

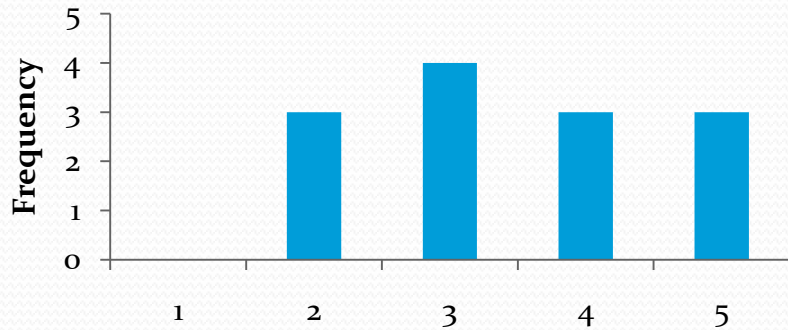
EC1800 ECONOMICS

Lectures 10-12

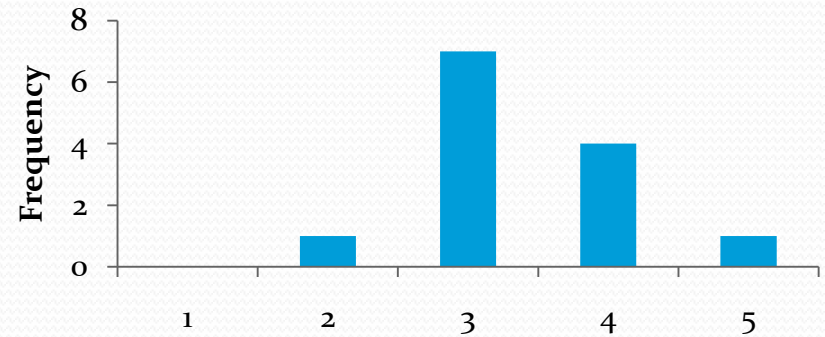
Mr. Niall Douglas MA BSc
NDouglas@bismail.ucc.ie

Last Week's Feedback Form Results

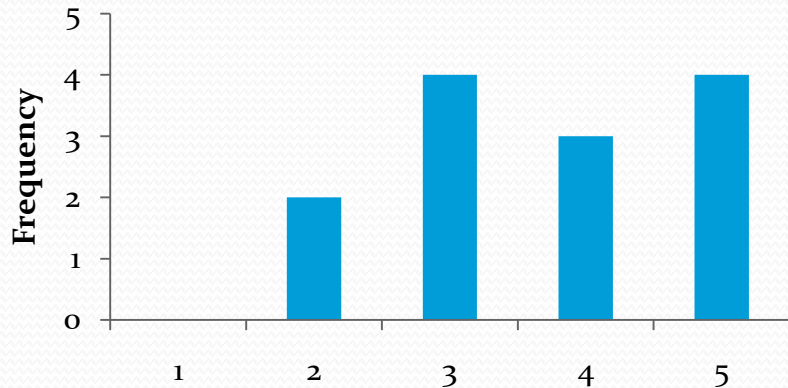
Boring/Interesting



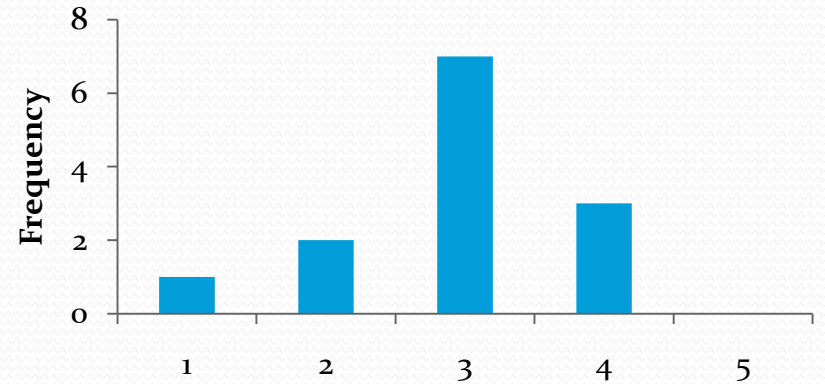
Slowly/Quickly



Confusing/Clear



Hard/Easy



Feedback So Far

Date	Boring/ Interesting	Slowly/ Quickly	Confusing/ Clear	Hard/ Easy	Average Hours Studied	Average Section 1 Mark	Average Section 2 Mark
11 th Nov	4.5	3.78	4.44	3.22	7.67	54.17%	58.30%
18 th Nov	4.5	3.75	4.08	2.92	4.1	79%	8%
25 th Nov	3.46	3.38	3.69	2.92	2.03		

Last Week I

- As was obvious from the comments on the Feedback Forms, last week's lecture was of poor quality & I was too exhausted to lecture well
- I apologise to the class though I cannot guarantee it will not happen again
 - It depends entirely on when the coursework falls. Last week a class test fell on a Tuesday afternoon so that left me no time. This week it was yesterday so I spent all today generating these slides

Last Week II

- Most of the negative feedback form comments were fair enough
- I have to say something about one comment which said that I kept saying last week that my studies are more important than yours
- I take exception to that:
 1. I invest over twelve hours a week in preparation for this class. It consumes all day Sunday, Monday night and most of Tuesday. Moreover, I could invest ZERO hours!
 2. A fair few hours of that is spent preparing questions which only a few of you bother to answer
 3. I have made significant personal sacrifices for this class

Last Week III

- Though this is none of your concern:
 1. I currently am doing TWO class tests and one 2,500 word essay EACH & EVERY week on top of fourteen hours of lectures & labs. Remember how exhausted you were with just one single 1,500 word essay!!!
 2. They are currently trying to throw me off my Masters because of missed classes caused by the prep for THIS class
 3. Relations between me & the girlfriend are strained because we haven't spent quality time together since THIS class began
 4. I collapsed from exhaustion last Wednesday and missed a mandatory 6pm-8pm assessment
- If you wish to believe that I am placing my studies before yours, well that's up to you

**What do you think?
Questions, Comments,
Concerns?**

**So what did you think
about the Reading?**

What We Covered Last Week I

Week 1: Types of Wealth

Week 2: Sustainability of Wealth

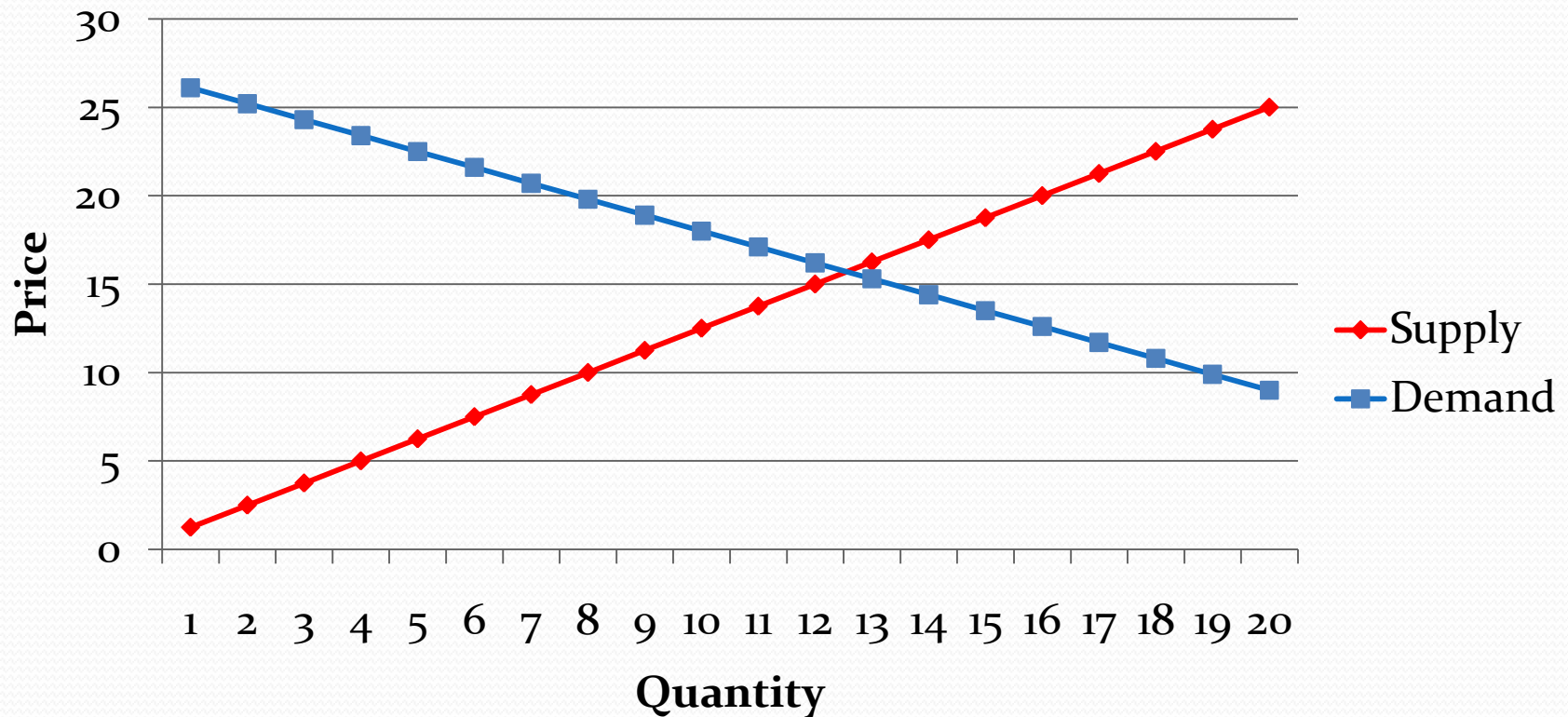
Week 3: Stability of Wealth 1

- a. General Equilibrium Theory
- b. Cartesian Mechanism
- c. The “Normal” Gaussian Distribution
- d. How the Gaussian Distribution works

This Lecture: Stability of Wealth 2

What We Covered Last Week II

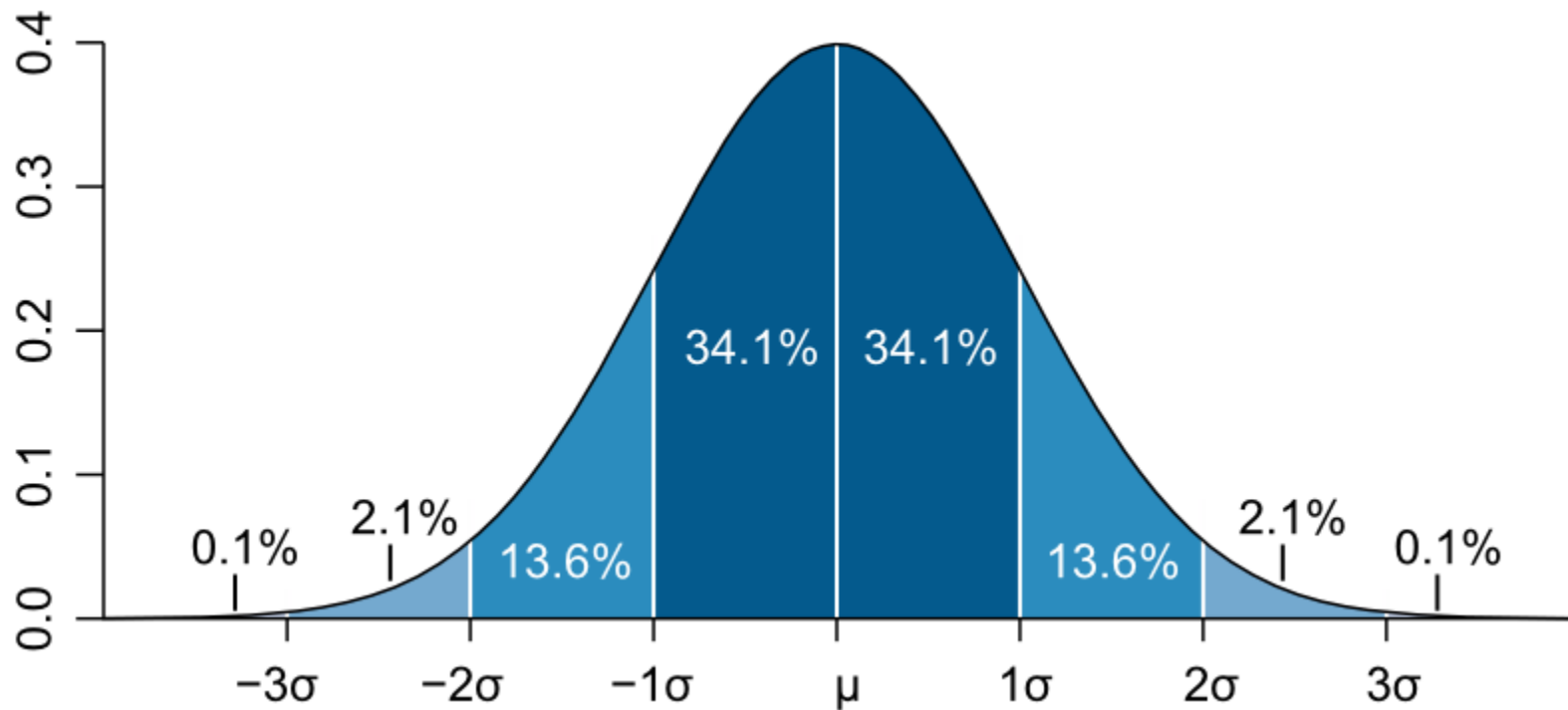
Demand & Supply of Flowers Arranged



What We Covered Last Week III

- Demand and Supply Curves
 - Where the two lines meet, you get *equilibrium price & quantity*
- The Western worldview: *Cartesian Mechanism*
 - Cartesian Mechanism is the worldview that the Universe is like a complicated machine
 - If a machine is too complicated to understand, you simply need to break it into smaller parts (called *reductionism*)
 - A machine is predictable, so if you observe how it behaves in the past, you can predict its future behaviour

The Gaussian Distribution (also called *the Bell Curve*)



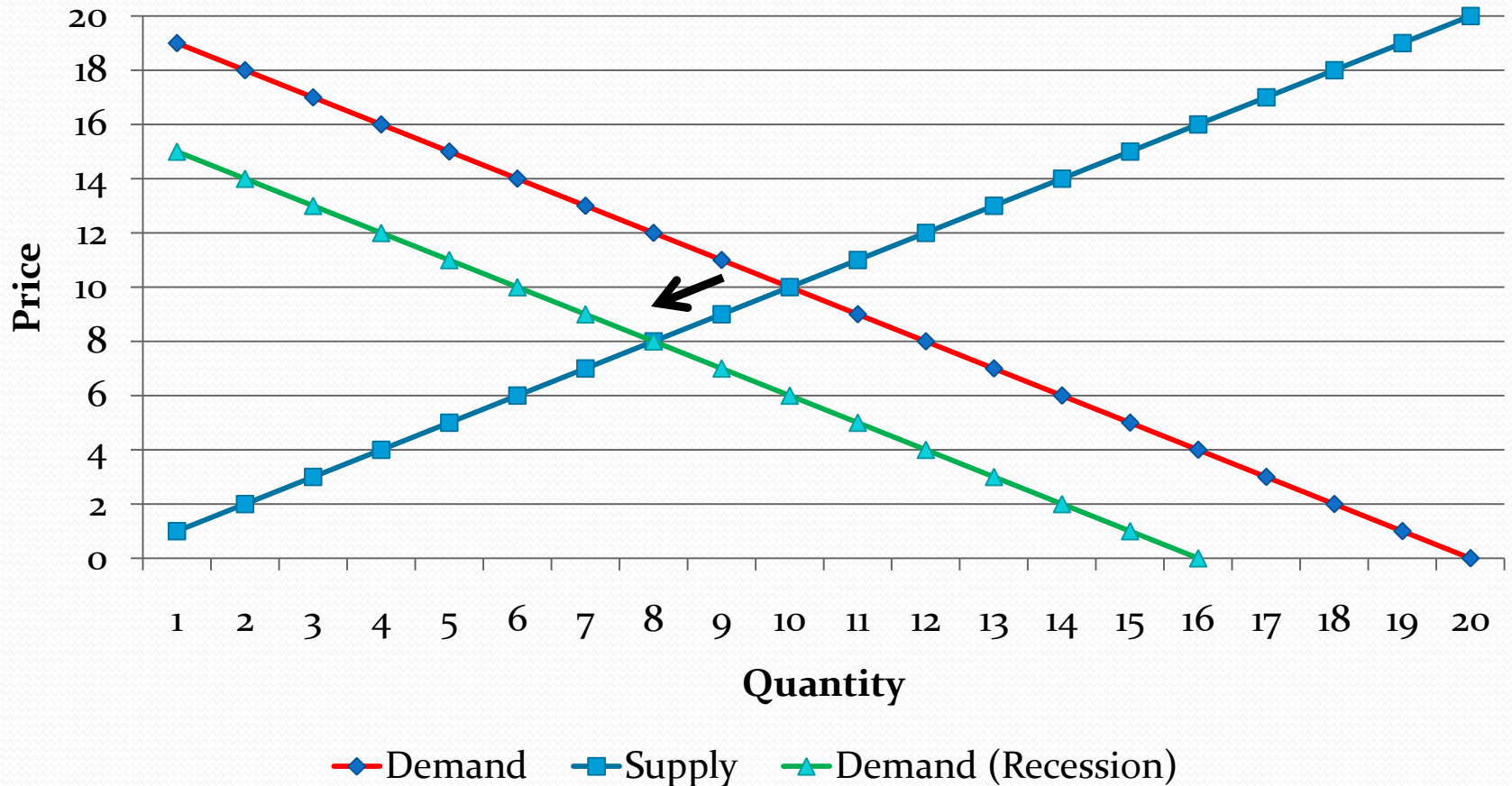
What We Covered Last Week IV

- Why is any of this important?
- Last week you wanted to know why our leaders got our Economy so wrong
 - It's not their fault any more than it's any of our fault
- It's time to show you why ... Through an experiment using you! But that comes later

Back to General Equilibrium

- You remember how Demand is supposed to equal Supply over the long run?
 - Therefore, the flower arranger and the customer come to an equilibrium price & quantity
- Economics views a sudden drop in Demand as equal to a Recession
 - Now there is too much Supply i.e. Factories are producing too many goods and shops can't sell things
 - So what happens?

A Sudden Drop in Demand



Recessions According to Economics

1. Demand Drops
 2. Therefore equilibrium price and quantity fall
 3. Therefore profit margins fall
 4. Therefore workers are laid off and factories are closed
 5. Therefore Demand drops even further
 6. And so on (it repeats)
- What about the opposite (a boom)?

A Sudden Rise in Demand

1. Equilibrium Price & Quantity rise
2. Profit margins increase
3. More workers are hired
4. Demand rises even further

One big problem can happen now:

- If Demand outstrips Supply by too much, people may start to outbid one another for prized goods causing their price to rapidly increase. When this happens for too many goods at once, it is called *inflation*

Inflation I

- This is what happened only a few months ago when food prices suddenly shot upwards:
 1. The price of oil rose significantly
 2. Almost all of our food is really converted oil (a minimum of 0.9 barrels of oil go into every “barrel” of food produced), so it rose in price too
 - 1 barrel = 6.1 GJ = 762 loaves of bread (8MJ each)
 - There are four loaves of bread in every litre of petrol
 - Therefore filling up your car might equal 160 loaves of bread
 3. Also there was an attempt by Western nations to convert food into biodiesel which sharply reduced supply

Inflation II

- Because of Inflation, you can't just give everyone €10,000 each and then they'd be rich
 - All that happens is that the prices jump massively until prices are a few thousand times higher
 - Then everyone is exactly as rich or poor as they were before
 - In other words, **nothing changes**
- Money Wealth is ALL about RELATIVE differences in value i.e. You versus other people

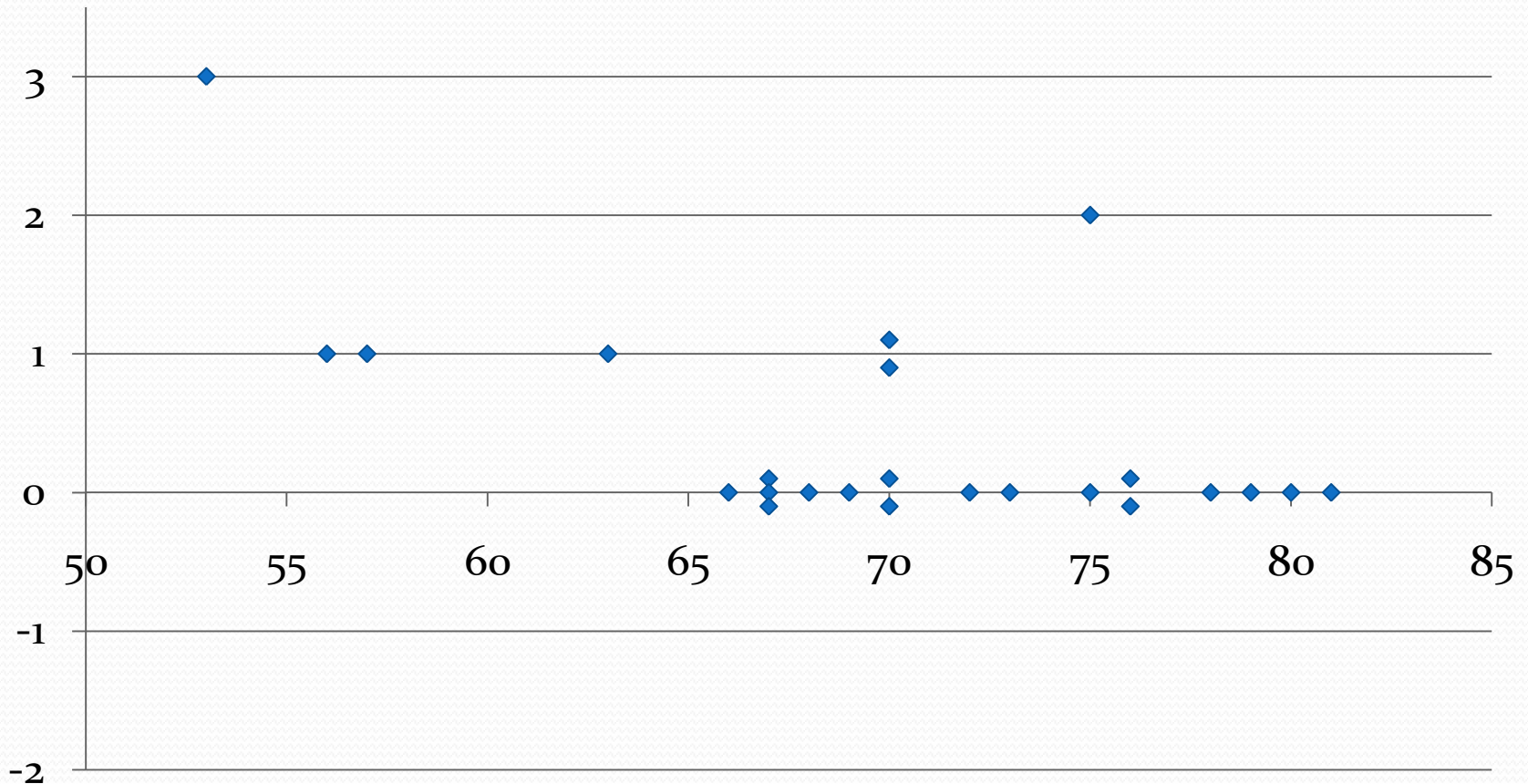
Inflation III

- Inflation is **really bad**
 - Inflation was what killed off the Roman Empire in the end, though it had been very sick for a long time
- The government tries to prevent inflation by raising the interest rate if it anticipates inflation, or lowering the interest rate if it thinks inflation will stay low
- This means that the government must try to predict the future
- Unfortunately, that doesn't always work – and here's why ...

Experiment:

Numbers aren't just Numbers

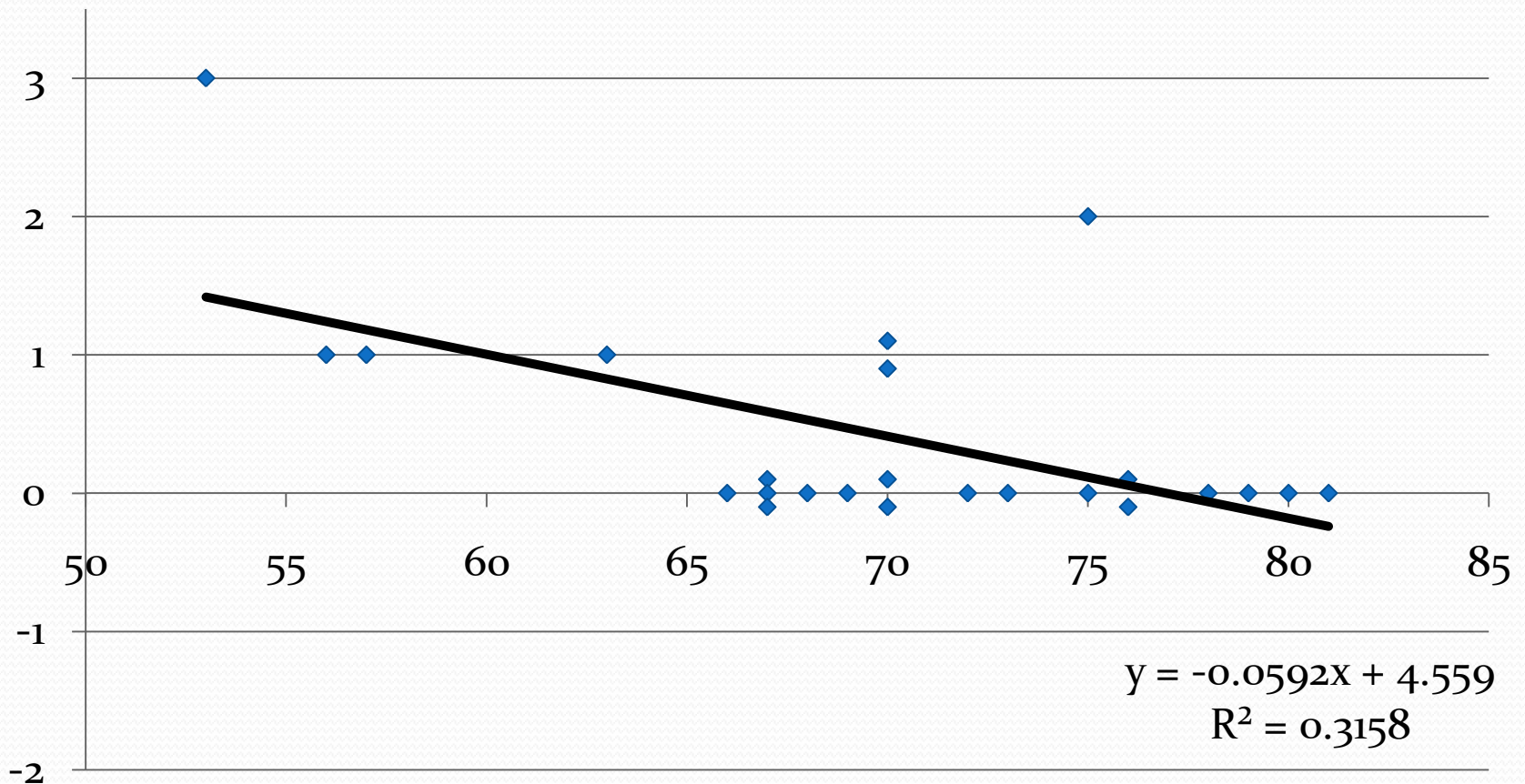
Draw a **straight** line as close as possible between these points



What you just did

- That Normal Distribution is how a statistician works out where to put the straight line in between a set of dots
- It is exactly the same as you drawing in it by hand (if you have very good eyesight)
- The technical term for drawing in this straight line is *a regression*

Here's one I did earlier



Experiment 1

- If that was roughly the line you drew, then congratulations:

You just blew up the Space Shuttle Challenger in 1986!

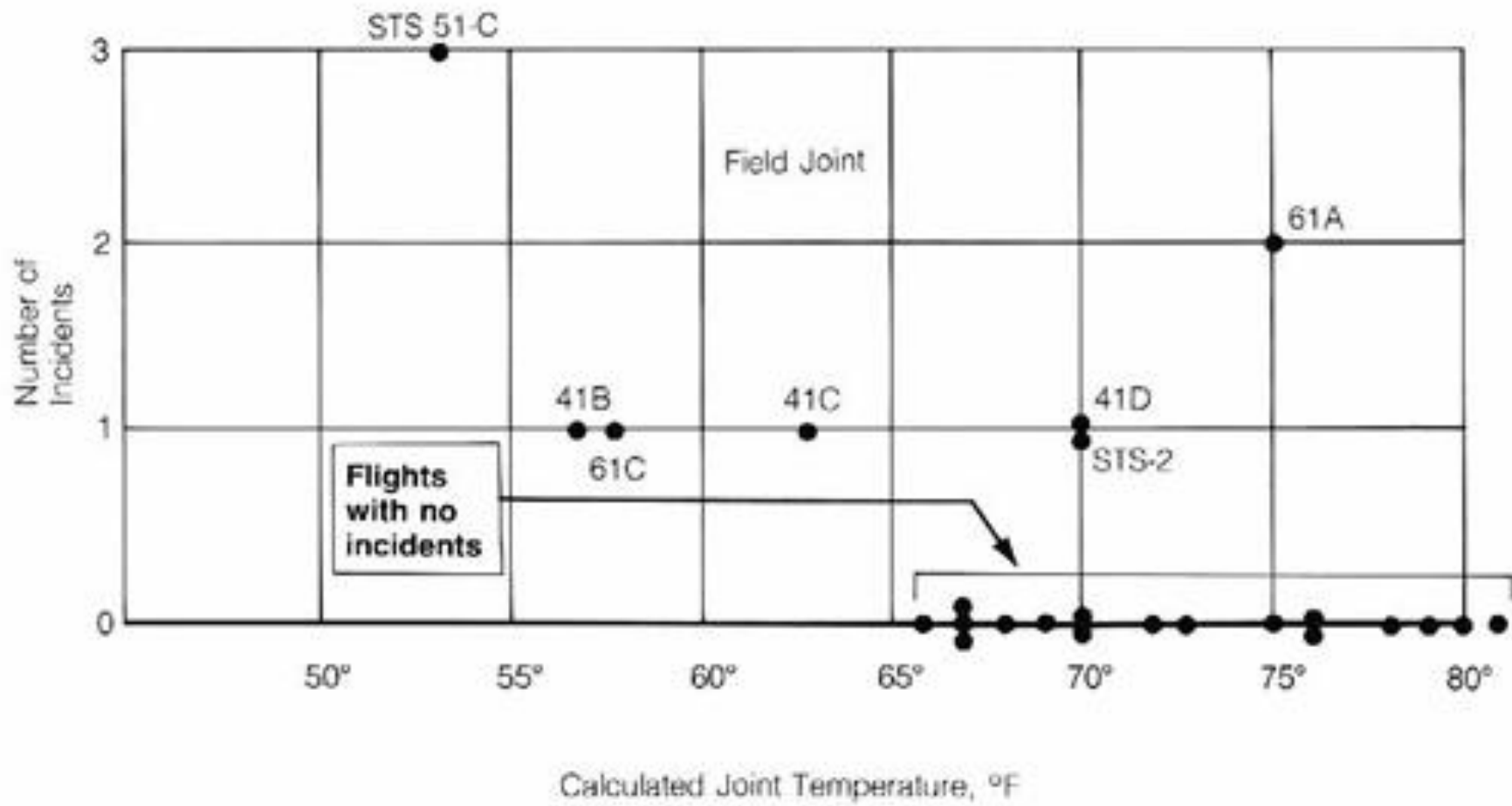
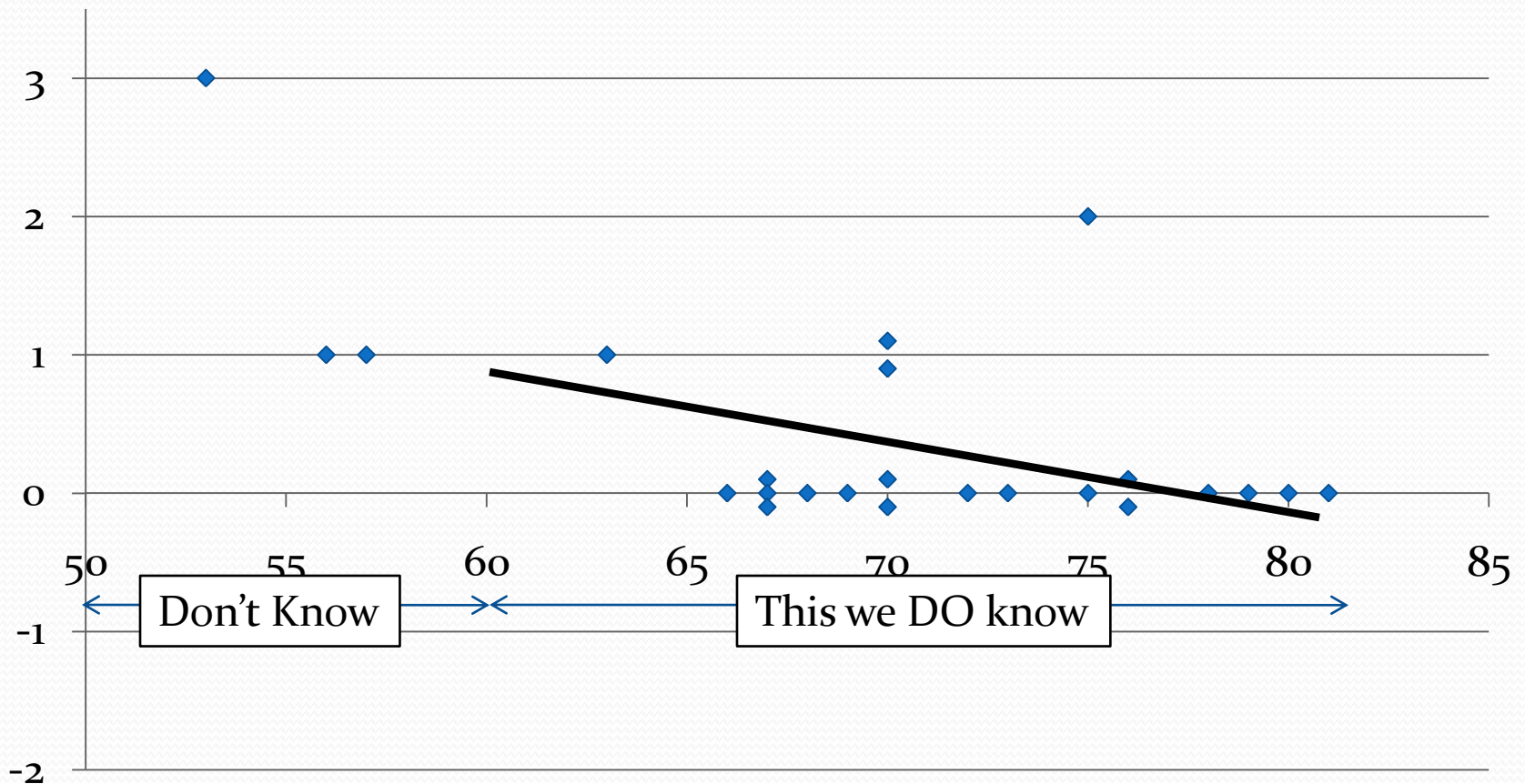


Figure 7
 Plot of flights with and without incidents of O-ring thermal distress

The Correct Line: It Stops Short



Space Shuttle Challenger

- NASA thought that the O-ring seals would behave similarly at lower temperatures as at normal temperatures
- Therefore they fitted a straight line to the history
- Unfortunately O-ring seals are made from rubber and they become very rapidly less springy as they cool
- This isn't a good idea when you're pumping a controlled explosion from the rocket engines through them

What does this mean? I

- Above 60F temperature, O-ring sealed systems *approach an equilibrium*
 - i.e. They try to reach some equilibrium point
- Below 60F temperature, O-ring sealed systems *diverge from equilibrium*
 - i.e. They try to **leave** any equilibrium as fast as possible
- It is the same thing as a pendulum hanging down versus a pendulum on its head

What does this mean? II

- An economy is the same. When within a certain range of conditions, demand and supply try to reach an equilibrium
- However, when those conditions change, demand and supply go off elsewhere on their own
- Neo-Classical Economics doesn't know how to handle this and just assumes that it must be temporary
- So which is better? When everything is ticking along nicely and tomorrow will be much like today
- Or when lots of change is occurring and tomorrow may be quite different to today?

What does this mean? III

- When you tried to draw the line, you assumed all the dots meant something similar, same as the NASA engineers
- It is **impossible** to know differently until it's too late
- Politicians, Economists and Banks all try to draw lines between the dots just like you [it's called LIFE]
- Most of the time it works, but sometimes it doesn't because the *meaning* of the dots has changed and the new dots have NOTHING to do with the previous dots
- The technical term for this is *a structural break*

How do structural breaks occur?

- A structural break is when “the game suddenly changes gear”
- You’ll see it in football games, economies, the weather, politics, even how ants choose their food source
 - (that’s in next week’s reading!)
- Equilibrium happens when *volatility is smoothed out*
- *Disequilibrium* happens when *volatility is amplified*
- And what chooses whether volatility is smoothed out or amplified? Easy: those slight changes in conditions

What to Take Away From This:

- We can predict the future ONLY when the situation behaves identically to the past
- Even a TINY initial difference can make a MASSIVE difference after time. But we don't know *which* tiny difference beforehand
 - The technical term for this fact of nature is *chaos theory*
- No situation ever repeats exactly, therefore if some tiny initial difference happens to create a massive difference after time, sometimes we get it right and sometimes we don't

**Therefore, can you blame
business & government
leaders if they fail to
predict a structural break?**

The Nature of Equilibrium I

- We know that Wealth is often seen as Stability
- Stability is usually seen as Equilibrium
- Equilibrium occurs when a system is tending towards internal balance

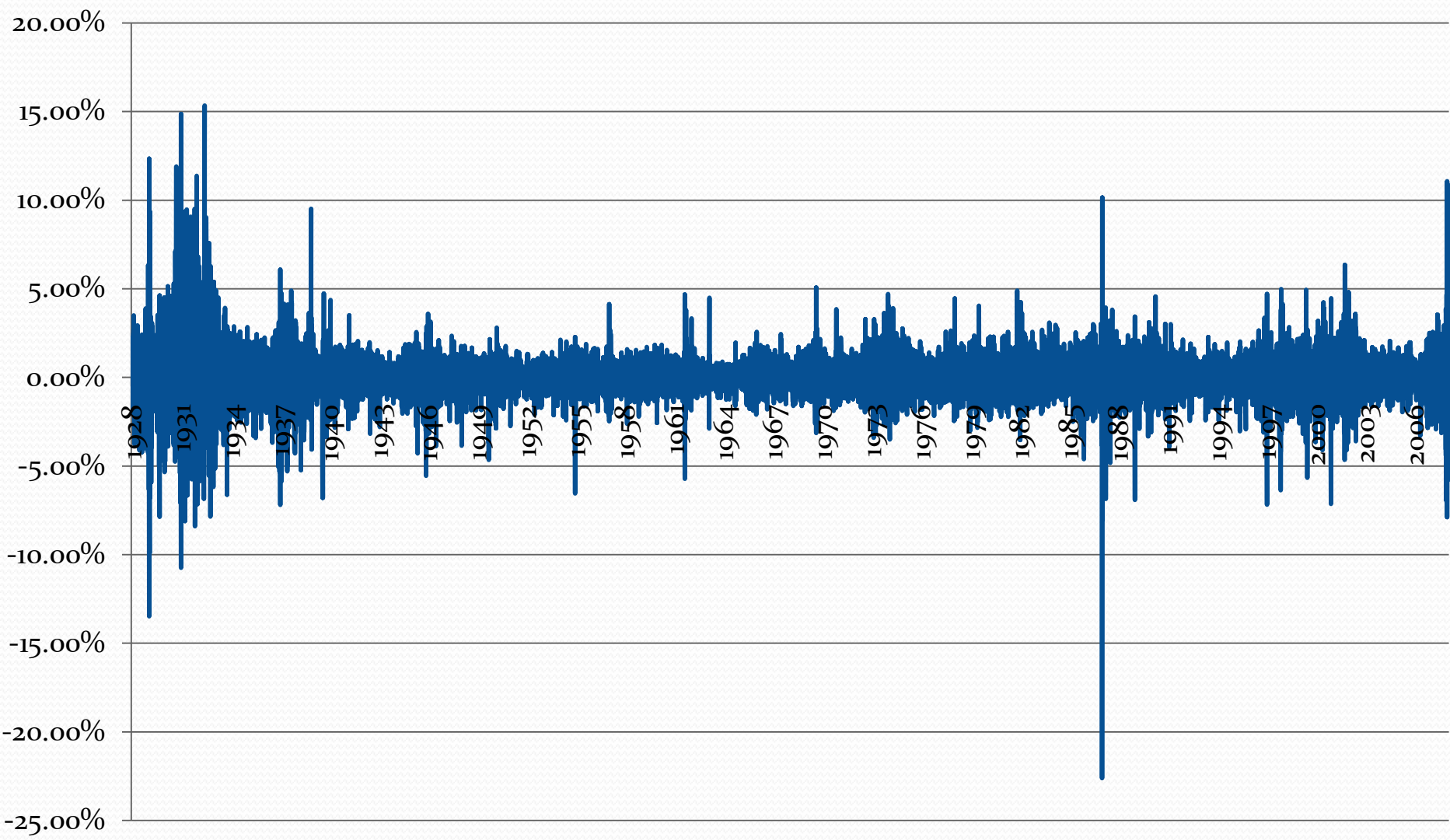
- So how often does Equilibrium happen or not happen?
- This equals how much volatility persists over time
 - (Standard Deviation is a measure of volatility)
- This depends on the system, but let's take the financial markets:

Testing the Truth of Equilibrium I

- If Demand and Supply always meet at an Equilibrium point, then surely the daily change in the stock market will be roughly zero?
- Let's take the Dow Jones Industrial Average 1928-2008:
Daily Average Change = $+0.0241\%$
Standard Deviation (how volatile it is) = 0.012

(This means it very slowly rises at about 9.2% per year and it's not very volatile at all i.e. It doesn't move around much from day to day on average)

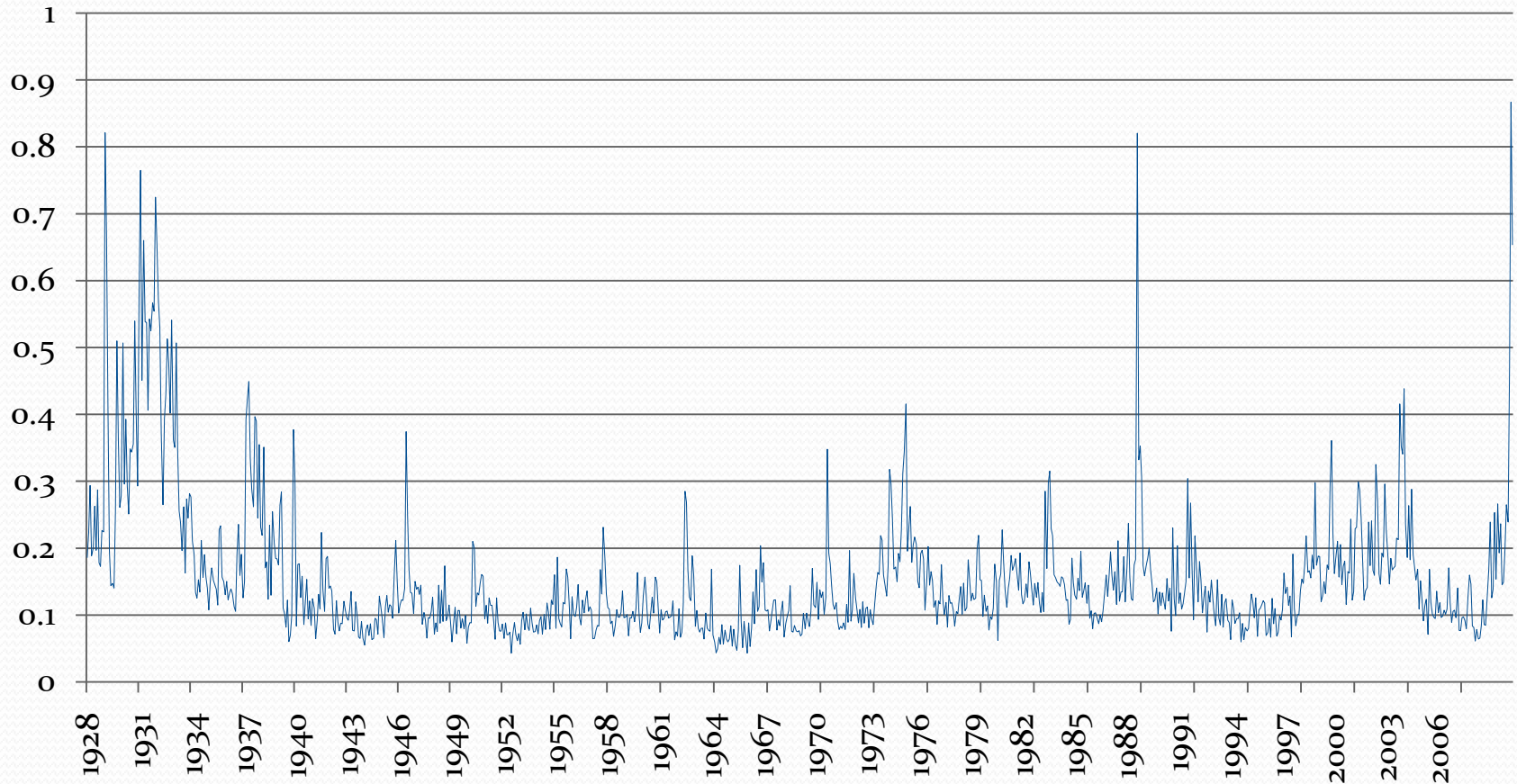
Daily Movement of Dow Jones 1928-2008



Testing the Truth of Equilibrium II

- The technical term for the assumption that price changes & volatility in financial markets are very low is *the efficient markets hypothesis*
 - It basically means that in the stockmarket, demand and supply are almost identical and don't move around much
- However, did you notice the large bumps every now and then? These are called *black swan events*

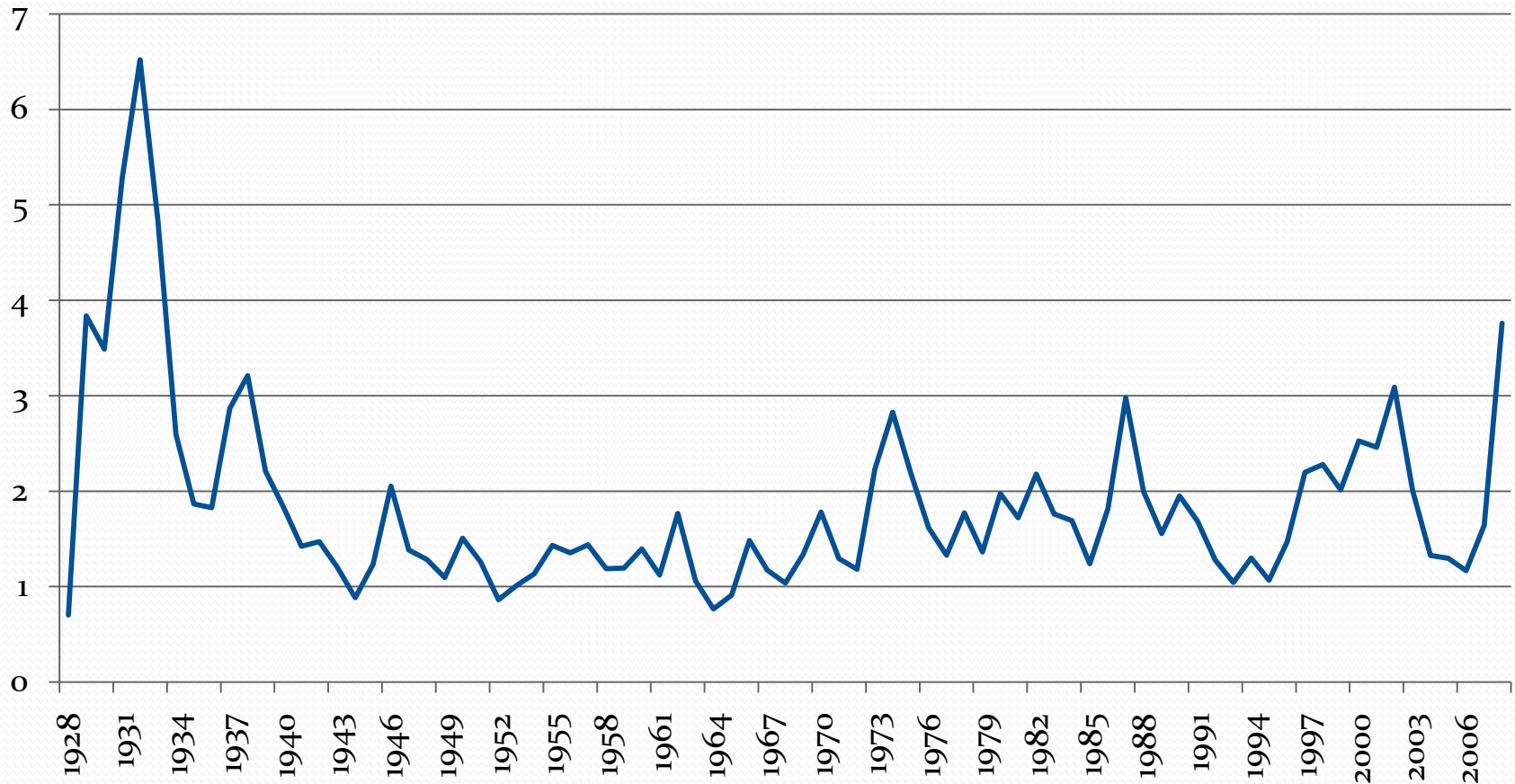
The Volatility of the Dow Jones



What does this mean?

- As you can see, equilibrium is more common when the Economy is going “well”, whereas there is more volatility when the Economy is going “badly”
- The same goes for individual firms & banks: if their share price is stable, they have investor confidence. If their share prices becomes **unstable** then they have lost investor confidence
- Did you notice that instability in the markets is rising over time?

Volatility of the Dow Jones II

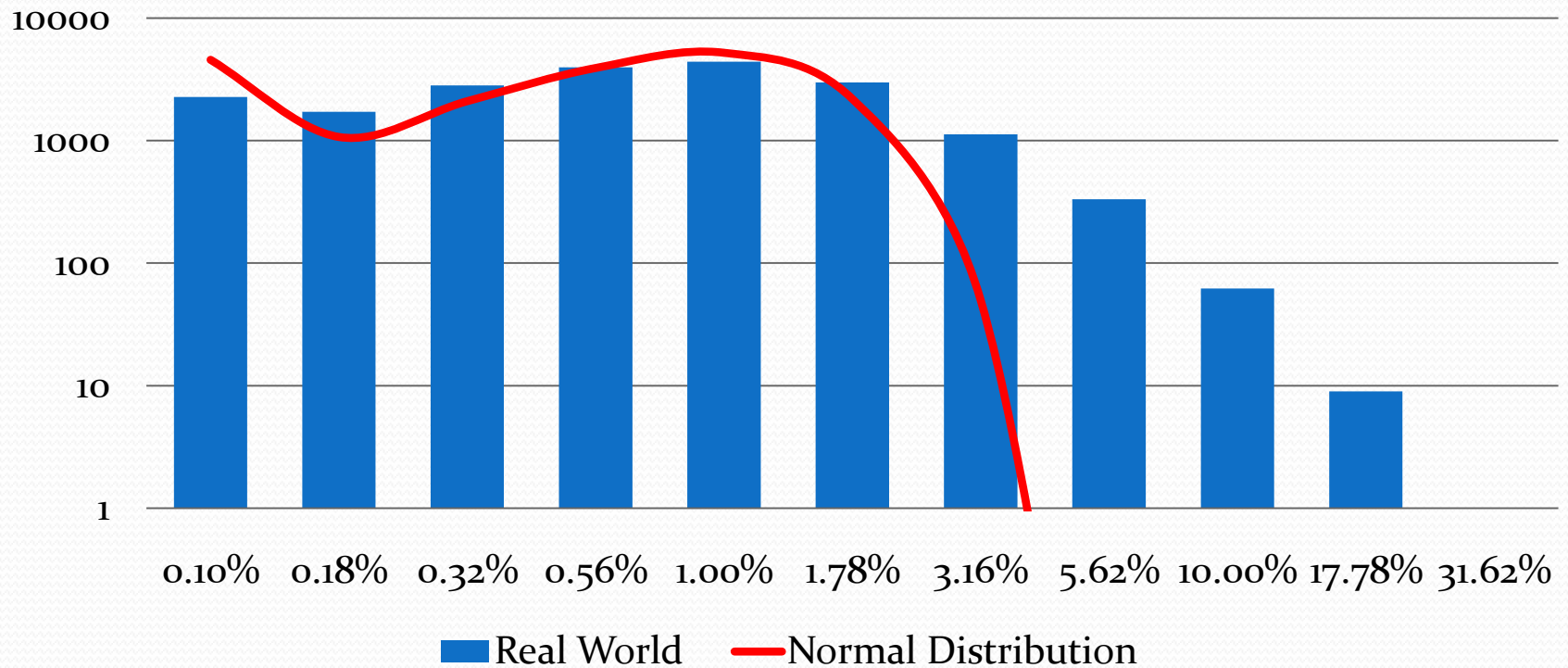


The Nature of Equilibrium II

- Did you notice when the rise began? Yup, late 1970s once again
- Increasing volatility over time = big change is coming
- But to answer our original question, how well does the Dow Jones fit a Normal Distribution?

The Nature of Equilibrium III

Log-Log Graph of Dow Jones Daily Movement 1st
October 1928 to 5th April 2007



The Nature of Equilibrium IV

- Out of 19,712 daily movements:

0%- 0.10%	0.10%- 0.18%	0.18%- 0.32%	0.32%- 0.56%	0.56%- 1.00%	1.00%- 1.78%	1.78%- 3.16%	3.16%- 5.62%	5.62%- 10.00%	10.00%- 17.78%	17.78%- 31.62%	31.62%- 56.23%
2267	1722	2830	3970	4417	2977	1124	333	62	9	1	0

10 days in eighty years = 0.0456% of the time it really badly breaks the Normal Distribution

In other words, it's rare! Rare enough to become complacent about it

Hence Politicians & Economists don't worry about it!

See You Next Week!