EC102 Macroeconomics

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Revision Document

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Abstract

This is a review of macroeconomic lectures by Franceso Caselli in Lent Term of 2019. The notes are mine fully and may not be authentic to the lecturer's as they have been modified.

The format of this material is usually recounted slide by slide but some slides may be merged together as the material fits appropriately with one another.

Contents

1   Introduction to Macro

Macroeconomics is about the performance of the economy overall. Topics that will be covered in this course are as follows:

- Long-run Economic Growth
- Booms and Recessions
- Inflation and Deflation
- Unemployment
- Financial, Currency and Sovereign Debt Crises

Further to that, here are some of the big macroeconomic issues that we are facing today in (**April 2019:**)

- Why are we growing so slowly and is the slowdown permanent?
- What are the consequences of **Brext** for UK growth?
- Has austerity been a good idea? In the UK? In the Eurozone?
- Why is inflation so low and what should Central Banks do about it?
- What will happen when Central Banks end **Quantitative Easing?**
- Will lower-income countries ever catch up to the high-income ones?
- Will there be a financial crisis in China?
- Have we done enough to prevent a new financial crisis?

> **Colin O'Shea:** *Market sentiment always dictates what will happen. Policy implementation may not always work as it is dependent on sentiment.*

Welcome to macroeconomics

2   Economic Growth

We will begin with a definition of Economic growth:
   It is the **long run** *changes in* **material living standards.**

   Long run means:

- Persistent changes over time
- One generation compared to the previous
- Definitely not a quarter by quarter analysis

   Material means:

- Food, housing: these are **physical objects**
- Education, healthcare
- Income to access these goods and services

2.1   Preliminary Questions on Growth

Further to this, we will ask some preliminary questions on growth to get the gears running:

- How do we measure it?
- Is indefinite growth feasible? i.e. **Growth forever on an upwards trend?**
- Is indefinite growth even desirable or **even a good idea?**

2.2   Measuring Growth

We will begin the discussion on growth by looking at various ways of measuring it

2.2.1   Measuring Growth: GDP per Capita

Definitions:
GDP: the value of all goods and services produced by an economy in a year
per Capita: divided by the total population

   This indicates that everyone gets an equal share of the pie *which might not necessarily be the case hence the doubt about the measure.*
But it does provide an idea of the **standard of living within the society**

The common consumption method of measuring GDP is:
$$GDP = AD = C + I + G + (X - M)$$

2.2.2 Measuring Growth: Median Income

Definitions:
Median income: the level of income at which 50% of the population is above and 50% of the population is below.

This gives a rough indication of the income distribution within a country, something that **GDP per Capita** does not show. This can be adjusted for family size as well.

In the UK, for example:

- Median: £27,300
- Average: £27,600

2.2.3 Measuring Growth: Multi-dimensional

Further to the previous two measures of growth which are strictly numerical, we can adopt multi-dimensional measures of growth as well. These are considered holistic approaches to measurement. Examples include:

- **The Stiglitz Commission:** a dashboard approach which measures a whole host of indicators such as health, education and politican voice
- **United Nations HDI:** a measure for GDP per Capita, education through literacy rates and mean years of schooling and life expectancy
- **Utility-based Index:** measures happiness through indicators such as consumption, life expectancy, inequality and leisure

2.2.4 Measuring Growth: Depletion

Another method to measuring growth is simply through depletion.
This means **we measure not what we build** but rather **what we have depleted in the process of building it.** This measure is an innovative way of seeing growth due to the economic problem of scarcity.

2.2.5 Focus on Growth

Concerning other factors such as education, life expectancy and so on, it is usually okay for us to **focus on growth** as there is a positive correlation with all the other measures:

- Over long periods of time
- Over countries with very different living standards

It simply provides a standardised measure which does not need to take in subjective accounts to be fully effective. The limitations it has can be supported by the holistic measures mentioned.

2.3 Sustainability and Desirability of Growth

Here we will discuss the sustainability of growth and whether or not an indefinite growth path is desirable in the first place.

2.3.1 Problem 1: Running out of resources

The issue is self-explanatory, when we begin to run out of natural resources, the growth trend will gradually plateau and then dip if we are unable to continue producing. Presented below are key solutions to the issue:

- **Substitution:** finding alternative solutions e.g. renewable energy rather than fossil fuels

- **Efficiency:** becoming better at using less or the equal amount for more e.g. mileage on a car has become much more efficient

- **Recycling:** reusing old unused materials again for production e.g. plastics, card etc.

Further to that, we have to recognise the role of the market and the role of public policy:

- Role of the market:

  - Spontaneity of market solutions that arise
  - Innovation from an incentive to profit
  - Creation of efficiency gains to capture a wider market share

- Role of public policy:

  - Promotion of sustainable growth
  - Use of regulation e.g. carbon caps or subsidies to promote to disincentivise or promote certain market practices.

2.3.2 Problem 2: Environmental Degradation

Environmental degradation and climate change are key issues that might affect our ability to grow. These are due to the issues cause by them that hinder economic growth such as weather patterns affecting our agriculture.
These are due mainly to externalities which:

- Arise when agents engage in activities which have an **impact on others** but has **no market** as the price adjustment mechanism is non-existent

- Have an effect on a third party during the **consumption or production** of a good or service

The technical solutions mentioned above are still key to resolving these issues but:

- Externalities are only easier to control at a local and national level

- Global externalities, which cause the most issues, is where the difficulty lies as **coordination across governments** is required but not guaranteed. *Trump and pulling the USA out of the Paris agreement is a good example.*

2.3.3 Is growth even a good thing?

Here is a proposal: **Zero Growth in rich countries.** This will allow us to:

- Have more leisure as there is no need to work

- Focus on what matters such as relationships, relaxation and pursuit of alternative activities such as your hobbies

But here are some pro-growth arguments to counter those above:

- Quantity of life is greater due to a **longer life expectancy**
- Periods of low growth lead to nasty politics: avoid this by not advocating for a **Zero Growth** policy

So perhaps we can leave the no-growth option as an individual one. You choose yourself if you want to pursue this path but it should not be one that society as a whole adopts.

2.4   Economic Growth: Appendix

Find related materials here

2.4.1   Formulae and Definitions

- **Growth Rate:**
    - Change is the new level divided by the initial level
    - **Formula:** $\frac{GDP_{T2}-GDP_{T1}}{GDP_{T1}}$

2.4.2   Figures

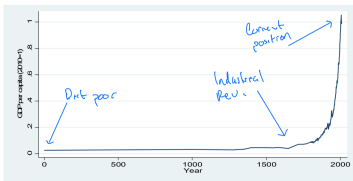Figure 1: Britain's GDP over time
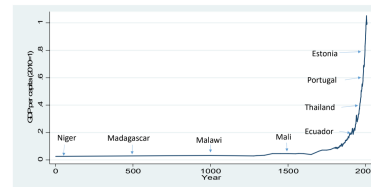
Figure 2: Britain's GDP compared to other countries NOW
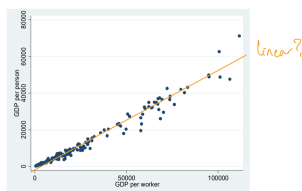
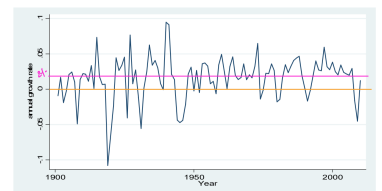Figure 3: GDP vs Productivity

Figure 4: Britain's GDP Growth Trend

3 Growth Engines

Here we move onto the main drivers for growth in the economy. We will use an analogy of a hunting village, whereby the hunters use arrows to catch their game, to spell out these engines specifically. The engines that we will discuss are as follows:

- More arrows per hunter: **Capital Accumulation**
- Better arrows to use: **Technological Change**
- Hunting in a pack: **Management Quality**
- More hunting training: **Human Capital Accumulation**

 n.b. For this example, we will assume that $Kills/worker = GDP/capita$ **and** $Kills\ Total = GDP\ Total$

3.1 Capital Accumulation

More arrows per hunter in our analogy is called **capital** accumulation as we have more productive resources to utilise in our day to day production of game. This is done through the process of **investment.**

3.1.1 Definitions

Beginning with some definitions:

- **Capital:** the stock of equipment and structures at a certain point in time
- **Investment:** the addition toe the stock of equipment and structures

3.1.2 Accumulation and Growth

The causal mechanism for accumulation and then growth is through how workers use capital.

 Think of capital as **aids in production to effectively produce more,** like how the arrows in the hunting village help with killing more animals.

 Investment leads to the accumulation of this capital as there will be growth in **capital per worker,** adding to the overall stock.

 Growth in capital per worker leads to growth in **GDP per worker** as each worker is more productive.

3.1.3 Nature of Investment

The nature of investment is such that there is a sacrifice of current consumption to achieve a greater level of future consumption. Some of the workers and capital are labouring to produce new capital instead of producing goods and services for immediate use.

3.1.4 Investment in an Open Economy

We can not sacrifice consumption domestically to gain investment into the economy through the use of imports: **capital goods are imported whilst domestic workers dedicate themselves to consumption goods.**

However, this implies **debt accumulation** as you are borrowing funds to pay for these expensive imported capital goods. Since foreign debt cannot be accumulated **indefinitely,** the consumption sacrifice is only postponed to a later date. This is when there is a requirement to pay off debt. Hence, **the later sacrifice** meaning that there is still a trade-off between investment and consumption.

3.2 Technological Change

Better arrows per hunter is called **technological change** as we have better productive resources to utilise. **Note that this does not mean more productive resources.** As we have better resources to use, we are more productive with them. Change happens through **innovation.**

3.2.1 Definitions

Beginning with some definitions:

- **Innovation:** introduction of new ways of doing more with less or the same amount. These efficiency gains are found in the **production process.** Innovation is usually knowledge shared freely in society.

 Note that in modern economies, innovation is the outcome of:

- Basic research, mostly done in universities
- Research and Design **(R&D),** mostly done in firms

3.2.2 Economics of R&D

There are some key characteristics of innovation that must be recognised to show the thorny parts of R&D as it can sometimes cause barriers to technological change:

- **Upfront research costs:** Increase the burden of risk as there is a large requirement of upfront capital.
- **Non-Rivalrous:** One person's use does not exclude another person from using it. This means that if one firm creates an idea, without any protection around it, another firm can steal the idea and use it.

Hence, without any intervention, the costs for R&D are too high whilst the benefits are too low. We can see that with an equation below:

$$N = Net\ Benefit$$
$$R = Reward\ for\ Successful\ R\&D$$
$$P_R = Probability\ of\ Success$$
$$C = Cost\ of\ R\&D$$
$$P_C = Probability\ of\ Idea\ Stolen$$

Hence knowing that P_R is low and P_C is high, we have the equation:

$$N = R \times P_R - C \times P_C \text{ where } N < 0$$

3.2.3 Policy Solutions to the R&D Problem

Here are some solutions:

- Patents:

  - Intellectual property rights
  - Effective creation of monopolies over a certain good or service
  - Usually lasts 15-20 years
  - Opportunity for firms to make profit from their R&D

- Subsidies: reduced costs for R&D ventures conditional on their R&D performance

3.2.4 Economics of Basic Research

Basic research is about the type of activity generating positive externalities, **that is, a positive effect on a third party during the production or consumption of a good or service, in this case *research*.**
In terms of the funding:

- Subsidies are given by the government e.g. Economic and Social Research Council (ESRC)

- Stimulates research and research proposals

- Adds value to the economy without the pricing mechanism in place effectively 'shifting the frontiers of what is possible.'

3.2.5 Technological Change in Poorer Countries

Imitation makes a lot more sense than innovation in poorer countries. However, the issue is that **knowledge does not flow that easily.** Limited knowledge leads to a lack of accessibility. Successful imitation, however, shows miraculous levels of growth: **China and Japan being notable examples**
This issue of information dissemination is because new ideas contain two types of knowledge:

- **Explicit Knowledge:** formulas, blue prints, instructions

- **Tacit Knowledge:** nuanced knowledge like application with certain people etc. which cannot be communicated as effectively.

3.2.6 Sources of International Technology Diffusion

There exists two main ways of technological change moving around the world:

1. Foreign Direct Investment
2. Trade

Foreign Direct Investment (FDI):

- Foreign entity starts or acquires productive resources outside their home country

- Direct technology transfer through a literal implementation of the firms technology abroad

- Diffusion through imitation clusters, when the technology from an initial investment is taken up by aspiring entrepreneurs

- Competition with local, inefficient firms who need to learn/imitate/adapt or be pushed out of the market due to being priced out

Trade:

In trade there are exports and imports. Both contribute to technology diffusion:

- Imports:
    - Embodied technology e.g. importing IT systems
    - Pressure on local inefficient firms to adapt $\rightarrow$ same as FDI

- Exports:
    - Learning by exporting $\rightarrow$ learn to be more efficient and learn how to adapt to the demands of countries abroad
    - Market size increases $\rightarrow$ access to a larger market allows for diffusion of technology into developing countries simply because of broader exposure

3.2.7 International Tech Diffusion and IPRs

Question: Should poorer countries enforce intellectual property rights (IPRs) of rich-country firms?

There is a temptation to believe that not enforcing them can lead to cheap production by imitation however possible problems persist:

- It discourages FDI as there is no more profitability for these foreign firms to come into the developing market

- There would be adverse effects on rich country innovation as there is no longer an incentive to innovate. *This is based on the premise that firms are innovating to conduct FDI*

- Rich countries simply do not like it. This might result in a lack of trade and a souring of international relations which can subsequently cause a trade war

Yet, even with enforcement, a lack of enforcement could persist anyway due to the negligence of IPRs and Patents in developing countries. Hence, the issue appears to be much more complicated than black or white.

3.2.8 Embodied Technology

The distinction between capital accumulation or growth and innovation or imitation is conceptually useful. **However,** in practice, a lot of innovation or imitation is embodied in capital itself. Thus, the two often come in the same package. Investment is itself a source of technological change.

3.3 Management Quality

Management quality drives growth through putting people who are good at the right thing in the right place. This is done through **specialisation** and **comparative advantage.** Examples of high management quality:

- Adam Smith's pin factory → division of labour (specialisation)
- Henry Ford's assembly line → division of labour as well
- Outsourcing and global supply chains → utilising comparative advantage
- Gig economy → workers connecting through an information supply chain with an increased division in labour and level of specialisation

3.3.1 Definitions

Beginning with some definitions:

- **Specialisation:** focusing on one task and increasing the efficiency at which it is done.
- **Comparative Advantage:** whereby the opportunity cost to produce something for something else/someone is less than another entity. *One would say that a country has a comparative advantage if its opportunity cost to produce is less than another's.*

Further to that, organisational change can sometimes come as a form of technical change. You can do more with the same resources and it often requires some upfront R&D investment. An example would be something like **software to manage supply chains,** both organisational and technical.

3.3.2 The Indian Manufacturing Case Study

To test the real effects of management quality, consulting companies went into India to perform a test whereby control groups of firms were given no management consultants while tested firms were given management consultants to fix their most pressing issues over a few days.

Before:

- The manufacturing firms in India were very disorganised with dirty and poorly maintained machinery whilst equipment was lying across the floor.
- Yarn had no labels, order or damp protection. Further, it was piled so high, access was restricted in the factory itself
- Poor storage practices also made some stock unusable, requiring further treatment to be used again

After:

- Stock was organised and labelled
- Stock was also tagged and entered into the computer
- Factory was cleaned and maintained to a higher standard

3.3.3 Managerial Quality

Within a country, there is a big disparity in productivity among firms possibly due to the differences in managerial quality as a result of the different levels of organisation. There would be big gains from bringing up efficiency at the tail: *the lower end of the*

distribution is lagging far behind but can account for a lot of firms within the country.

Causes of Poor Managerial Quality:

- Dynastic Management: management of the firm kept within a family, not meritocratic and there is no guarantee of skill or will from future generations
- Crony Capitalism: Prevalent in low-income countries. Owners and managers are kept in a tight circle and benefits are accrued through political connections.
    - Shareholders can benefit due to their own connections
    - Productivity will be low due to mostly incapable management $\rightarrow$ again, not meritocratic but based on nepotism
- State Owned Enterprises: directly appointed by the government, low productivity due to failed selection process at some points

Entry Costs, Financial markets and Managerial Quality

- Talented outsiders could:
    - Buy out incumbents $\rightarrow$ but a lack of capital means they might not be able to, further, they can't judge their own talent compared to the market without experience
    - Enter with their own startups to compete them out of the market
- High entry costs:
    - Upfront production costs as capital raising is difficult
    - Licenses, permits etc. are barriers to entry
- Poorly developed financial markets:
    - Typically as a result of inefficient contract enforcement
    - This adds further difficulty to ensuring capital

Hence, it is obvious that Managerial Quality can be severely affected by a plethora of other factors. However, its contribution to growth can also be very large, especially at the weaker end of the distribution where basic practices - **ref: Indian Case Study** - have not even been implemented.

3.4 Human Capital Accumulation

More years in hunting school in our analogy translates to human capital accumulation. With more human capital, workers are intrinsically more productive and efficient and can apply their knowledge to technological, capital and managerial change. This is a cumulative effect from education that has knock-on effects on the facilitation of innovation and imitation.

3.4.1 Definitions

Beginning with some definitions:

- **Human Capital:** anything embodied in workers which makes them more productive, a form of internal development

The greatest focus of policy thus far has been **schooling** and **health** which aim to improve a persons ability to live and participate in the economy. Examples of foundations that have helped to develop this are:

- The Gates Foundation who aid in Malaria efforts and education
- The United Nations who have committees dedicated to raising the standard of living through education and healthcare especially in underdeveloped countries

3.5 Engine Interaction

We will discuss here how these growth engines interact and whether or not growth can come from a single engine. The latter first:

> **Ten hunters, 3 permanently on arrow-making duty. Initial endowment of 1 arrow power hunter. Over time, the change in GDP per worker will:**
>
> 1. Increase
>
> 2. Decrease
>
> 3. Stay constant
>
> *Answer is 2.* **Decrease due to the diminishing marginal returns on capital.** At some point, producing more capital leads to a plateauing increase in productivity.

Capital accumulation and GDP growth is shown through the average product of capital. This is known by $Average\ Product\ of\ Capital = \frac{GDP\ per\ Worker}{Capital\ per\ Worker}$

In our hunting village example this would translate to $APC = \frac{Deer}{Arrows}$. Gains from additional capital is known as the marginal product of capital which is known by the additional gain to product when there is a **unit increase in capital.**

3.5.1 Limits to Growth from Capital Accumulation

There are definitive limits to simply using investment as a driver for growth:

- The average product of capital declines due to the law of diminishing marginal returns
- The investment rate has a natural ceiling as it is limited by what is available i.e. it is difficult to invest beyond 100% of GDP
- Capital accumulation alone cannot sustain indefinite growth

From this we can see that:

- Capital accumulation depresses the average product of capital
- Innovation, organisational change and human capital accumulation boost the average product of capital
  - Hunting in a pack improves the productivity of all arrows
  - More trained hunters improve the productivity of all arrows

Hence all engines appear to complement one another to ensure that one engine does not depress the average product of capital entirely.

3.5.2 Engine Complementarity

Technical, organisation change and human capital accumulation keep the average product of capital falling even though capital per worker keeps increasing.

Although they might depress their own marginal productivity, this is offset by growth in the other engines. Think of the engines as multiplicative instead of additive:

$$Engine\ 1 + Engine\ 2 + Engine\ 3 + Engine\ 4$$

3.5.3 The Role of the State in Growth

The State plays a major role in the growth of the economy and they can facilitate it or hinder it depending on their policy. Below are ways in which the State can impact growth:

Fuel for Engines

- Investment in infrastructure which is a capital good
- Subsidies for R&D and basic research
- Investment into education and healthcare with good policy

Regulation

- Markets for goods and services are regulated by the state dictating what conditions people can operate under
- Regulation for labour and financial issues are regulated along the same lines
- International trade which is facilitated by the state through free trade or hindered by tariffs and trade wars

Rule of Law

- Laws to change the operation of companies e.g. GDPR in Europe
- **But** rigidity is also key for smooth business operation as predictability is key to confidence in operations
- Implementation of processes we can follow within a reasonable boundary

3.5.4 Corruption and Growth

Another issue to consider when thinking about growth is corruption. Here are some reasons why:

- Saps incentives for innovation, imitation and investment if corrupt officials target successful entrepreneurs. This is due to the burden of bribe payments which means less money to innovate or incentivise productivity.
- Creates barriers to entry for outsiders if those inside use corruption to buy protection, privileged treatment or judicial bias which means less incentive to innovate or even try in the first place
- Deprives government of funds for infrastructure, education, administration of justice due to embezzlement. This means less investment into the engines of growth within the economy by the government

3.6 Growth Engines: Appendix

Find related materials here

3.6.1 Formulae and Definitions

- **Investment Rate:**
  - A measure of the sacrifice an economy makes of current consumption for a greater level of future consumption
  - **Formula:** $Investment\ rate = \frac{Level\ of\ investment}{GDP}$
- **Average Product of Capital:**
  - The amount of product that you gain from total capital invested into a worker
  - **Formula:** $Average\ Product\ of\ Capital = \frac{GDP\ per\ Worker}{Capital\ per\ Worker}$
- **Δ in Capital per Worker:**
  - The change in capital that a worker has, averaged across the whole economy
  - **Formula:** $\Delta Capital\ per\ worker = investment\ rate \times GDP\ per\ Worker$
- **Growth Rate of Capital per Worker:**
  - The growth in capital that a worker has, averaged across the whole economy
  - **Formula:** $Growth\ Rate\ of\ Capital\ per\ worker = investment\ rate \times (GDP\ per\ Worker/Capital\ per\ worker)$

4 Economic Fluctuations

This section will dive into the economic fluctuations commonly seen within an economy. There exists two types of fluctuation in the economy:

- Aggregate Demand Shocks
- Aggregate Supply Shocks

These can also be talked about as:

- Tailwinds $\rightarrow$ pick up in growth
- Headwings $\rightarrow$ shock slowing down rate of growth

4.1 Demand Shocks

We will first discuss demand shocks in the economy.

4.1.1 GDP Composition

Recalling the equation

$$GDP = C + I + G + (X - M)$$

From here we can see the breakdown:

- **(C)onsumption:** goods and services bought by households

- **(G)overnment Spending:** goods and services bought (or produced) by the government

- **(I)nvestment:** investment goods bought by firms

- **(E(x)ports):** goods, services and investment goods sold abroad

- **(I(m)ports):** goods, services and investment goods bought abroad

With these we can move on to how this composition can cause the actual shock.

4.1.2 Aggregate Demand

Anything that suddenly causes:

- A change in government spending **G**

- A change in *desired* investment **I**

- A change in *desired* investment **C**

- A change in net exports **NX**

Following that, we can see some examples of demand shocks:

- **G:**

  - Wars $\rightarrow$ planned spending increases due to necessity of building and providing materials
  - Changes in ideology $\rightarrow$ austerity in government spending, reducing **G** by a large amount
  - Fiscal crises, such as Venezuela and hyperinflation and further Sovereign Debt Crises

- **I and C:**

  - Changes in taxes $\rightarrow$ increases in income tax decreases ability to consume while increases in corporate tax will reduce investment - the counter case is probable too
  - Changes in wealth $\rightarrow$ anticipation in increasing wealth and its tangible effects on how one would spend. If you think you are wealthy, your propensity to spend increases as well
  - Psychological changes (Keynesian animal spirits) $\rightarrow$ anticipation, proclivities or behavioural reaction that is unpredictable and ultimately reliant on the individual

- **X - M:**

  - Changes in exchange rates $\rightarrow$ a result of currency strength
  - Foreign demand shocks $\rightarrow$ they could reduce or increase exports and imports depending on what the shock is. If it's negative, exports are likely to reduce while imports, due to lower production, might also reduce

However, one has to be careful on the causality of aggregate demand shocks on GDP:

$$GDP = C + I + G + (X - M)$$
This is not a causal relationship

You have to question what makes firms respond to the change in AD as GDP is not simply caused by planned spending. There is a missing step as well that might not be identified in the equation.

4.1.3 Narrative of the Aggregate Demand Shock

With the previous in mind, let's construct a narrative to show how an aggregate demand shock actually works:

1. Consumers decide to spend 10
   - They have increased confidence
   - They have an improved ability to pay
   - They have an increased level of wealth

2. This leads to an increase in aggregate demand by 10% as planned spending has increased

3. Marginal costs go up
   - Marginal costs of production increase
   - This is through expansion of production due to demand increasing

4. Prices go up
   - Since marginal costs increase, this is translated into price:
   - $MC > P \therefore P \uparrow \therefore MC \uparrow \ until \ MC = P$

5. Increase is proportional i.e. 10% increase in prices
   - Price increase will match demand increase
   - Equilibrium is a situation where the economy ends up in after the shock

The price increase matches the demand increase because:
- Consumers are happy as they are spending 10%
- Firms are happy as marginal cost is up 10% as it depends on prices and wages
  - Same amount of materials and workers
  - Wages are 10% higher as well due to price increase, all
- Marginal revenue is up 10% as it is the price, MR=MC

Lessons from the narrative:

After an aggregate demand shock:
- Quantities change in the same direction
- Prices (gradually) adjust in the same direction
- After prices have adjusted, no effect on quantities, a movement back to its original position

The size and duration of effect on quantities depend on speed of price adjustment:
- A fast price adjustment has a small impact on quantities

- A slow price adjustment has a big impact on quantities

We can see that price changes, however, vary heavily between firms. Below is a table of collected data from the University of Chicago by Blinder (1994):

Frequency	Percentage of Firms
Less than one	10.2
Once	39.3
1.01 to 2	15.6
2.01 to 4	12.9
4.01 to 12	7.5
12.01 to 52	4.3
52.01 to 365	8.6
More than 365	1.6

Hence, we can see that the price change which is most popular, **once,** shows the relatively infrequent changes in price that a firm puts out. It can be argued that due to this low infrequency, the aggregate demand shock is actually absorbed by firms.

Explanations for Price Stickiness

Here are some explanations why prices might not change as frequently as one might think, i.e. in alignment with the **frequency of aggregate demand shocks** people experience.

- **Menu costs:** there are costs associated to changing the price such as physically having to print new menus
- **Information costs:** there is an opportunity cost of time to get and process information on what the right price to put is
- **Strategic considerations:** perhaps being the first to move on price might be bad, especially increasing, as market share can go down drastically if a lot of other substitutes are in place
- **Wage rigidity:** wages change very rarely, typically yearly, so price adjustment would not fit wages. Wages $\rightarrow$ Demand $\rightarrow$ Prices. Thus rigidity begets rigidity, if prices were to change, consumers might switch or not purchase

4.2   Counter-cyclical Policy

Goals of counter-cyclical policy:

- Counter negative aggregate demand shocks to prevent recessions
- Counter positive aggregate demand shocks to prevent excessive inflation

There are two main types of counter-cyclical policy:

- **Fiscal Policy:**
  - Changes in government spending (including transfers) and taxes
  - Run by the treasury (though this is country dependent)
- **Monetary Policy:**
  - Purchases and sales of financial assets, setting of statutory i.e. required interest rates
  - Run by the central bank

4.2.1 Fiscal Policy

Here are some concepts related to **fiscal policy:**

- **Government Spending:** goods, service bought or produced by the government along with transfers such as benefits and interest paid
- **Government Revenues:** from mostly taxes
- **Deficit:** $Spending > Revenues = \Delta Debt$
- **Surplus:** $Spending < Revenues = -\Delta Debt$

Fiscal policy also has a dual role:

- A source of demand shocks: the recent austerity programme in UK
- A tool to counter other demand shocks: increase in deficit in recessions to increase spending, fiscal stimulus policies in 2007-2009

Further to that, there is the concept of the fiscal multiplier: the change in GDP due to a £1 change in the deficit. This multiplier is generally thought to be **greater than 0 and less than 1.** Below is a sample question:

> **Suppose the government spending multiplier is less than 1.** $C+I+NX$ ____ **when G increases:**
>
> 1. Increases
> 2. Decreases
>
> *Answer is 2.* **Decrease due to GDP remaining constant as** $Y = C + I + G + (X - M)$**.** This means that $C + I + (X - M)$ will reduce to balance G increasing.

Crowing Out: However, given the use of fiscal policy, crowding out is also a major issue:

- **Definition:** The crowding out effect is an economic theory arguing that rising public sector spending drives down or even eliminates private sector spending. (Kenton 2019)
- Some of the increase in spending mobilises idle resources but some diverts resources from other uses. *The multiplier is larger when there are many idle resources*
- Some of the tax cuts are spent on goods and services but some are saved. *The multiplier is larger when people have a large propensity to consume*
- Fiscal policy is most effective in severe recessions **i.e. the multiplier > 1**

Hence, crowding out means a reduction in private spending despite the government's initiative to increase spending overall. This is shown by saving from reduced taxation or shifting resources instead of mobilising them. There is minimal crowding out when there are many idle resources but a significant crowding out when significant tax cuts could lead to savings.

There are limits to **Expansionary Fiscal Policy:**

$$Deficit = \Delta Debt$$

Deficit adds to the debt:

- If the deficit is $+ve$, $\Delta Debt$ is $-ve$
- If the deficit is $-ve$, $\Delta Debt$ is $+ve$

However, note that the deficit is still beneficial in some cases. As we discussed before, the increase in borrowing can be used to fund capital goods that might increase future consumption greatly. Just using debt in moderation is required.

Thus, here are some **Golden Rules for Fiscal Policy:**

- Run a deficit in recession and a surplus during the boom. **Fiscal Policy should be countercyclical where possible**
- **Balance the budget on average,** this comes from following the previous advice
- **Do not run a balanced budget all the time!** Governments need to know how to be contextual with their balance sheet to promote growth or slow it in anticipation of a recession

4.2.2 Monetary Policy

We now move onto Monetary Policy. This is seen to be the job of central banks: the Federal Reserve: **The Fed,** the Bank of England: **BoE,** the European Central Bank: **ECB,** the Bank of Japan: **BoJ** and so on.

Their goals are to **counter demand shocks** and this is done through:

- Monetary policy to affect **interest rates:** the cost of borrowing and reward for saving
- Interests rates then affect Consumption and Investment