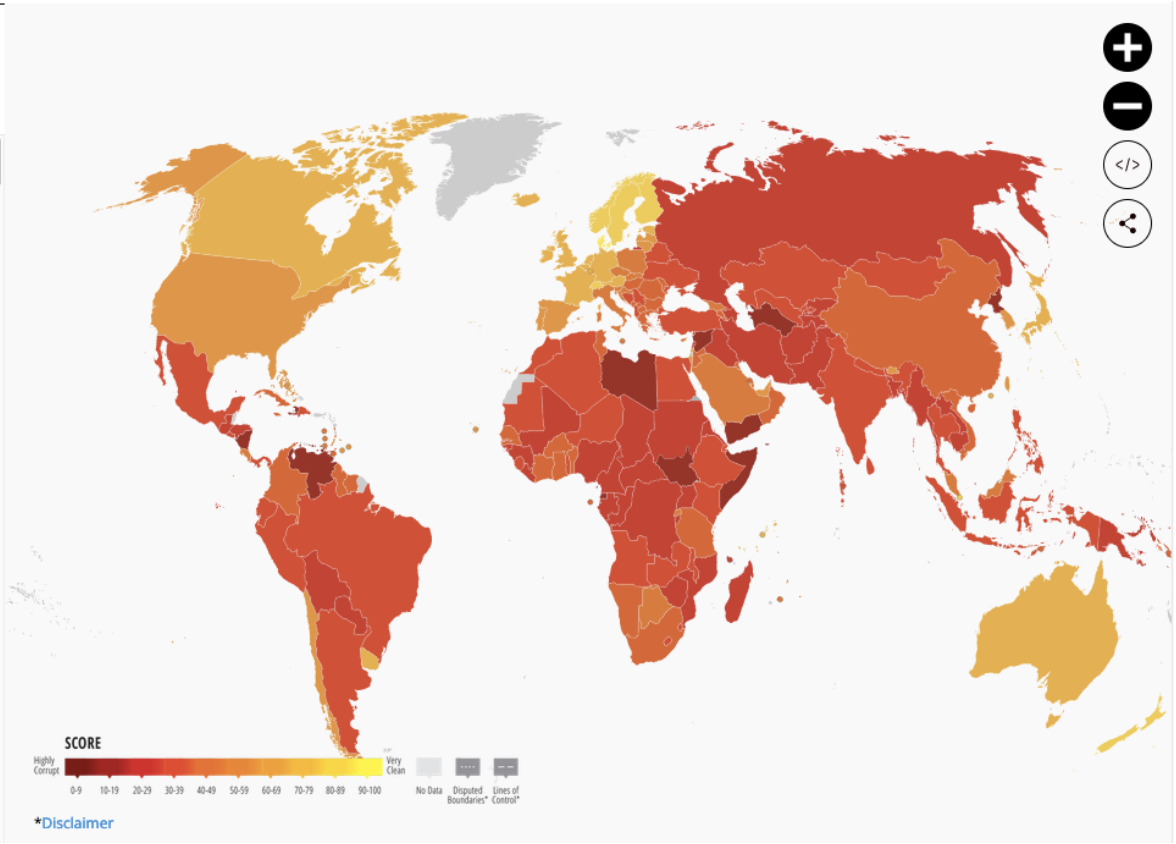
- Illegitimate payments and favors outside the rule of law
- Corruption occurs to some extent in all countries, but large differences across countries exist

"There is no end in sight to the misuse of power by those in public office - and corruption levels are perceived to be as high as ever in both the developed and developing worlds" - Peter Eigen, Chairman of Transparency International, speaking at the launch of the Corruption Perceptions Index.

Corruption Index, 2023

Search

Score	Country	Rank
90	Denmark	1
87	Finland	2
85	New Zealand	3
84	Norway	4
83	Singapore	5
82	Sweden	6
82	Switzerland	6
79	Netherlands	8
78	Germany	9
78	Luxembourg	9
77	Ireland	11
76	Canada	12
76	Estonia	12
75	Australia	14



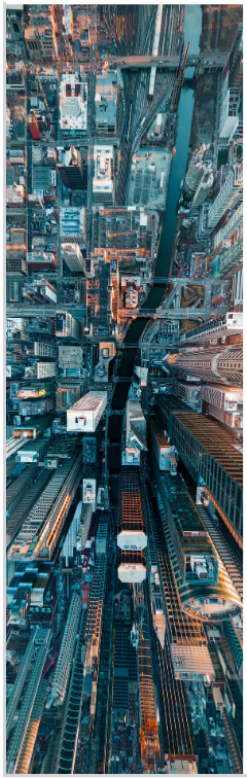
Political Risk

- Political Risk can be described the influence of non-business events on the value of the firm.
- It is more than Expropriation. Can also be
  - currency or trade controls
  - changes in tax or labour laws
  - changes in ownership policies
  - Political problems etc.
- Political Risk can be decomposed into:
  - **Macro Risk** which affects all firms
    - Expropriation (See slide on Russian Oligarchs; Argentina)
    - Ethnic Strife (Balkans, Rwanda, Russia/Ukraine etc.)
  - **Micro Risk** which affects specific firms or industries

Political Risk

- **Expropriation** is defined as official government seizure of private property.
  - It is recognized by international law as the right of any sovereign state, provided the expropriated owners are given:
    - prompt compensation
    - at fair market value
    - in convertible currencies.
- Problems with Expropriation Conditions:
  - Promptness is usually delayed by extensive negotiations and appeals
  - Fair market value is in the eyes of the beholder
  - Compensation in convertible currencies is usually difficult.

Political Risk in 2022-2023



01| **Political risk ratings for 2022 saw a universal deterioration in the trading environment driven by changes in both sovereign credit risk and country economic risk**

Region	Security environment			Trading environment			Investment environment		
	Strikes, riots, & civil commotion	Terrorism	War & civil war	Country economic risk	Currency inconvertibility & transfer risk	Sovereign credit risk	Expropriation	Contractual agreement repudiation	Legal & regulatory risk
North America	5.2	3.9	2.5	3.5	2.2	1.9	2.2	4.8	3.4
South America	5.2	2.3	2.5	4.9	4.3	6.2	4.0	5.1	5.0
Asia Pacific	4.1	2.9	2.8	4.8	4.3	4.8	3.4	4.4	4.9
Europe	4.0	2.7	2.1	4.1	2.5	3.1	2.2	3.8	3.3
Eastern Europe and Central Asia	5.2	3.6	4.7	6.0	5.8	6.5	6.4	6.0	5.8
Middle East and North Africa	5.5	5.5	4.5	5.1	4.9	5.6	4.9	5.7	5.7
Sub-Saharan Africa	5.5	4.3	3.9	5.8	5.8	6.9	5.3	5.8	6.1
World average	4.9	3.4	3.1	5.0	4.4	5.3	4.0	5.0	5.0

Region	Averages and changes					
	Average of security perils	3-Year deterioration (2023-2020)	Average of trading perils	3-Year deterioration (2023-2020)	Average of investment perils	3-Year deterioration (2023-2020)
North America	3.9	5.4%	2.5	9.2%	3.5	4.8%
South America	3.3	1.2%	5.1	4.6%	4.7	0.1%
Asia Pacific	3.3	3.4%	4.6	12.1%	4.2	1.2%
Europe	2.9	5.0%	3.2	10.2%	3.1	5.7%
Eastern Europe and Central Asia	4.5	11.8%	6.1	13.7%	6.1	6.2%
Middle East and North Africa	5.2	-1.7%	5.2	4.5%	5.4	-0.9%
Sub-Saharan Africa	4.6	3.2%	6.2	5.9%	5.7	-0.1%
World average	3.8	2.8%	4.9	7.9%	4.7	1.2%

Marsh's risk ratings are generated monthly by a proprietary, algorithm-based modelling system incorporating over 200 international indices across 197 countries. For each peril, countries are scored on a scale from 0.1 to 10.0, with intervals of one decimal; 0.1 represents the lowest risk score, 10.0 the highest. Five risk bands are identified within the scale, correspond to distinct risk environments.

HIGH RISK — LOW RISK

8.1–10.0	6.1–8.0	4.1–6.0	2.1–4.0	0.1–2.0

Source: Marsh

Ratings current as of February 2023.

04| **Political risk ratings for countries facing high debt/GDP ratios and risk of unrest**

Country	Security environment			Trading environment			Investment environment		
	Strikes, riots, & civil commotion	Terrorism	War & civil war	Country economic risk	Currency inconvertibility & transfer risk	Sovereign credit risk	Expropriation	Contractual agreement repudiation	Legal & regulatory risk
Argentina	7.4	2.9	2.0	7.4	7.8	8.3	4.7	5.5	5.5
Bangladesh	7.6	5.4	3.8	5.1	6.0	5.7	4.0	5.9	6.9
Egypt	4.5	5.9	4.7	5.9	6.2	6.6	4.6	4.9	5.9
Ethiopia	6.5	6.8	6.4	6.4	7.4	8.9	5.7	7.0	5.9
Kenya	6.4	6.9	3.5	5.3	5.9	6.7	4.5	5.4	5.7

From 2024 report on corruption Index. Note the Debt to GDP ratio (same as ICRG ratings)

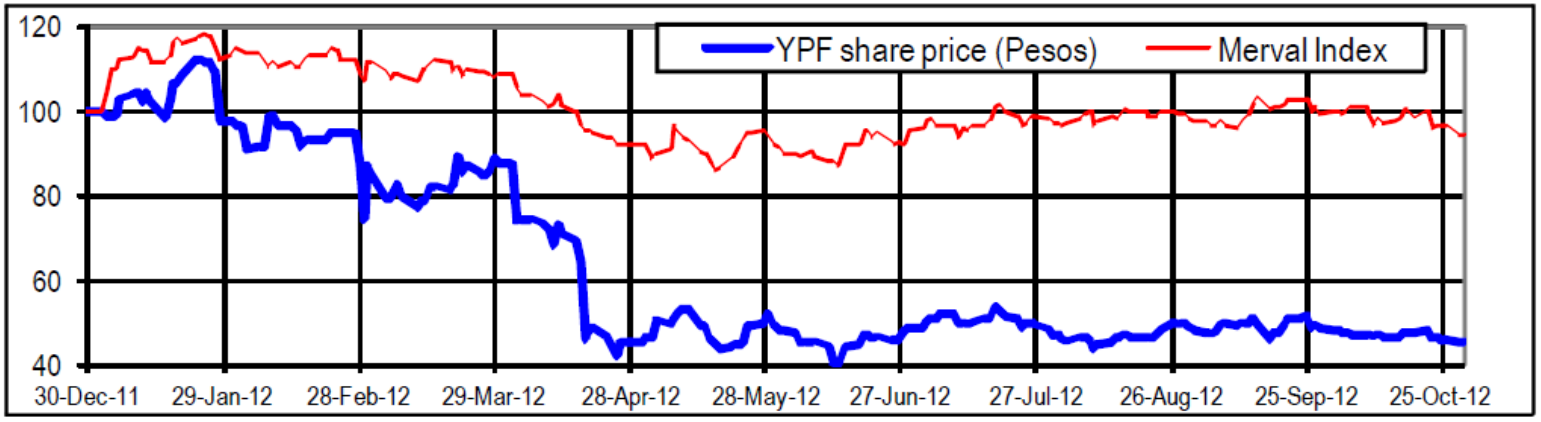
Argentina's expropriation of Repsol's YPF stake anticipated by country risk experts

Tuesday, April 17, 2012, Euromoney

The push to re-nationalize YPF represents one of the more dramatic shocks to confront foreign investors.

In the comedy of economic errors that has blighted Argentina under president Cristina Fernández de Kirchner's administration, Monday's push to re-nationalize YPF, the country's biggest oil company – expelling Spain's Repsol as majority shareholder – represents one of the more dramatic shocks that has confronted foreign investors in recent years…

Figure 2. Evolution of the YPF share price compared with the Merval Index in 2012. December 2011 = 100.
Source: Datastream



Hedging Political Risk

1. Take conservative approach:
   - Adjust NPV for political risk.
   - Political risk may be diversifiable to some extent.
     - Don't put all your eggs in one basket.
2. Minimize exposure to political risk:
   - Joint Venture
   - Consortium of international companies
   - Use local debt
3. Purchase insurance:
   - Private insurance (Lloyd's of London, AIG)
   - Government export credit agencies (OPIC in the US and EFIC in Australia)

BUSINESS | AUTOS INDUSTRY

Volkswagen Prepares for a Deglobalized World

Car giant's new resilience strategy: shorter supply chains, less focus on China and more investment in the U.S.

BERLIN—For years, Volkswagen AG VOW3 0.57% ▲ thrived as a global company, building and selling its cars all around the world. But as war, health scares and trade disputes roll back decades of globalization, the German giant is changing its manufacturing approaches to adapt.

VW's resilience effort includes strategies to shore up access to components and raw materials and shorten supply chains to make its regional businesses less dependent on faraway suppliers, according to senior executives at the company.

Without the vast home market of its U.S. competitors, VW long ago bet on international markets for growth. Now the world's second-largest car maker, VW benefited like few other companies from decades of post-Cold War detente, falling import tariffs and just-in-time supply chains.

Yet as the world grows more turbulent, VW's international reach faces a test: Can such a global business endure as supply chains are strained by the global pandemic, the semiconductor shortage, rising raw-materials prices and new geopolitical fractures?

In February, when Russia invaded Ukraine, shutting down the country's economy, Volkswagen found itself without wiring harnesses—contraptions used to organize cables and connectors in a car—made in the Eastern European country, forcing it to halt production of electric vehicles at VW, Audi and Porsche, and stop production at its biggest German factory in Wolfsburg.

SHARE YOUR THOUGHTS

How quickly or deftly do you think VW can adapt to a deglobalized world? Join the conversation below.

As geopolitical tensions rise, members of VW's supervisory board now worry about VW's growing dependence on the Chinese market—its biggest, fastest-growing and most profitable.

Moved by the rapid succession of crises, VW directors and labor leaders say VW management should buttress the company's fragile international supply chain and step up investment in core Europe and U.S. markets to dilute the company's dependence on China.

"We're not saying they should shrink in China but we're saying they should focus on other markets too," said a supervisory board member.

Murat Aksel, VW's purchasing chief, is restructuring how the company sources parts and materials and began monitoring each supplier—and these suppliers' suppliers.

"The chip crisis showed us that we have to be involved with the entire supply chain," he said.

Production stoppages caused by Russia's invasion of Ukraine and the loss of Chinese components during the pandemic exposed how VW could no longer focus solely on obtaining the cheapest parts, however remote or scattered their producers.

Now, Mr. Aksel said, VW is making the uninterrupted delivery of parts a priority over competitive pricing, and could accept dual sourcing of some components, a practice that the industry gave up years ago in favor of single sourcing components and just-in-time delivery.

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Why Should We Care About Barriers?

- If investment barriers are severe in a country, it will lead to that country's capital market being segmented (i.e., ***not*** integrated with the global capital market)
  - This will affect *investors* because it restricts their opportunities to diversify.
  - This will affect *firms* because it will keep their cost of capital higher relative to an integrated market.
- The issues with integration are:
  - How to quantify it?
  - Is it time-varying?

Estimating the Cost of Capital

- The Weighted Average Cost of Capital/Discount Rate/Hurdle Rate
  - The opportunity cost of investing capital in projects of similar risk and duration.

$$WACC = E(r_e) \times \frac{E}{V} + E(r_d)(1-\tau)\frac{D}{V}$$

- The Cost of Equity given by the CAPM

$$E(r_e) = r_f + \beta_e\left(E(r_M) - r_f\right)$$

r_f = the risk-free rate; $\beta_e = \frac{cov(r_e, r_m)}{var(r_m)}$

$E(r_m) - r_f$ = the market risk premium

Estimating the Cost of Capital

- The predictions of CAPM:
  - All investors hold the same portfolio of assets (i.e., market portfolio);
  - Risk premium on the market depends on the average risk aversion ($\overline{A}$) of all market participants i.e., $E(r_M) - r_f = \overline{A}\sigma_M^2$
  - Risk premium for the individual security is a function of its covariance with the market portfolio

- To estimate the CAPM:
  - We need data on returns on equity, return on the market portfolio and interest rate on risk-free asset
  - Obtain an estimate of β_e
  - Determine the market risk premium

CAPM: The Various Models

- **Domestic CAPM**

$$E(r_i) = r_f + \beta_e^{Domestic}\left(r_M^D - r_f\right) \quad \beta_i = \frac{cov(r_i, r_M^D)}{var(r_M^D)}$$

- Substituting the definition of beta into the cost of capital formula we get

$$E(r_i) = r_f + Cov\left(r_i, r_M^D\right)\frac{\left[E\left(r_M^D\right) - r_f\right]}{Var\left(r_M^D\right)}$$

Price of covariance risk

- **World CAPM**

$$E(r_e) = r_f + \beta_e^{World}\left(r_M^W - r_f\right)$$

$$\beta_e^W = \frac{cov(r_i, r_m^W)}{var(r_m^W)}$$

Examples of world market index are MSCI World Index

Applying the CAPM

- From the capital raising firms' point of view, the cost of capital should be lower due to globalization. Why?
  - As investors become better diversified, they require a smaller risk premium for capital.
- Stulz (1995) determines the cost of (equity) capital for Nestlé.*
  - Which market portfolio? The options are the Swiss Market Index or the World Market Index

The Cost of Capital of Nestlé

Domestic CAPM	International CAPM
$E(r_{Nestle}^{SWISS}) = r_f + \beta_{Nestle}^{SWISS}[E(r_{Home}) - r_f]$	$(r_{Nestle}^{World}) = r_f + \beta_{Nestle}^{World}[E(r_{World}) - r_f]$
$= 4.5\% + 0.885 \times (9.8\% - 4.6\%) = 9.1\%$	$= 4.5\% + 0.585 \times (5.4\%) = 7.7\%$

Note: Stulz assumes $[E(r_{World}) - r_f]$ of 5.4%

Getting the Benchmark Wrong

- Suppose the "***true***" cost of capital is estimated relative to the "world" market index: **7.7%**
- Instead, I use the "domestic" cost of capital to estimate Nestlé's cost of capital: **9.1%**
- How large is the error likely to be?
  - First, estimate expected return of the home market (i.e., Swiss market) on the World market portfolio.

$$E(r_{Home}) = r_f + \beta_{Home}^{World}\left[r_M^W - r_f\right]$$

  - Next, estimate the difference between the two costs of equity capital for Nestlé (domestic CAPM – world CAPM)

$$Error = \left(r_f + \beta_{Nestle}^{Home}\left[r_M^{Home} - r_f\right]\right) - \left(r_f + \beta_{Nestle}^{World}\left[r_M^W - r_f\right]\right)$$

$$= \left(\beta_{Nestle}^{Home} \times \beta_{Home}^{World} - \beta_{Nestle}^{World}\right)\left[r_M^W - r_f\right]$$

(1) (2)

Note: In the case of Nestlé, home = Switzerland

Getting the Benchmark Wrong (2)

- Assuming β_{Home}^{World} of 0.737

$$The\ error\ in\ \text{beta} = \left(\beta_{Nestle}^{Home} \times \beta_{Home}^{World} - \beta_{Nestle}^{World} \right) \quad (1)$$

$$= (0.885 \times 0.737) - 0.585 = 0.067$$

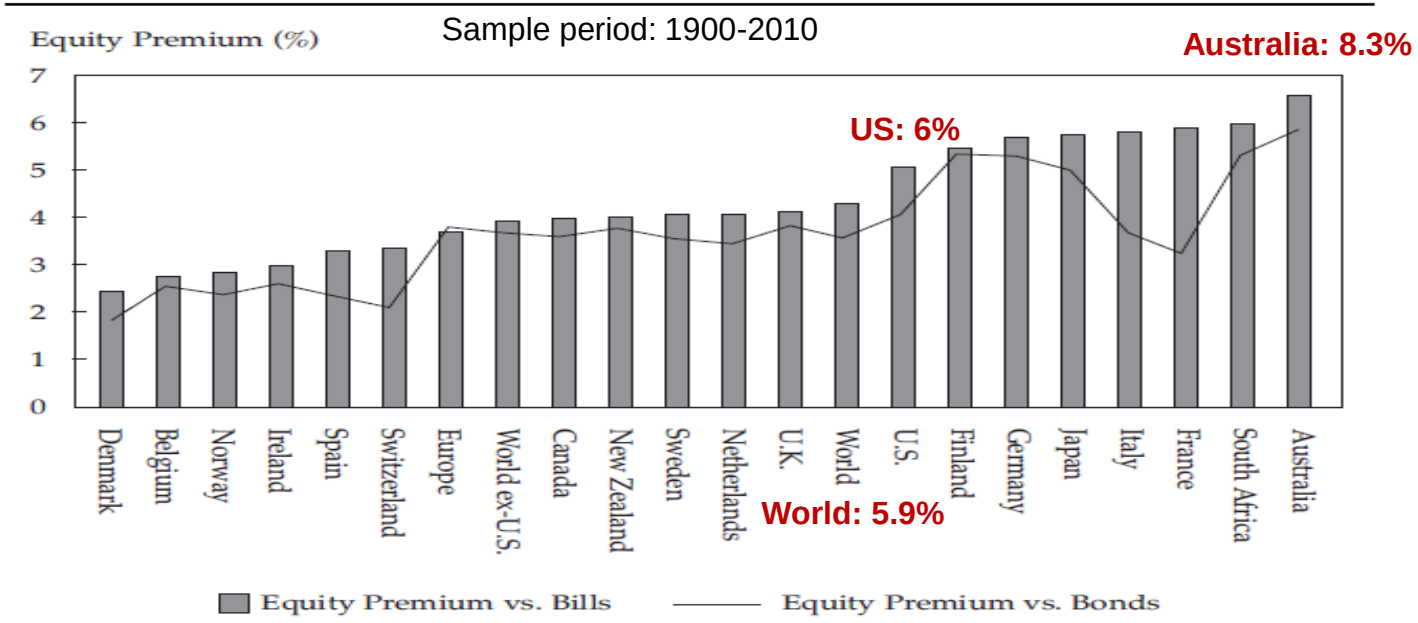
- Stulz assumes an excess return on the world market portfolio, $E(r_M^W) - r_f$, of 5.4%. (2)

$$The\ Error = 0.067 \times 0.054 = 0.0036 = 0.36\%$$

- Using the domestic CAPM would mean that the expected return for Nestlé is 0.36% ***higher*** than it should be.

The Risk-Premium

- It is the amount by which the expected return on the market exceeds the risk-free rate (i.e. $E(r_M) - r_f$).
- Most common approach is to use historical estimates.



Note: Statistics for Germany are based on 109 years, excluding the hyperinflationary years of 1922–1923.
Source: Based on Dimson, Marsh, and Staunton (2002) and as updated in Dimson, Marsh, and Staunton (2011b).

- But are historical returns a good signal of ex-ante returns?

Revisiting the question

- Reframing the original question: Should the cost of capital of foreign projects be adjusted for political risk?
- Two ways to think about this:
  - Should expected cash flows be adjusted? OR
  - Do we alter the discount rate instead?

- Discount rate adjustment: If the risk of loss from political risk does ***not*** covary with the (world) market return, no adjustment is necessary. Adjust cash flows instead.
- Cash flow adjustment: Needs to incorporate the risks of expropriation, unexpected taxation etc. by estimating the probability of such events and then estimating probability weighted cash flows.