

Investment mistakes 2

What are shares?

The value of shares

Introduction to portfolio theory

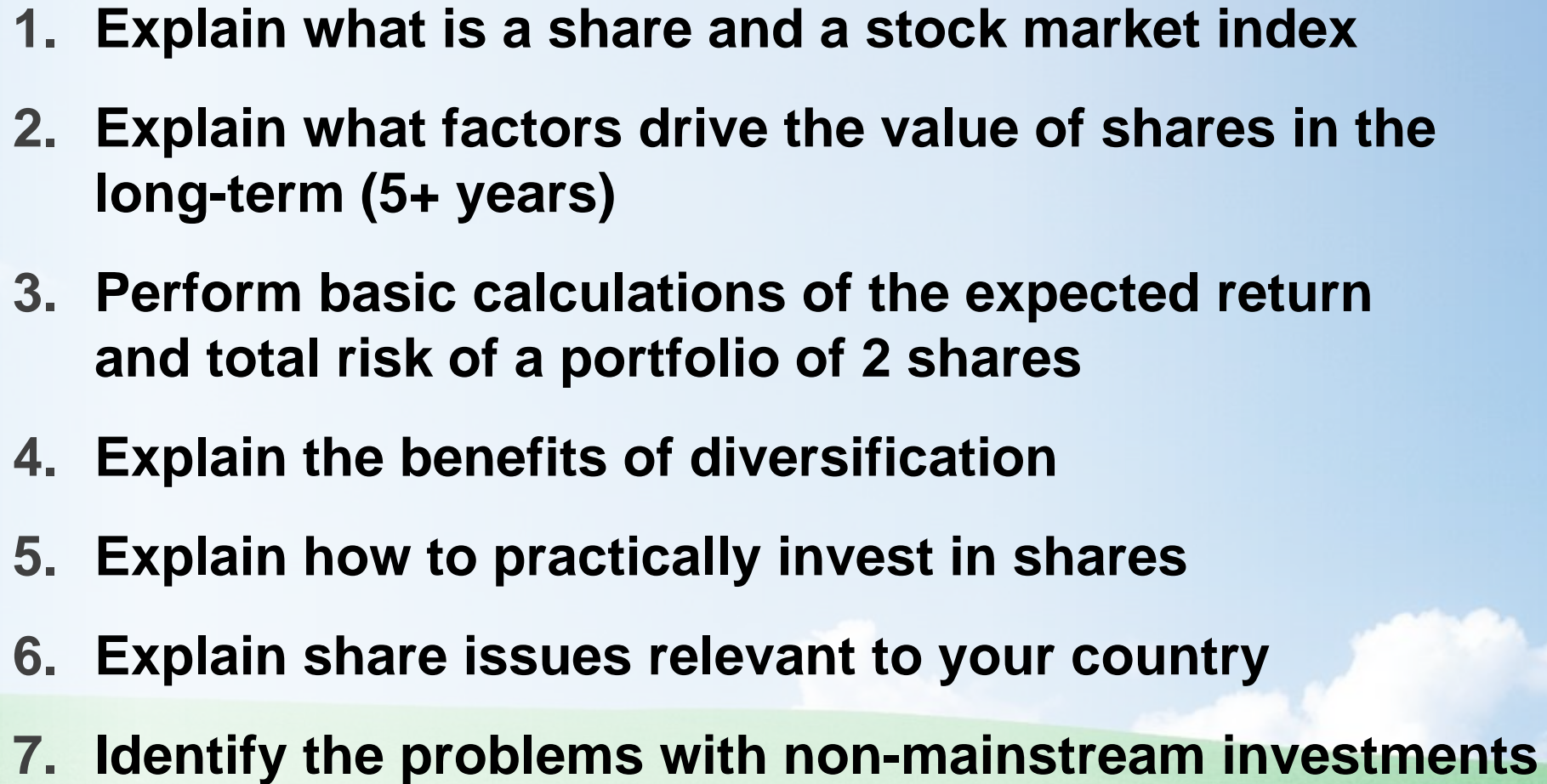
Investing in shares

Shares in Australia

Non-mainstream investments



You need to be able to ...

1. **Explain what is a share and a stock market index**
 2. **Explain what factors drive the value of shares in the long-term (5+ years)**
 3. **Perform basic calculations of the expected return and total risk of a portfolio of 2 shares**
 4. **Explain the benefits of diversification**
 5. **Explain how to practically invest in shares**
 6. **Explain share issues relevant to your country**
 7. **Identify the problems with non-mainstream investments**
- 

What are shares?



Think and discuss

If you asked most people whether they would prefer to invest \$100,000 in property or shares most people would say property.
Why do you think this is the case?



What are shares?

Represent part ownership of a company

With our personal finances ...

$$\text{Wealth} = \text{Assets} - \text{Debt}$$

With a company ...

$$\text{Equity} = \text{Assets} - \text{Debt}$$

Shares divide ownership of equity to different people

Shares are also called Stocks or Equities

What are dividends?

When a company makes a profit:

- 1. Part is retained by company to fund future projects**
- 2. Part is paid to shareholders as cash**

Profits paid out to shareholders is called a dividend

Usually paid every 6 months

Paid directly into your nominated bank account

Dividend yield = Dividend per year ÷ Share price

Usually between 0% and 5% per year

To what do shares entitle you?

If you own 1% of a company's shares ...

- 1. 1% of all future profits paid as dividends**
- 2. 1% of votes for who is on board of directors**
- 3. 1% of assets less debt if the company is bankrupt**
- 4. 1% of votes on 'special actions'**
- 5. The right to participate in share buy-backs**
- 6. 1% of value of shares if company is taken over**
- ~~7. You can sell your shares at a higher price in future NOT!~~**

Which of these are valuable to you?

Shares are listed on a Stock Exchange

You buy and sell shares on a Stock Exchange

... through a broker (usually online)

Some examples

United States: New York Stock Exchange and NASDAQ Stock Exchange (Tech)

United Kingdom: London Stock Exchange

Japan: Tokyo Stock Exchange

China: Shanghai Stock Exchange

Hong Kong: Hong Kong Stock Exchange

India: National Stock Exchange of India and Bombay Stock Exchange (Tech)

Australia: Australian Stock Exchange

Share markets are tracked with an index

A Stock Market Index tracks the average price gains (or losses) in a large portfolio of shares listed on a Stock Exchange

The ‘average’ is weighted by the value of shares in each company in the index so bigger companies have a bigger effect

Some examples

United States: S&P500, Dow Jones Industrial, NASDAQ Composite (Tech)

United Kingdom: FTSE 100

Eurozone: Euro STOXX 50

Japan: NIKKEI 225

China: Shanghai Composite Index

Hong Kong; Hang Seng Index

India: Nifty 50, SENSEX (Tech)

Australia: ASX200

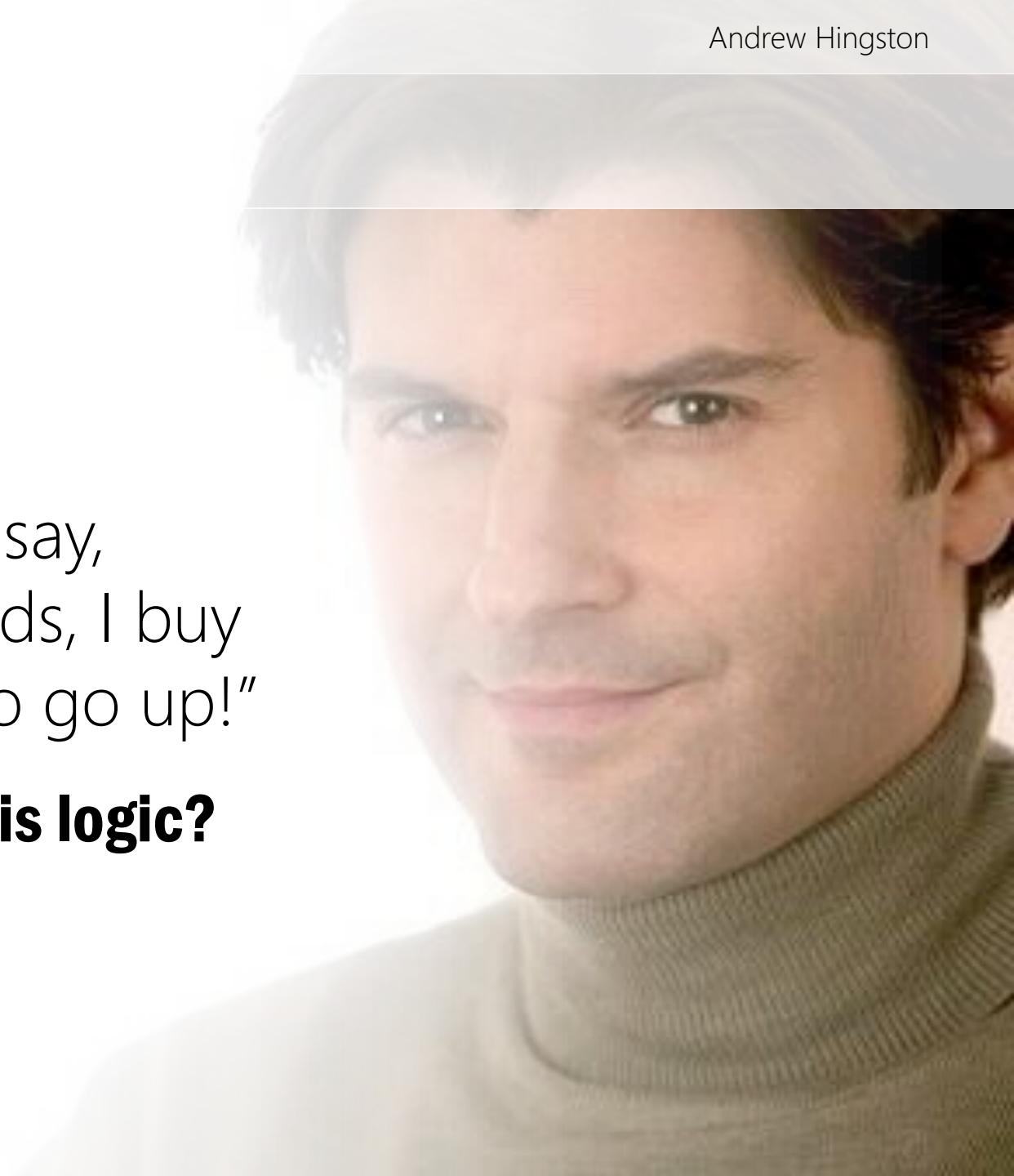
The value of shares



Think and discuss

Most people who invest in shares say,
“I don’t buy shares for the dividends, I buy
them because I expect the price to go up!”

Can you think of any problems with this logic?



How do we get our returns on shares?

Total return (7-10%) = Price gains (4-6%) + Dividend yield (3-4%)

Dividends come from the company's profits

Profit = Revenue – Expenses – Tax

Average is 3 - 4% (but varies between countries due to tax)

So where do the price gains come from?

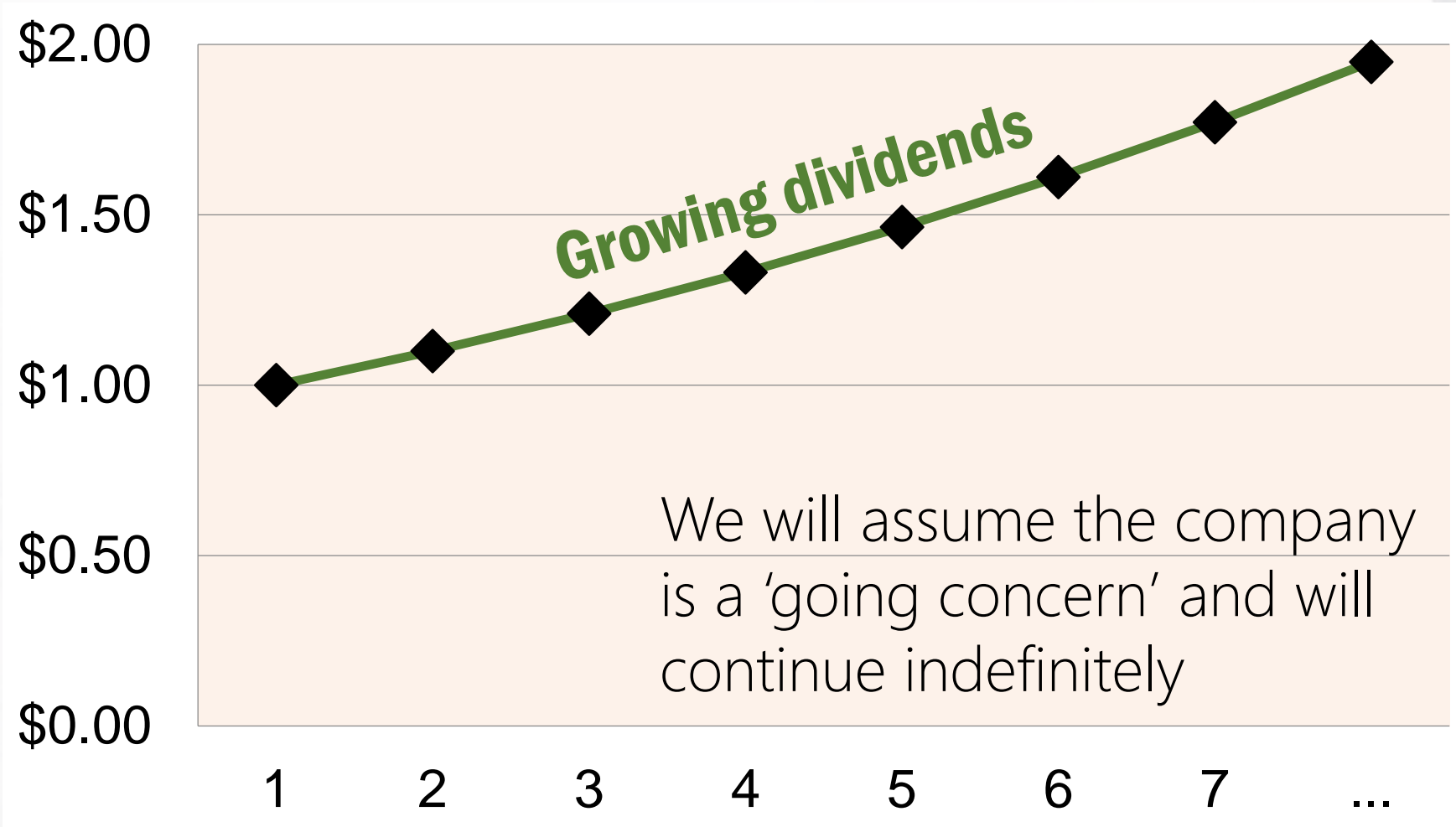


So where do these price gains come from?

1. All future profits paid as dividends – **YES**
2. Votes for who is on board of directors – NO
3. Assets less debt if the company is bankrupt – NO
4. Votes on 'special actions' – NO
5. The right to participate in share buy-backs – **YES, BUT SMALL**
6. Value of shares if company is taken over – **YES, BUT UNLIKELY**

In finance, we usually understand value by considering the present value of **all future dividends**

Dividends are expected to grow with profits

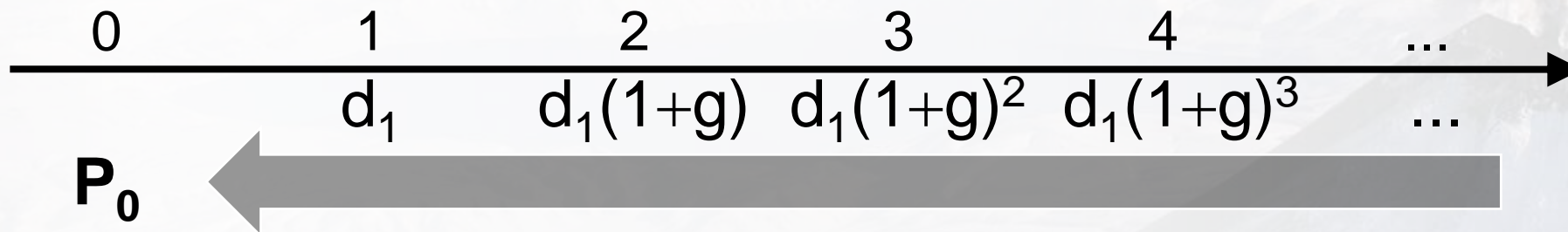


Valuing growing dividends as a perpetuity

The firm's next dividend is d_1

Dividends grow at $g\%$ per period forever

Value as growing perpetuity



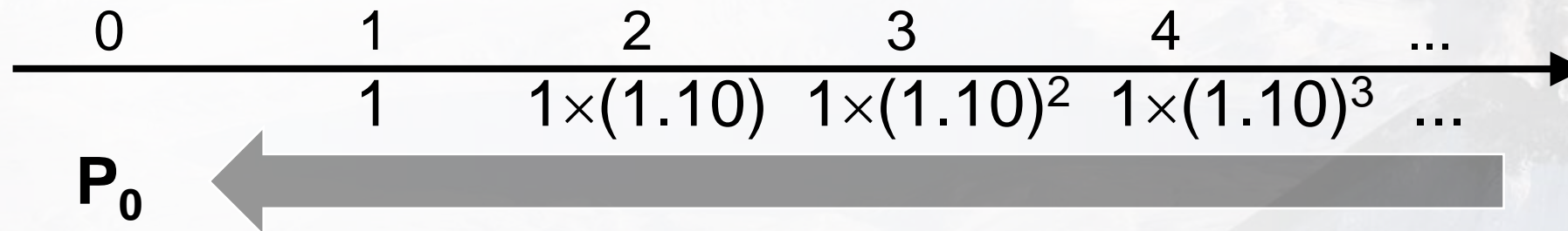
$$P_0 = \frac{d_1}{(r_e - g)}$$

is the same formula
as a growing
perpetuity

$$A_{\infty, g} = \frac{R_1}{(r - g)}$$

Example of growing dividends

How much should Susan pay for a share that will pay a dividend of \$1 in one year growing at 10% forever if she requires the share to earn 12% per year?

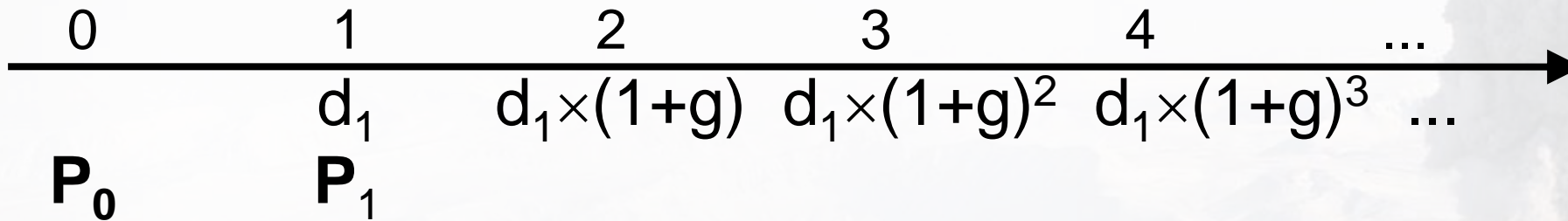


$$P_0 = \frac{d_1}{(r_e - g)} = \frac{1}{(0.12 - 0.10)} \quad \text{calculator icon} \quad 1 \div (.12 - .10) =$$

$$= 50.00$$

The share price is also expected to grow by 'g'

If dividend grows by g% in perpetuity then so will the stock price!



Algebra tells us why ...

$$P_0 = \frac{d_1}{(r_e - g)}$$

$$P_1 = \frac{d_1(1+g)}{(r_e - g)} = \frac{d_1}{(r_e - g)} \times (1+g) = P_0 \times (1+g)$$

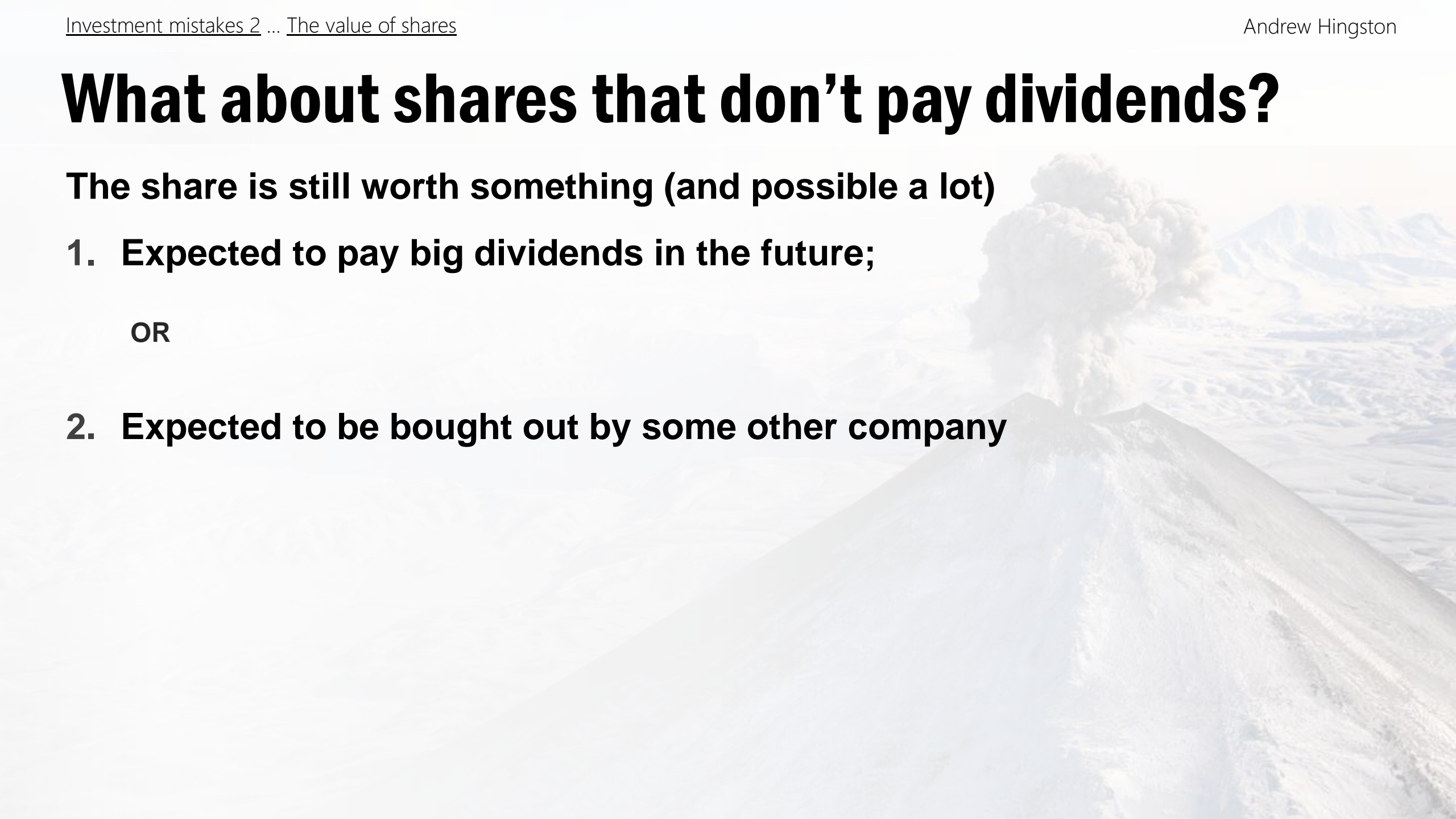
What about shares that don't pay dividends?

The share is still worth something (and possible a lot)

1. Expected to pay big dividends in the future;

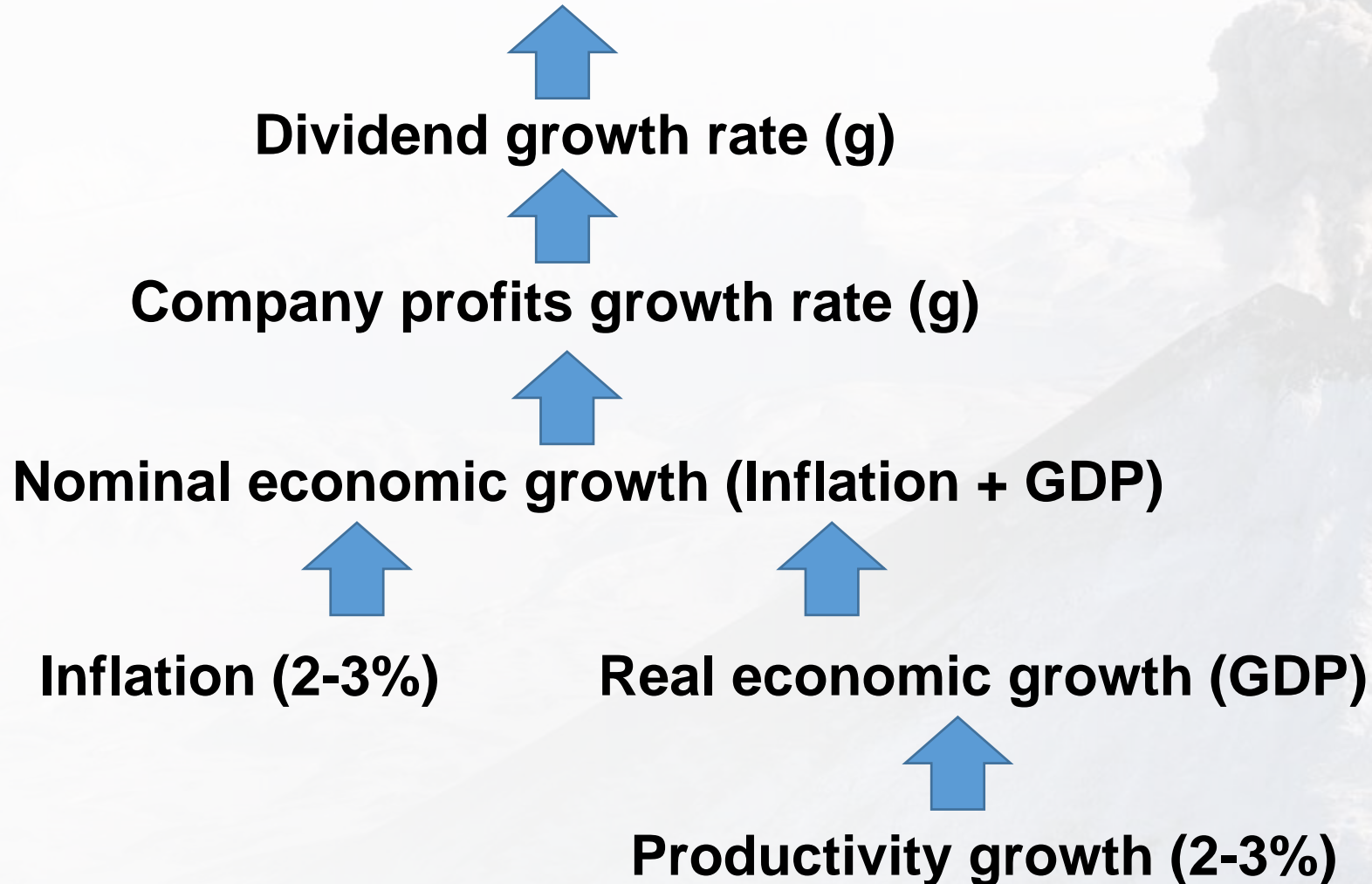
OR

2. Expected to be bought out by some other company



What drives returns on the average share?

Total return (7-10%) = Price gains (4-6%) + Dividend yield (3-4%)



What drives the returns on a particular share?

According to the Capital Asset Pricing Model ...

1. Interest rates

Expected returns on shares must be higher than interest rates

2. The returns on an average share (Market Index)

See previous slide ... inflation and productivity growth
... influenced by the domestic and world economy

3. Sensitivity of the share to the economy

Systematic risk (beta)

4. Information specific to that company or industry

See: http://en.wikipedia.org/wiki/Capital_asset_pricing_model

Some implications from understanding value

- 1. There must be a sound reason why share prices go up**
- 2. Future dividends are more important than most people think**
- 3. Price growth comes from expected future profit and dividend growth**
- 4. This is also what makes shares risky in the short term
... future growth is uncertain!**
- 5. For the average share, over the long-term, price gains should be
linked to inflation and productivity growth**
- 6. Total returns includes these price gains plus dividend yield**

Introduction to portfolio theory



Expected return of a portfolio of two shares

If we combine the shares of two companies into a portfolio then the expected returns on the portfolio is the weighted average of the two shares.

$$r_p = w_1 \times r_1 + w_2 \times r_2$$

Where:

r_p is the expected return on a portfolio of shares in two companies

r_1 is the expected return on the first share

r_2 is the expected return on the second share

w_1 is the proportion of the portfolio invested in the first share

w_2 is the proportion of the portfolio invested in the second share

$$w_1 + w_2 = 1$$

Example of expected return of portfolio

What is the expected return on a portfolio of two shares if the expected return of the first one is 7% and the second one is 12%. 40% of the portfolio is invested in the first share and 60% in the second.

$$r_p = w_1 \times r_1 + w_2 \times r_2$$

$$r_p = 0.4 \times 7 + 0.6 \times 12$$

$$r_p = 10\%$$

Total risk of a portfolio of two shares

If we combine the shares of two companies into a portfolio then the total risk (σ sigma) of the returns is always less than the weighted average of the standard deviations of each share.

The formula for the combined total risk is as follows:

$$\sigma_p = \sqrt{w_1^2 \times \sigma_1^2 + w_2^2 \times \sigma_2^2 + 2 \times w_1 \times w_2 \times \rho \times \sigma_1 \times \sigma_2}$$

Where:

σ_p is the standard deviation (total risk) on a portfolio of shares in two companies

σ_1 is the standard deviation (total risk) of returns of the first share

σ_2 is the standard deviation (total risk) of returns of the second share

w_1 is the proportion of the portfolio invested in the first share

w_2 is the proportion of the portfolio invested in the second share

ρ (rho) is the correlation in returns between the two shares

Example of total risk of portfolio

What is the standard deviation on a portfolio of two shares if the standard deviation of the first one is 20% and the second one is 30%. The correlation (ρ) between the two shares is 0.5. 40% of the portfolio is invested in the first share and 60% in the second.

$$\begin{aligned}\sigma_p &= \sqrt{w_1^2 \times \sigma_1^2 + w_2^2 \times \sigma_2^2 + 2 \times w_1 \times w_2 \times \rho \times \sigma_1 \times \sigma_2} \\ &= \sqrt{0.4^2 \times 20^2 + 0.6^2 \times 30^2 + 2 \times 0.4 \times 0.6 \times 0.5 \times 20 \times 30} \\ &= 23.1\%\end{aligned}$$

The weighted average of standard deviations is 26%

$$0.4 \times 20 + 0.6 \times 30 = 26\%$$

The benefit of diversification

Expected returns

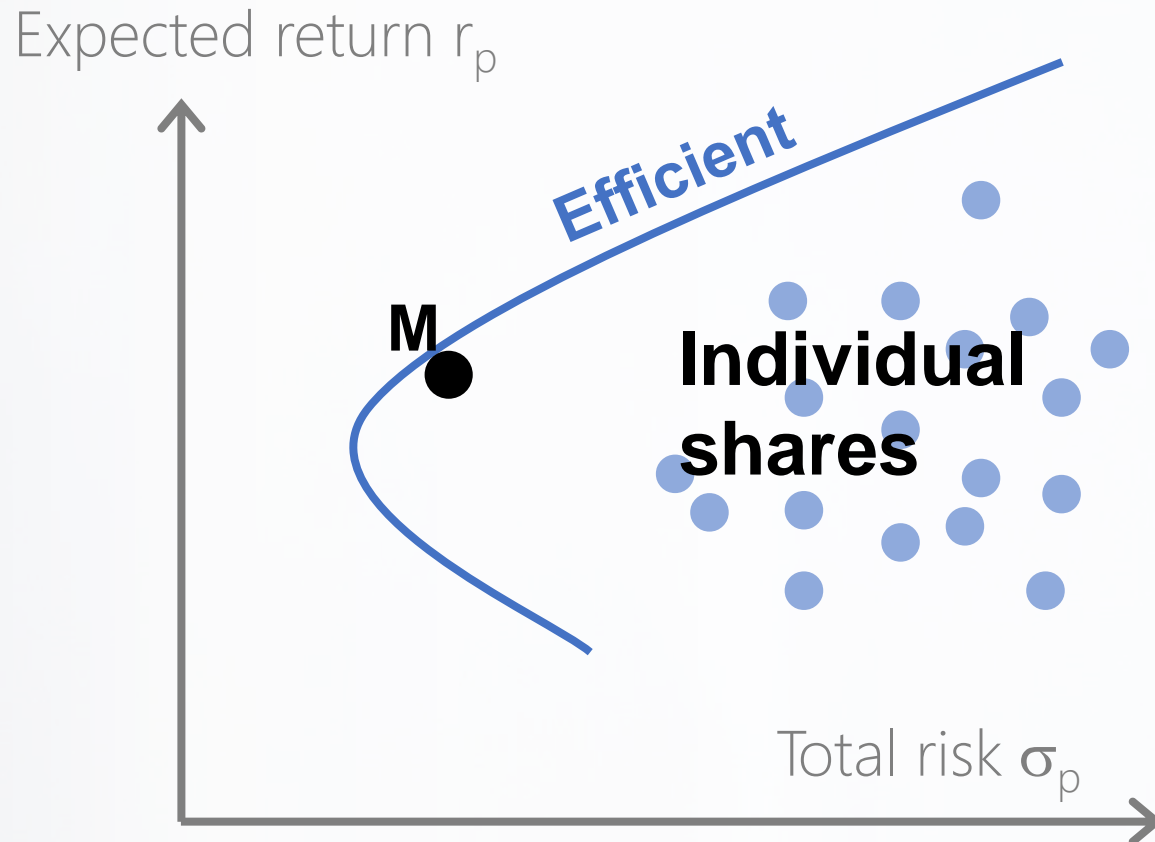
The expected return on a portfolio of shares is always equal to the weighted average of the shares

Total risk

The standard deviation on a portfolio of shares is always less than the weighted average of the shares

Diversification is powerful way to reduce total risk without necessarily reducing expected returns

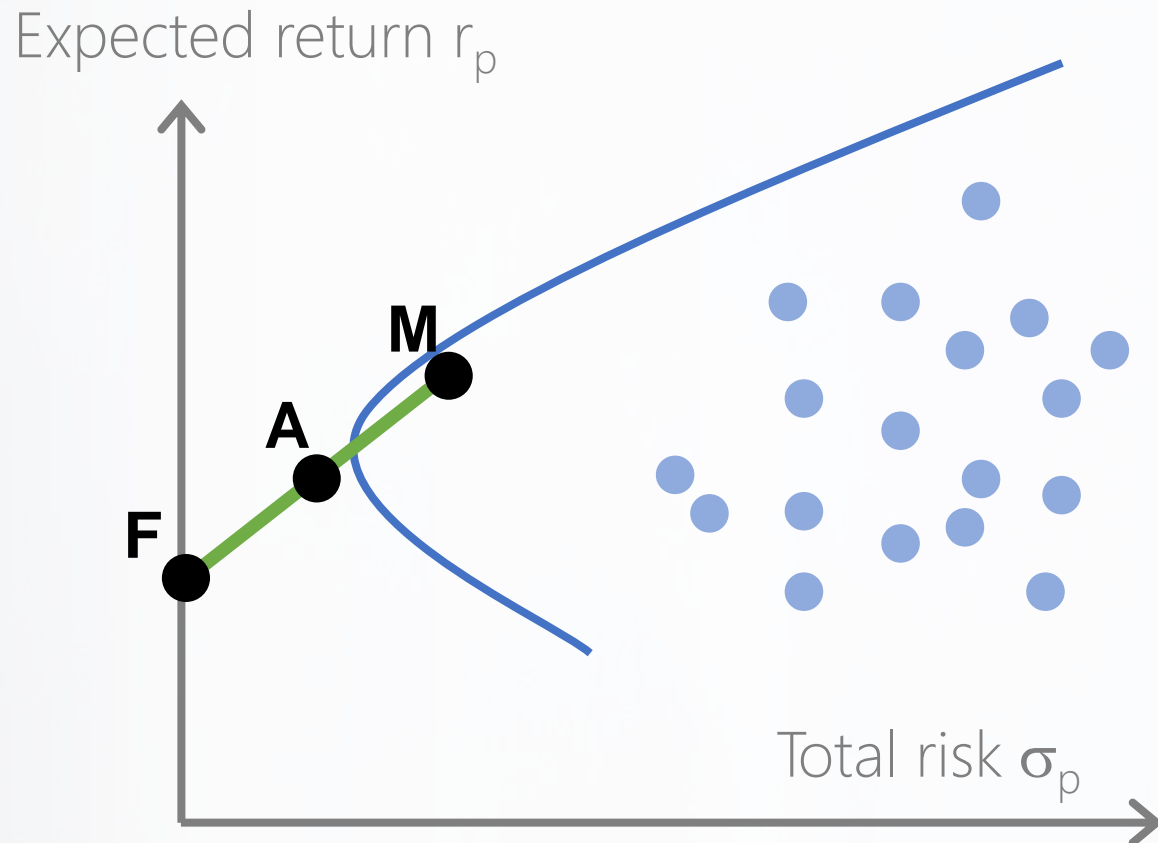
Diversifying across many shares



Efficient portfolios have highest expected return for a given total risk

The Market Index (M) is usually a pretty good mix of risk and return

Combining the Market Index with Fixed Interest



Investing \$1,000

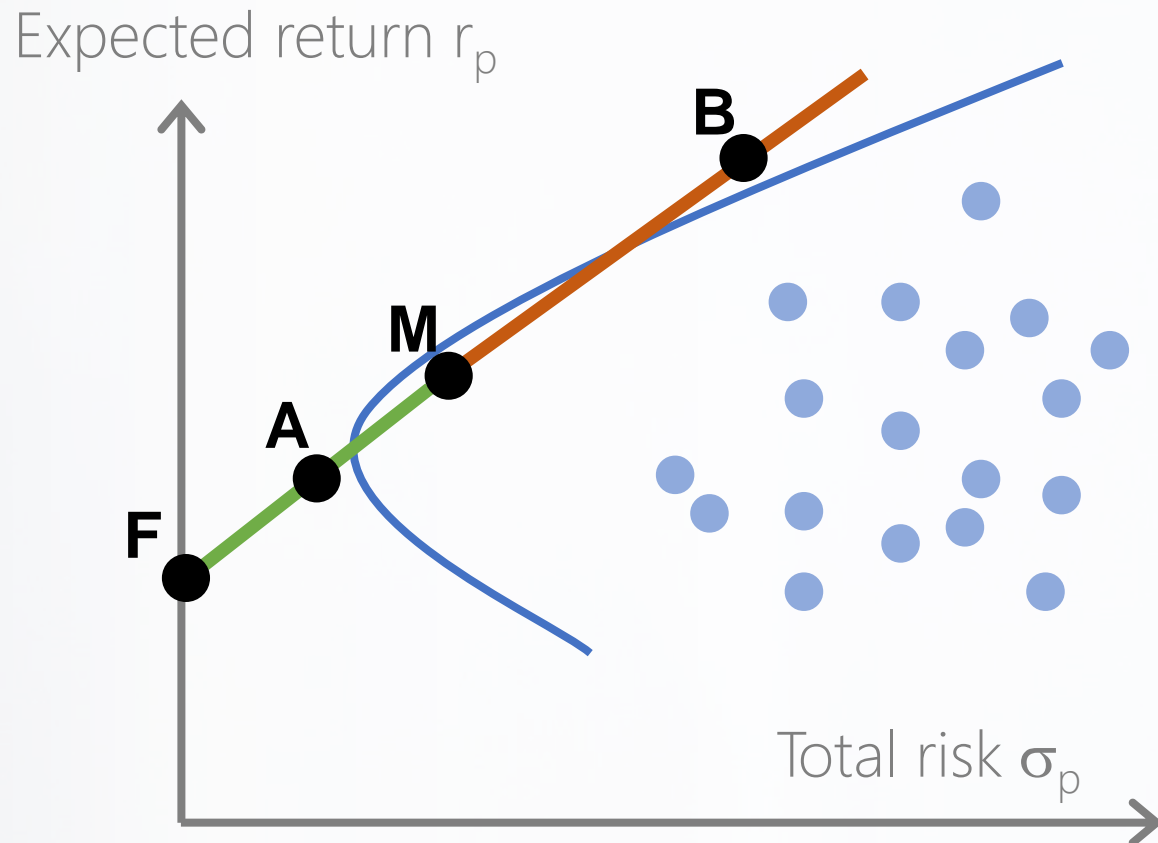
(F) \$1,000 in Fixed Interest

(M) \$1,000 in Market Index

**(A) \$500 in Fixed Interest
\$500 in Market Index**

The technical name for this line is the 'Capital Market Line'

If you are willing to borrow to invest ...



Investing \$1,000

(F) \$1,000 in Fixed Interest

(M) \$1,000 in Market Index

**(A) \$500 in Fixed Interest
\$500 in Market Index**

**(B) Borrow \$1,000 at Fixed rate
Invest \$2,000 in Market Index**

The technical name for this line is the 'Capital Market Line'

Some implications from portfolio theory

1. Both expected return and risk need to be considered
2. Diversification reduces total risk
... without necessarily reducing expected returns
3. A broad Market Index often provides a pretty good trade-off between risk and return
4. Investing in a mix of Fixed Interest and the Market Index provides a moderate level of risk
5. Borrowing money to invest in the Market Index provides a better trade-off between risk and return than speculating on stocks and timing the market for those who are targeting much higher returns

Investing in shares



Buying shares directly

You buy and sell shares through a broker (usually online)

Fees are usually about \$10 to \$20 per transaction

But may be more on transactions above \$10,000

You must research companies thoroughly

You must consider both expected return and risk

You must diversify to reduce risk (usually 10 to 20)

Most investors underperform in either return or risk

Many investors slide into short-term speculative behavior

Trying to pick stocks and time the market

Mutual funds (managed funds)

Offered by banks and investment banks (fund managers)

A professionally designed portfolio of shares or fixed interest

... promoted through networks of financial advisers

Attempt to 'pick stocks' and 'time the market'

Management fees (usually 1% to 2% per year)

Entry fees (usually 0% to 4% of investment)

Usually pay ongoing commissions to financial advisers

A large choice of funds available (1,000s!)

Consistent outperformance in return and risk is debatable!

Exchange Traded Funds (ETFs)

They look like an ordinary share listed on a stock exchange

... but they track an index

You can achieve good diversification with just one share!

Very low fees compared to mutual funds (managed funds)

Pay no commissions to advisers (so they don't like them!)

Available for many different indices

**Broad Share Market Index, Tech Stocks Index, Small Companies Index
Resource Company Index, Fixed Interest Index, Commercial Property Index,
Commodity Price Index, Currency Index**

Less temptation to speculate (pick stocks or time the market)

Shares ... the good and the bad

The Good

Higher expected returns over the long run

Easy to diversify using ETFs

Low transaction fees

Divisible

Low chance of losing original investment if you are diversified and invest for the long-term

Good for long-term savings (5+ years)

The Bad

High uncertainty in returns (total risk) in short and medium term

Returns may be low if the economy suffers a long recession

Tempting to speculate by picking stocks and timing the market

More difficult than property to obtain a loan to invest

Shares in Australia



Australian Stock Exchange

Australian Stock Exchange (ASX) is our main exchange

Our main stock market index is the ASX200 index

Tracks price movements of the top 200 shares

The All Ordinaries is an older index that tracks top 500 shares

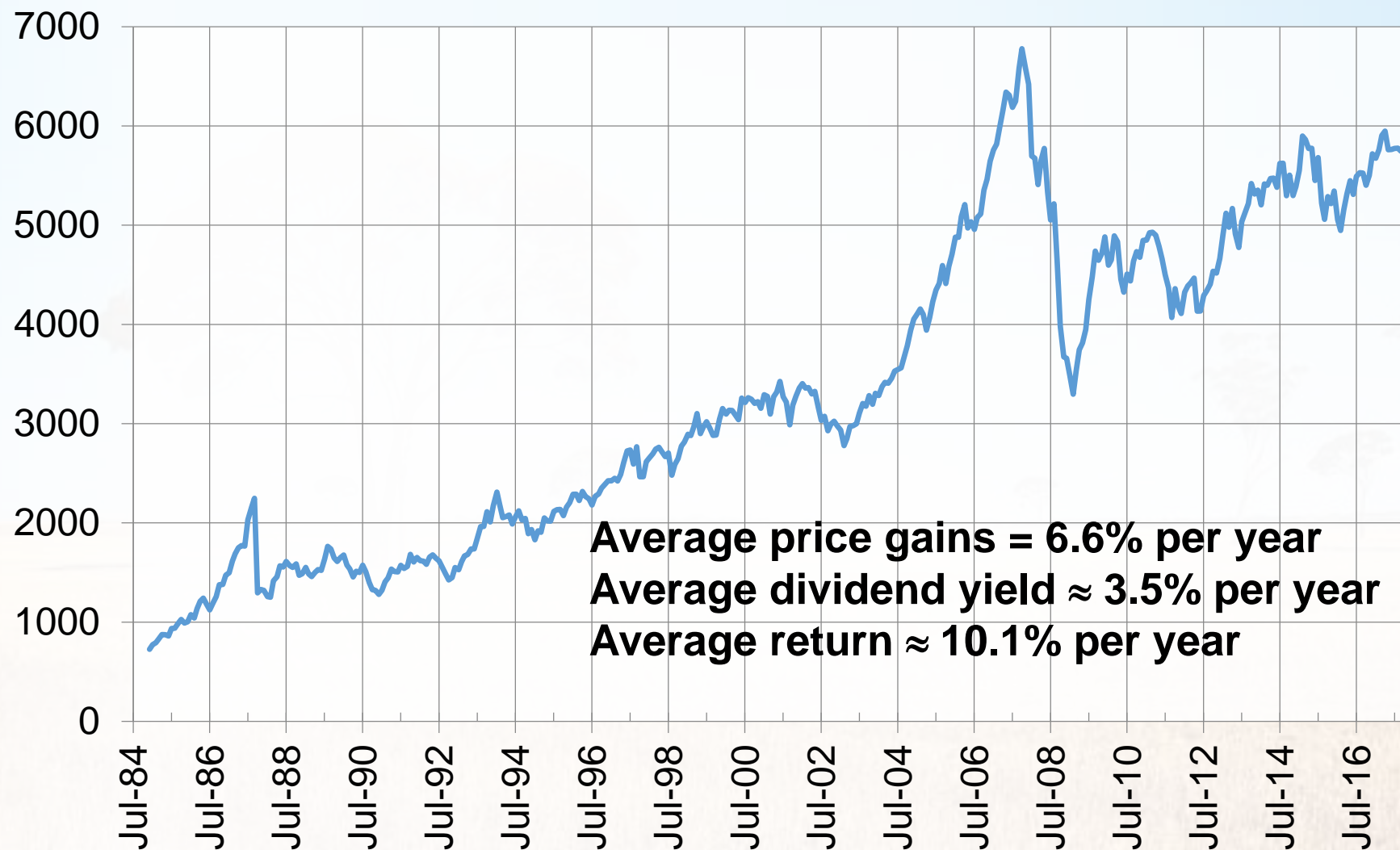
All transactions are cleared electronically

You don't trade on the exchange directly

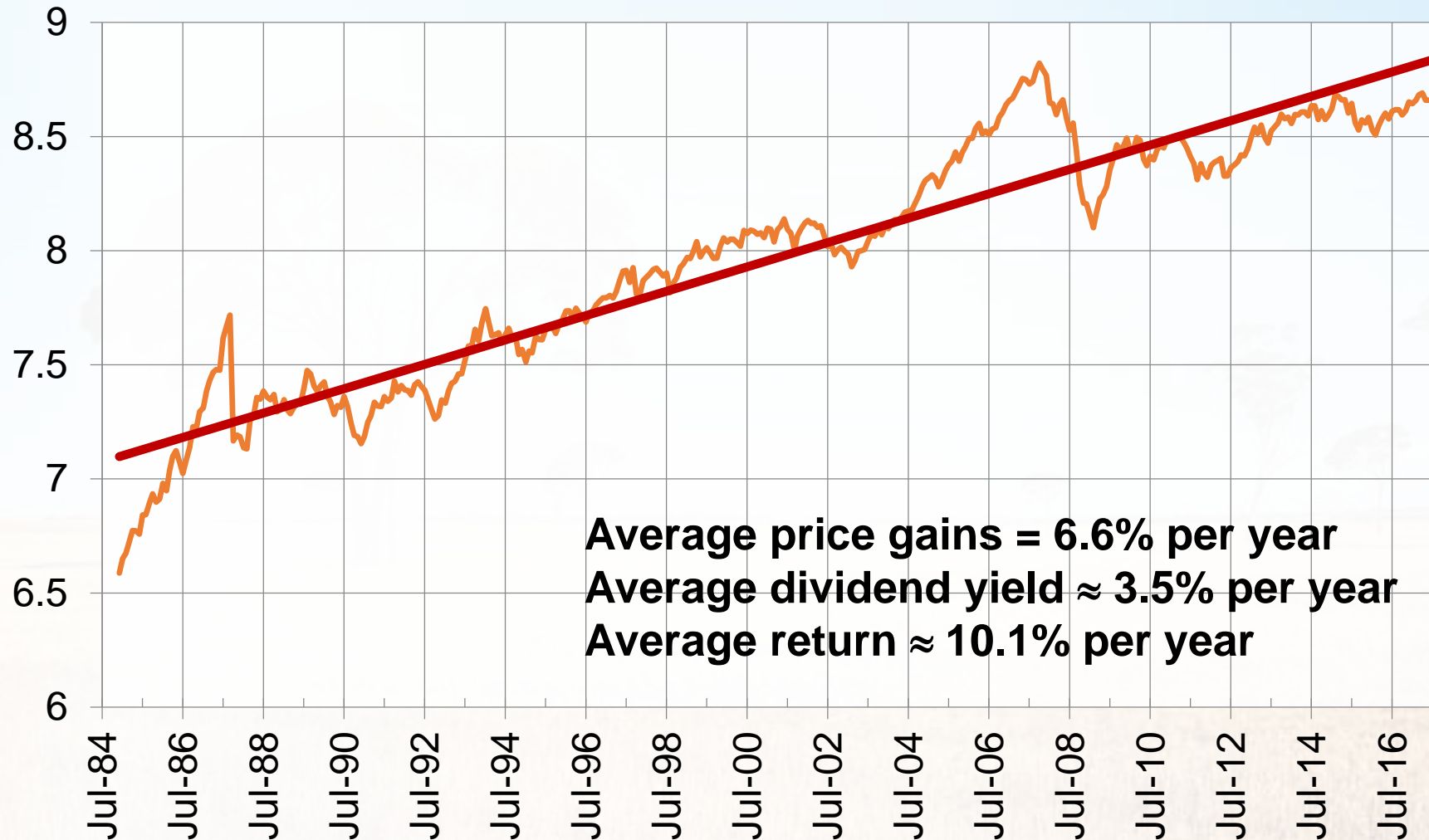
... you buy and sell shares through a broker

The largest broker is Commsec (Commonwealth Bank)

All Ordinaries (top 500 shares)



Log scale of All Ordinaries (top 500 shares)



Exchange Traded Fund for Australian Shares

StreetTRACKS ASX200 Fund (STW) is a fund that is listed on the stock exchange

Invests in the top 200 Australian companies listed on the stock exchange weighted according to their size.

Funds returns \cong ASX200 index returns

In practise ... slightly less due to costs of running the fund

Management Expense Ratio of only 0.286%

Well diversified share portfolio with only one stock!

Exchange Traded Funds for other things

Barclays also have iShare ETFs that track world indices.

They give you diversification across 50+ companies in those markets.

Value is affected by Australian Dollar which adds to risk

IOO – Global

IVV – United States

IEU – Europe

IEM – Emerging Markets

IZZ – China

IHK – Hong Kong

Dividend imputation

Companies pay 30% corporate tax on profits

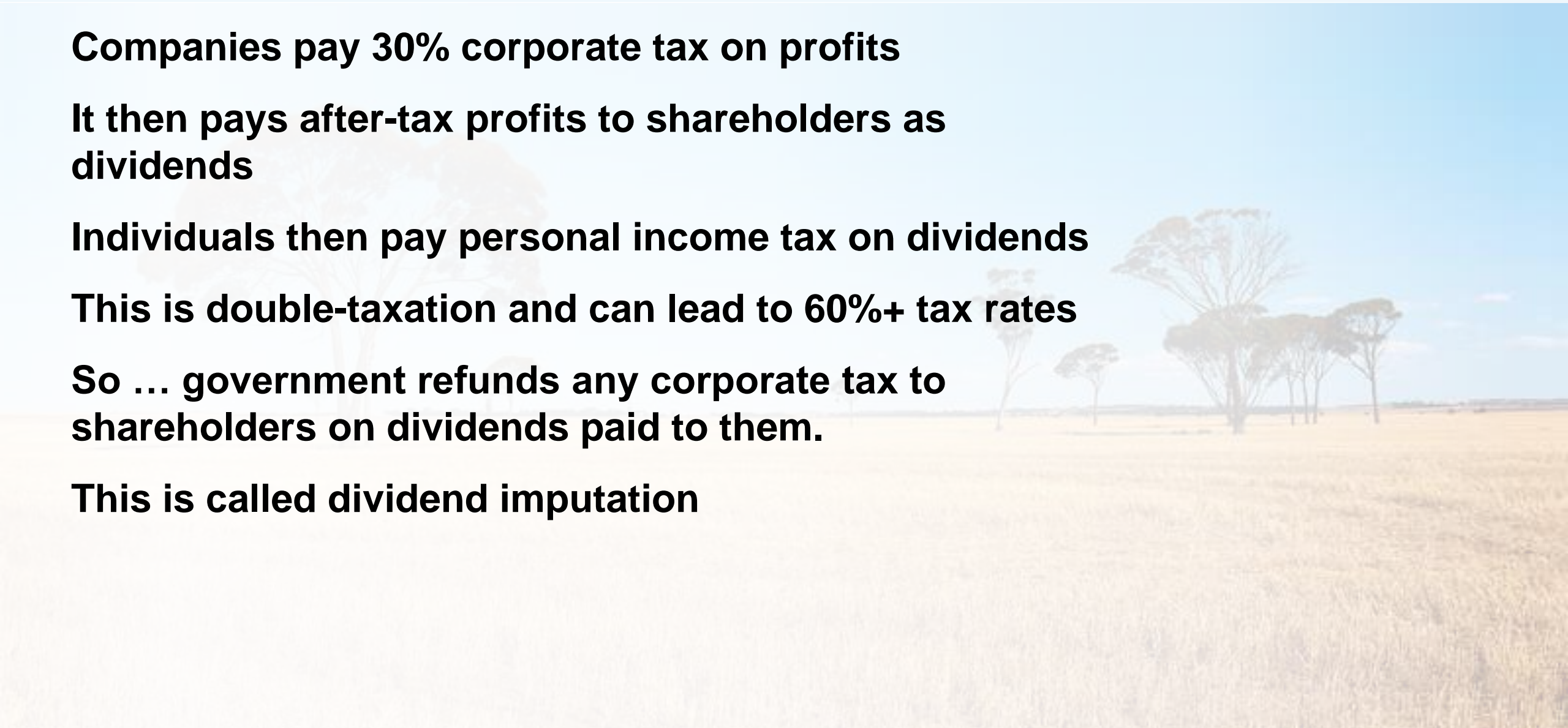
It then pays after-tax profits to shareholders as dividends

Individuals then pay personal income tax on dividends

This is double-taxation and can lead to 60%+ tax rates

So ... government refunds any corporate tax to shareholders on dividends paid to them.

This is called dividend imputation



Dividends at tax time

You receive a cash dividend of \$700

Dividend notice advises “franking credits” are \$300

You report your income as $\$700 + \$300 = \$1000$

Even though you only received \$700 in cash!

Calculate tax at your marginal rate (say 38.5%) = \$385

Report the “franking credit” as a tax rebate on tax return

You receive a tax rebate of \$300

You only pay an extra \$85 in tax

Total tax received by government is \$300 in corporate tax plus \$85 in personal income tax = \$385 = 38.5% tax

Capital gains at tax time

Cost price = Purchase price + brokerage fees

Disposal price = Sale price – brokerage fees

Gain = Disposal price – cost price

Add this gain to your assessable income

Taxed at your marginal rate of tax + medicare levy

If held shares > 1 year then only ½ of gain assessable

You only pay it when you sell the shares

... so invest for the long-term and defer tax indefinitely!

Non-mainstream investments



Recap of mainstream investments

1. Cash

Savings account

2. Fixed interest

Term deposits or CD
Fixed Interest ETF

3. Residential property

Home
Investment property

4. Commercial property

Commercial Property ETF

5. Domestic shares

Share Market Index ETFs

6. International shares

International Share Market
Index ETFs

Listed commercial property

Large trusts that invest in a diversified portfolio of commercial property listed on stock exchange

Office buildings, shopping centres, hotels etc.

Often called REITs or LPTs

REIT – Real Estate Investment Trust

LPT – Listed Property Trust

Receive regular rent ... so pay regular payments

But they often have a large amount of debt

In a financial crisis, they can become worthless quickly!

**BE
CAREFUL**

Listed investment companies (LICs)

**BE
CAREFUL**

Companies that invest in other companies listed on the stock exchange

Buying shares in that company gives you diversified portfolio of other companies

Like a mutual fund listed on stock exchange

Different from Exchange Traded Funds because LICs try to pick stocks and sectors rather than track an index

Derivatives

AVOID

“Created” financial instruments

ie. You don't really own anything physical

Their values are “derived” from other “real” assets

such as shares or commodities (gold, oil)

very exotic ones are based on anything with a number!!!

Normally used by large companies and financial institutions to hedge (reduce) risks that they face in the ordinary course of their business

Used by a small number of investors to gamble on changes in share prices (and other assets)

Examples include options, futures, warrants, CFDs ...

Futures

AVOID

Agree to buy / sell an asset at a future time for a set price

Make money as prices rise by buying futures

Make money as prices fall by selling futures

Requires no upfront payment

“Marked-to-market” daily and as prices move, you receive money or pay money from your account

Supposed to be used by companies to offset other risks

Gambling investors use them to make (and lose) lots of money quickly!

Contracts For Difference (CFDs)

AVOID

Offered by stockbrokers and derivative traders

Are similar to futures but there is no fixed term

Allow you to make a profit or loss from fluctuations in share prices without actually owning the shares

Investor pays/receives difference between the price of the share when CFD is opened and when it is closed

Receive all dividends on the shares

Only need to pay small proportion of value into account

Marked-to-market so you need to pay extra money if your position loses money

Options

AVOID

Call options

Give you the right, but not the obligation;
to buy a certain asset

at any time until a set date (Expiry date)

for a set price

at the cost of paying an upfront “premium”.

Make money when prices rise and lose upfront premium if prices fall

Put options

Similar but give you the right to *sell* the asset for a fixed price

Make money when prices fall and lose upfront premium if prices rise

Employee stock option plans (ESOPs) can be good!

Foreign exchange

AVOID

Some people speculate on exchange rate movements

This is called the 'carry trade'

Over 1-3 years then exchange rate movements influenced by relative interest rates

Over 3+ years then exchange rate movements influenced by a lot of factors including relative inflation rates, demand for exports and imports, attractiveness for foreign investments ...

Very difficult for professional hedge funds to pick the direction of exchange rates ... so don't try it!

Commodities

AVOID

Some people speculate on movements of the gold price and other commodities.

These are not investments since these assets generate no cash flow.

Their value is only 'in use' by demand and supply

Example of gold:

Demand for jewellery, electronics and store of wealth (dodgy)

Supply by gold mining companies, recycled gold and central banks

Gold price in the long-run should tend towards the cost of extraction (roughly US\$1,000 per ounce)

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