

# An Introduction to Competing Macroeconomic School of Thoughts

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## 1 Introduction

Knowing the bigger picture – I believe – is particularly important when it comes to macroeconomics.<sup>1</sup> A variety of different macroeconomic schools of thought and approaches exist to explain economic growth and development and incredibly much thought and effort has been put into those different research agendas to shed light on those questions. As a result, independently from any macroeconomist's personal standpoint on these issues, by some time s/he has to come to grips with the main schools of thought, their strengths and weaknesses and the arguments in favor and opposed to them. This document intends on giving such a broad overview and introduces the reader to the essential debate between the different schools of thought. It was meant primarily to help myself to understand the complex discussions going on in macroeconomics, but i will surely be pleased if someone else can make use of it.

So in order to motivate the topic, let's shortly clarify what macroeconomics is all about. It essentially tries to explain the relationship between aggregate economic variables, such as *output*, *productivity*, *employment*, *money* and *inflation*. Traditionally, there have been two major research areas:

1. Research on business cycles, which aims at explaining the determinants and interconnection of fluctuations of aggregate variables in order to find ways to smooth the business cycle.
2. Finding the determinants of economic growth; this had a revival in macroeconomics in the late 1980s and 1990s, following Robert E. Lucas's 1987 address to the American Economic Association on the real costs of business cycles.

Economists have observed the following stylized facts for business cycles and economic growth. Any economic theory which ought to explain business cycles and/or economic growth needs to predict aggregate movements that are consistent with these stylized facts.

1. Output movements tend to be correlated across all sectors of the economy.
2. Procyclical:
  - (a) Production (Y), Consumption (C) and Investment (I) are procyclical and coincident.

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<sup>1</sup>This document is distilling the worked by Snowdon, Vane and Wynarczyk, *A Modern Guide to Macroeconomics*, 1994. For a more detailed discussions, the reader is warmly recommended this source.

- (b) Government purchases tend to be procyclical.
  - (c) Employment is procyclical; unemployment counter-cyclical.
  - (d) Average labor productivity is procyclical.
  - (e) The real wage is only slightly procyclical.
  - (f) Money supply and stock prices are procyclical and lead the cycle.
  - (g) Inflation (and price level) and nominal interest rates are procyclical and lagging.
3. Acyclical: The real interest rate is acyclical.
  4. Investment is much more volatile over the course of the business cycle than consumption.

Furthermore, several long-run stylized growth facts for industrialized countries were first observed first by Kaldor:<sup>2</sup>

1. The growth rate of per capita output is constant.
2. The capital output ratio  $Y/C$  is constant.
3. The rate of return on capital is constant.
4. the capital and labor share of income is constant.

Any economic growth/business cycle theory requires testing against these benchmarks to determine how well it matches real world economic fluctuations.

There are a number of fundamentally different approaches to explaining business cycles and growth. This document is about presenting these different approaches in a non-mathematical matter.

## 2 Schools of Thought

### 2.1 Today

The mainstream debate is today between the New Classical Real (Equilibrium) Business Cycle (RBC) Theory and the New Keynesian School. The former group continues the classical tradition of optimizing economic agents within a free market framework, in which competition and flexible prices ensure almost instant equilibria in goods and labor markets.<sup>3</sup> The government's role is seen as to enforce the rule of law, stiff competition and make sure that prices and wages are flexible. Any governmental interference beyond this limited set of policies is undesired and will result in prolonging any temporary state away from the market equilibrium. Contrarily, New Keynesian economists observe frequent market failures on rather grand scales, prompting for state intervention to make markets efficient.

But let's start at the beginning.

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<sup>2</sup>To see these stylized facts, long-term economic indicators need to be cleansed of short-term business cycle fluctuations. One popular method of smoothing of business cycles in macro-variables is the Hodrick-Prescott filter.

<sup>3</sup>Note that labor market equilibrium is equivalent to saying that there is full employment in the economy.

## 2.2 Classical Economics

Economic theory that was published between Adam Smith's classic *The Wealth of Nations* (1776) and the publication of John Maynard Keynes's *General Theory* (1936) is regarded as "Classical Economics". The classical period includes a wide variety of different theories and philosophies, among those Smith's notion of the Invisible Hand (market forces), Ricardo's Comparative Advantage theory on international trade, or Karl Marx's gloomy prediction of the future (read "decline") of capitalism.

It is important to note that there was no coherent and agreed theory of how the macro economy worked before the 20th century; nonetheless, three central building blocks underlie classical economics:

1. The Theory of Production and Employment
2. Say's Law: Supply = Demand
3. The Quantity Theory of Money

### 2.2.1 The Classical Theory of Production and Employment

In the classical period, there was a strong belief in almost-instant equilibrium forces that cleared labor and goods markets. This was believed to be true due to strong competition and flexible prices (i.e. prices of goods and services, interest rates and wages) which adjusted quickly to smooth out any temporary excess supply or demand of labor, goods or savings. In this framework, the government's role was restricted to ensuring that competition took place (i.e. prohibiting monopolies or trade unions that would avoid prices to adjust) and securing private property rights and the rule of law. Any government intervention beyond this restricted set of policies was said to only prolong (or thwart) the equilibrium-adjusting process.

Basic classic macroeconomic models assume two types of representative economic agents (firms and households), which are both rational and aim at maximizing their utility from profits (firms) or consumption and leisure (households). Markets are assumed to be perfectly competitive (that is, free entry and exit of firms, homogenous goods, complete information of all agents about prices and market conditions) so that prices are perfectly flexible. Market clearing prices are established before trading starts (by a fictional so-called "Walrasian auctioneer") so to avoid "false trading." Finally, expectations and preferences are constant over time. <sup>4</sup>

Then, both representative agents optimize according to their preferences embodied in their utility/profit function and hence decide how much to optimally buy/sell/produce to maximize their utility. Note that for instance an increase in the real wage has two effects: First, since the real wage increases, leisure becomes relatively more expensive compared to labor; hence, labor supply increases. This is called the *substitution effect*. Second, since agents have then more income, they can also afford more leisure - this is called the *income effect*. Classical economics assumes that the substitution effect dominates the income effect.

The conditions listed above make sure that labor, goods and savings/investment markets always clear. As a result of the labor market clearing (due to falling wages during excess supply of labor, and increasing

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<sup>4</sup>The widely used "Ramsey Model", named after the British Mathematician Frank Ramsey (1903-30), assumes for instance representative agents, complete markets and infinite horizons.

wages during excess demand for labor), there is *no voluntary unemployment*.<sup>5</sup>

More technically, every classical model starts out with a short-run aggregate production/supply function:

$$Y = AF(K, L) \tag{1}$$

where  $Y$  stands for output,  $A$  for Total Factor Productivity (TFP),  $F$  for a function that depends on the level of technology and which relates inputs Capital ( $K$ ) and Labor ( $L$ ) to output. Two crucial assumptions for the short-term production function are:

1.  $Y$  is increasing in  $A$ ,  $K$  and  $L$ .
2. There are diminishing/decreasing returns to scale in  $K$ , and  $L$ .

As a result of these two assumptions, the firms' profit is maximized when they produce where Marginal Return (MR) = Marginal Costs (MC). As long as profits exist in the short-run, the free entry of competitors will lead to further competition and price reductions till finally the market price equals marginal costs and no profits remain in the industry.

Similarly, on the labor market, competition between firms for labor (remember that labor supply equals labor demand due to assumed market clearing), will lead to a wage level that is equal to the marginal return to labor.

### 2.2.2 Market Clearing: Say's Law

How come that we can simply assume market clearing? The rationale lies in the so-called *Say's Law*, which says that labor will only be offered in order to obtain income and to purchase consumption output there from.<sup>6</sup> Put differently, since production creates income, and income creates purchasing power for the purchase and consumption of the very same output, the goods market must clear and there cannot be an impediment for full employment. Compressed, "*supply creates its own demand.*"

Say's Law can be split into two versions: The *weak* version says that the very act of producing and supplying one good of output necessitates the equivalent demand for output - either from the household that receives the wage, or - in case the household saves his income - from a firm that receives the household's savings for investment. The *strong* version of Say's Law states in addition that the aggregate spending (from consumption and investments) will be sufficient to purchase the level of full employment. This holds due to the identity

$$Savings(r) = Investments(r) \tag{2}$$

Understanding this identity is crucial to making sense of classical economics. First, equation (2) states that savings and investments are a function of interest rate ( $r$ ). As the interest rate increases, more people are willing to part temporarily from their cash/wages and to save in order to receive higher consumption in the future from savings plus interests. Hence, savings is increasing in the interest rates. To the contrary with investments: as the interest rate increases, investments become less profitable since interests need to be paid on the borrowed money. Hence, investments are decreasing in the interest rate. The interest rate in turn depends on the productivity of firms (the higher the productivity, the more firms will require

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<sup>5</sup>Note that agents optimize between labor and leisure to maximize their utility. So for a given wage, some agents may choose to work just a small share of the day and value leisure higher than the consumption they can derive for the wage.

<sup>6</sup>Jean-Baptiste Say, *Treatise of Political Economy*, 1803.

money for investments and the interest rate increases) and the thrift/preferences of the households. Consequently, the interest rate serves as an equilibrating force: if more money for investments is sought for by firms, the excess demand will lead to an increase in interests and more households will start saving money. If however there is too much savings, an excess of savings will decrease the interest rate and more firms will find it profitable to invest. Due to the self-adjusting interest rate mechanism, savings will equal investments, and all money earned in the economy by households will be spent either by household consumption or by firms' investments;<sup>7</sup> thus production creates income which in turn creates demand by households and firms.

### 2.2.3 The Quantity Theory of Money: Money is neutral

The third pillar of classical economics is that money is neutral, i.e. the amount of money circulating in the economy does not affect the optimal choices by firms and agents for investments, savings, output, consumption and leisure. Put differently, the real sector (output, employment) and the nominal sector (price level) are separated from each other. The Quantity Theory of Money is the rationale behind this.

There are different accounts of the Quantity Theory of Money (Cantillon, Hume, Ricardo, Mill, Marshal, Fisher, Pigou, Friedman); before the 1930s, the two dominant theories were the "Cambridge Cash-Balance Approach" by the Cambridge economists Marshall and Pigou, and the Money Velocity Approach by Irving Fisher.

**Cambridge Cash-Balance Approach (Marshall, Pigou)** Following Marshall and Pigou, the money demand by households and firms is just as big as these agents desire to hold cash in order to make business transactions. This is explained by the formula:

$$Money_{Demand} = k * P * Y \quad (3)$$

where  $PY$  = national money income ( $Y$ =income,  $P$ =price level), and  $k$  is the constant fraction of national money income which agents desire to hold. Furthermore, we have that

$$Money_{Demand} = Money_{Supply} \quad (4)$$

where the money supply is exogenously determined by some money authorities. Since  $Y$  is fixed in equilibrium (unless there is technological progress, or TFP; cf. above), and  $k$  is assumed to be constant, the only variable is price level  $P$ , when equation (3) equals equation (4). Subsequently, as the money supply increases, agents hold more cash; but since agents only desire to hold a fixed  $k$ -share of the national money income, the excess cash is being used for consumption. Since output  $Y$  is however fixed, too, price level  $P$  must increase proportionally to the increase of the money supply.

**Velocity Approach (Irving Fisher)** Fisher defines the velocity of cash as the average amount of times one money unit (e.g. \$1) is used in transactions.

$$M * V/Y = P \quad (5)$$

where  $M$  is the exogenously determined money supply,  $V$  is the velocity of money,  $Y$  is output and  $P$  is the price level. Since output  $Y$  is fixed (cf. above), so must be then  $V$ , and as the money supply  $M$

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<sup>7</sup>This is the opposite to Keynes' *Paradox of Thrift*, according to which an increase of savings will lead to a decrease in output and employment. More on this farther below.

increases, only price level  $P$  can adjust.

As an increase in the price level (read, inflation) occurs, real wages decrease and the marginal return of labor is higher than the real wage (resulting into profits for firms). Perfect competition and full employment finally ensure that competitive bidding between firms again raise the real wages, so that in equilibrium real wages are again at the previous level (i.e. wages = marginal return to labor). In similar fashion, real interest rates are depressed by inflation - first resulting into lower savings, then excess demand for savings from firms, finally rising interest rates to the previous level (i.e. interest rate = marginal return to capital).

Concluding, an increase in money supply  $M$  leads to higher nominal interest rates, higher nominal wages, and a higher price level. Nonetheless, real wages, real interest rates are as before so that the real equilibrium values (optimal allocations of agents: output, employment, savings, investments) remain unaffected. Thus, money is neutral.<sup>8</sup>

#### 2.2.4 Conclusion

1. Classical economics starts out from a production function, it is therefore called "supply-sided economics."
2. Representative, rational agents - firms and households - maximize their utility, which they derive from profits or leisure/consumption.
3. Say's Law ("*supply creates its own demand*") guarantees due to competition and flexible prices (wages, interest rate) that market clearing occurs in labor, goods and savings markets. Hence, the economy is self-regulating, does not need state intervention and automatically leads to full employment.
4. The real sector and the nominal sector are independent (Theory of Money Quantity). Money is neutral; changing money supply does only change the price level, but not the equilibrium values (optimal decisions/allocations of agents).

### 2.3 Keynesian Economics

The last section discussed Classical Economics that prevailed till the Great Depression. In 1936, John Maynard Keynes published *General Theory* that would complete change the economic debate and policy making for the next 30 years.

Keynes did not believe in much of Classical Economics. Foremost, with the backdrop of the Great Depression, he forcefully argued that full employment was not the normal state of the economy. He criticized that "*supply would create its own demand*" (Say's Law), that market forces would almost-instantly lead to market clearing situations and that money was neutral.

Keynes' *General Theory* has been widely debated; not least due to unclear or ambiguous wording, there are many different interpretations of his work.

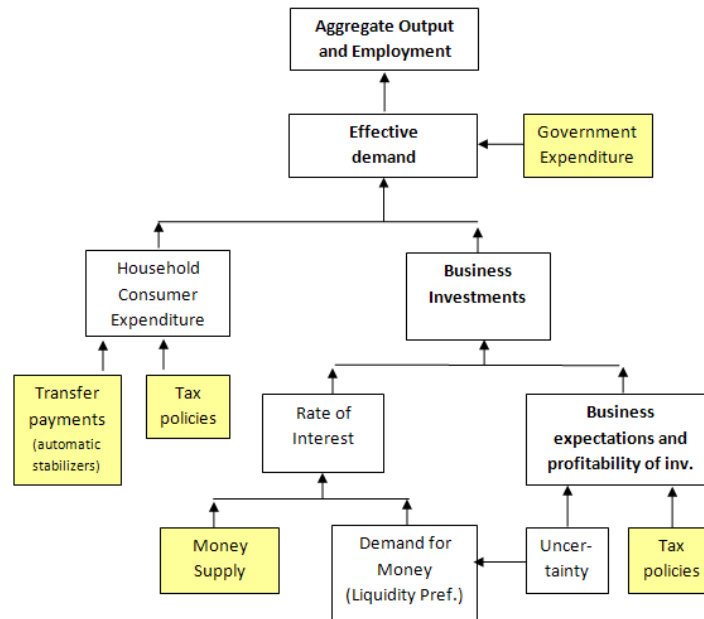
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<sup>8</sup>A caveat is due here: classical economists were only concerned with the long-run; they were well aware that in the short-run (before market forces had restored the equilibrium) prices were not at their equilibrium level. As we will see in the next section, Keynes was concerned with the short-run - because, as he famously stated - "*In the long run, we are all dead.*" The question then becomes - how long is the short-run?

### 2.3.1 Keynes' Theory of Output, Employment and Interest Rates

A central concept of Keynes' framework is *effective demand*. Following Keynes, firms and households do not simply consume/purchase everything that is supplied. Instead

1. Firms make their business investment decisions based upon the *expected profitability* (Keynes calls this the "marginal efficiency of capital") of each specific investment (i.e. "Given the interest rate, will I make positive profits with this investment?"). The expected profitability thereby consists of future expected demand as well as the current and future interest rate. Due to prevailing uncertainty in the real world, businesses' expectations of the future can be very volatile; thus, large swings in aggregate investment are possible.
2. Consumers spend money dependent on how much disposable income is available to them at the time (which is a function of the government's tax policy) as well as dependent on their marginal propensity to consume (i.e. of each additional \$1, how much will the agent spend, how much will (s)he save).



Consequently, effective demand consists of aggregated firm investments, consumer spending and government spending. Keynes continues that an increase in demand will lead to an increase of production/output (assuming that there is spare capital capacity in the economy that allows an increase in the short-run where no capital can be added). Since more output requires more labor, effective demand also increases the employment level.

Keynes further criticizes the Quantity Theory of Money: The interest rate does not only a reflection of how much cash agents desire to hold cash for transactions, but he adds to the transaction motive

a liquidity/precaution preference (due to uncertainty) and a speculative preference to hold cash. Since the profitability of investments is negatively impacted by the interest rate (the higher the interest rate, the less profitable are investments), investments (and hence effective demand) goes down with increasing interest rates. An exogenous money authority can therefore by injecting money into the economy change the interest rate and thus the profitability of investments, thus aggregate effective demand, thus aggregate output and employment. Money then is not neutral, but instead does influence aggregate variables. The real and the nominal sector are not separated, and demand creates supply - the reverse of Say's Law.

As a result, Keynes' theory sees a very different role for the government: expansionary monetary policy can reduce interest rates, hence increase investments, effective demand, output and employment. Increasing government expenditures leads to higher effective demand, output and employment. Alternatively, lowering taxes increases disposable income and thereby (adjusted by the marginal propensity to consume) household consumption and effective demand, output and employment.

### 2.3.2 The Keynesian Multiplier

Starting from Keynes' concept of *marginal propensity to consume* (consumers spend a constant fraction of their income), we get equation (6)

$$Y = c * Y \tag{6}$$

Where  $Y$  is national output/income, and constant  $c$  is the marginal propensity to consume. Combining (6) with the Resource Constraint in (7)

$$Y = c * Y + I + G \tag{7}$$

we get

$$Y = (I + G)/(1/(1 - c)) \tag{8}$$

where  $1/(1 - c)$  represents the multiplier.

### 2.3.3 Rigidity vs. Flexible Nominal Wages

Assume there is a negative demand shock hitting the economy when it has the equilibrium level of output and employment. Assume that nominal wages are rigid and not flexible. Hence, output decreases and employment decreases. Since nominal wages are still at the same level, though, there is more labor supply than labor demand and involuntary unemployment occurs. There are two possibilities to solve unemployment:

1. The classical way of letting wages drop, or
2. letting the price level increase.

Note that in both cases real wages drop, and subsequently households provide less labor at the new real wage, while simultaneously firms will want to employ more labor. Keynes argues for policy (2) by increasing aggregate demand to exert upwards pressure on the price level for the following reasons:

1. Practically:
  - (a) The relative wage differences between households remain unchanged.

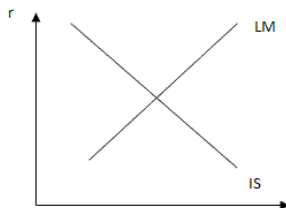
- (b) Since wages are agreed upon by firm and workers/unions through contracts, wages cannot adjust instantaneously. Union/worker struggles will be wasteful and cause additional harm.
  - (c) No agent can intervene against an increase in the price level. It's less sudden and more hidden.
2. Theoretically:
- (a) Liquidity Trap
  - (b) Interest-Inelastic Investment Schedule

### 2.3.4 The Orthodox Keynesian School

The central beliefs of the Orthodox Keynesian School are:

1. The economy is inherently unstable; shocks occur frequently, primarily from changes in profitability expectations.
2. The economy is not rapidly self-equilibrating.
3. Aggregate output and employment is primarily determined by effective demand.
4. The government has an active role to bringing full employment by (a) creation of demand, (b) monetary policy, (c) fiscal policy. Fiscal policy is preferred to monetary policy since it is more direct and instant.

**IS-LM analysis** The so-called IS/LM analysis <sup>9</sup> has become the conventional way of analyzing effects.



#### *The goods market and the IS curve*

The IS curve traces out all combinations of interest rates  $r$ , and national income  $Y$ , in which the goods market clears (that means investments = savings, hence "IS"). The goods market clears whenever total supply = total demand = household consumption + firm investments + government expenditures, where government expenditures are assumed to be exogenously determined. As the interest rate falls, investments go up and hence output, employment and national income  $Y$  increases. Hence the falling slope of the IS-curve. The slope of the IS curve depends on how interest-elastic are investments as well as on the multiplier (hence, the marginal propensity to consume). Put differently, if few firms/investments react to a drop in interest rates (little interest elasticity of investments), then little new output and income is created and hence the IS curve is steeper. Furthermore, the new income generated from a drop of the interest rate is used by households in consumption and savings; how much goes into consumption depends on the marginal propensity to consume  $c$ , which is reflected in the multiplier  $1/(1-c)$ . The more of the newly generated income is used in consumption, the more demand (and hence output and employment)

<sup>9</sup>by Hicks: *Mr. Keynes and the Classics: A suggested Interpretation*, 1937.

follows; thus, the lower the multiplier, the steeper the IS curve.

Let's look at the two extreme cases of the IS curve being horizontal or vertical. If the IS curve is horizontal, then any drop of the interest rate will shift the equilibrium (the cross point with the LM curve) by the maximum amount possible to the right: in this case, there is total interest-elasticity of investment and a multiplier value of 1. If the IS curve however is vertical, then investment is totally inelastic to interest rate changes and no new investments occur (thus, there is no more income and we cannot say anything about the value of the multiplier).

Finally, note that the IS curve is drawn for some given level of government expenditure, taxation and expectations. If government increases its expenditures, the new demand will increase output, employment and national income  $Y$ , and due to the higher  $Y$  the IS curve shifts to the right. If a reduction in taxation increases disposable income of households, then - dependent on the size of the marginal propensity to consume/the multiplier - consumption will increase, and thus output, employment and again national income  $Y$ ; the IS curve shifts to the right. If business expectations suddenly improve, then the marginal efficiency of capital (i.e. profitability of investments) improves, prompting more investments by firms and increasing effective demand, thus output, employment and national income  $Y$ ; the IS curve shifts to the right.

#### *The money market and the LM curve*

The LM curve traces out all interest rate/national income combinations, in which the money market clears. The money market clears, if the Money Supply (exogenously determined by some money authorities) = the Demand to hold Cash (=the demand for cash due to transactions, a liquidity/ precaution preference due to uncertainty, and speculation). Treating money supply as exogenously given, the higher the national income  $Y$ , the higher the demand for cash needed for transactions and needed for precautionary reasons. Since money supply is however fixed, a higher interest rate follows; thus, we have an upward sloping LM-curve. The slope of the LM-curve depends on the interest-elasticity of demand for money/cash.

Let's take a look at the two extreme cases, where the LM-curve is horizontal or vertical. In the case of a vertical LM-curve, an increased national income  $Y$  will create more demand for cash holdings; since money supply is fixed, a clearing would usually require a higher interest rate; not in this case: with a vertical LM curve, we have that the money market clears at any interest rate. Hence, the demand to hold cash is totally interest-inelastic. This case is called the "classical range." In the other extreme where we deal with a horizontal LM-curve, we have what Keynes called a "liquidity trap". A liquidity trap is a situation in which a reduction of the interest rate does not result in more savings and less demand for cash. Imagine a situation in which the interest is very low. In fact, the rate is so low that every agent thinks that it can only go up in the near future. Hence, no agent puts cash into a long-term bond/ a savings account with a fixed interest rate, but instead holds on to the cash to wait till the interest rates rise. This is called a "liquidity trap." One can quickly see that in such a situation, monetary policy to increase money supply (hence lowering the interest rate) will not have any affect; agents will continue to hold on to the cash. We'll see this in more detail in the next section.

#### *The Role of the Government: Fiscal and Monetary Policy*

Assume a situation in which the money market and the goods market are in equilibrium, that is - we have a  $(Y,r)$  combination such that the LM und the IS curve cross. Assume further there is full employment. Suddenly - for whatever reasons - business expectations become gloomy and firms shelve planned investments due to lower expected future profitability of investments. Hence, there is an effective demand shock and output, employment and income goes down. With involuntary unemployment, what can the state do to come back to a state of full employment?

According to Orthodox Keynesianism, there are two possibilities: (1) a monetary policy to increase or decrease the supply of money on the market, or (2) a fiscal policy such as increased government expenditures to boost effective demand or a decrease in taxation to increase disposable household income and hence increase consumption. Let's look at each action individually:

#### *Monetary Action*

Increasing the money supply will decrease the interest rate (since more money is in the market available) and hence make investments more profitable. Assuming that the money market will stay in equilibrium, the LM curve will shift to the lower right. If the IS-curve is horizontal or decreasing, this will increase output, employment and national income  $Y$  (the exact amount by how much depends on the shift of the LM curve as well as the steepness of the IS curve (the flatter the greater the increase). If the IS curve is however vertical, then investments are totally inelastic towards interest rate changes - no change in  $Y$ , output or employment will occur. So the monetary policy will fail here.

#### *Fiscal action*

Assume the same initial situation in this case: money and goods markets are in equilibrium as a demand shock (e.g. through worsening business expectations) hit. Increasing government expenditures will shift the IS curve to the top right, thereby increasing effective demand. Increasing disposable income of households by cutting taxes will also increase effective demand from households and shift the IS curve to the top right (the size of the shift depends on the increase of the disposable income and the marginal propensity to consume/multiplier). In the limiting case of the LM curve being vertical ("classic range"), fiscal expansion does not have any effect on output, employment and income, as the rise of the rate of interest reduces firms' investments by an amount identical to the increase in governmental expenditures (crowding out).

In Orthodox Keynesianism, the monetary approach was favored as money demand was seen as faster reacting than investment decisions when interest rates fell. This view changed in the 1960s as evidence pointed out that the monetary policies were actually much weaker and more imprecise than fiscal methods.

### **Criticism**

Critiques (in particular Monetarists) have pointed out that in the case of fiscal policies (and with no monetary policies to broaden money supply) the money the government uses for the fiscal policy (either government expenditures, or indirectly when cutting taxes) need to come from somewhere. Two sources can be the sale of bonds, or increased taxation. Barro (1974) argues in the Ricardian Debt Equivalence Theorem that there is no difference between selling bonds or increasing taxes. Following his rationale, rational households will foresee the future tax liability arising from the sale of governmental bonds and hence instead of using up the higher income today for consumption today, they will save it to pay future higher taxes to repay the bonds and their interests. Tobin (1980) and Feldstein (1982) offer good counter-arguments that (1) even if some parents gave bequests to the next generation to pay these future taxes, most do not do so and hence government debt can make one generation richer at the cost of the other. (2) Governments often have more favorable access to capital markets with lower interest rates than private households; if the properly discounted net value of a governmental bond costs less in interests than a private sector debt would cost, then there is net wealth effect for society.

### **The "Keynes Effect" and the Keynesian Model of Perpetuated Underemployment**

In the general IS/LM analysis with flexible wages and flexible prices a situation of involuntary unemploy-

ment is self-curing:

Excess supply of labor  $\rightarrow$  real wages drop  $\rightarrow$  costs for firms drop  $\rightarrow$  prices (of goods) drop  $\rightarrow$  price level drops  $\rightarrow$  real money demand increases (LM curve shifts outwards to the right)  $\rightarrow$  excess income is channeled into savings  $\rightarrow$  interest rates go down  $\rightarrow$  investments by firms increase  $\rightarrow$  more output and employment  $\rightarrow$  unemployment is gone.

This effect of falling wages and prices which increase spending and demand via the interest rate is called the "Keynes Effect."

In the limiting case of a "liquidity trap" (horizontal LM), this self-curing mechanism however stops working: due to the horizontal LM, excess income is not channeled into savings and interest rates cannot go down. Thus, the link breaks and unemployment endures.

## 2.4 The Orthodox Monetarist School

The Orthodox Monetarist School sought to re-establish the belief that money/money supply is central to growth (national income). Monetarists thought this to be necessary since (a) in the classical Quantity Theory of Money, money was neutral, and (b) in Keynesian Theory monetary policies were ineffective in the two cases of a liquidity trap and an investment trap.<sup>10</sup>

The Monetarist School was established in three stages and through three central results:

- Stage 1 (mid 50s): The Quantity Theory of Money (Friedman, 1956; Friedman & Schwartz, 1963)
- Stage 2 (mid 60s): The Expectations-Augmented Phillips Curve (Friedman, Presidential Address to the AEA, 1968)
- Stage 3 (mid 70s): The Monetary Approach to Balance of Payments Theory and Exchange Rate Determination (Johnson, 1972; Frenkel & Johnson, 1976, 1978)

### 2.4.1 Stage 1: The Quantity Theory of Money

Milton Friedman (1956) analyses the demand of money using an IS/LM analysis. He asserts that the demand for money is a function of

1. an individual's permanent income (as a proxy for total wealth which is the budget constraint/maximum for money demanded)
2. the returns on different financial assets (money is regarded as one of the available assets)
3. the expected rate of inflation
4. the individual's preferences, tastes (e.g. risk aversion)

Friedman states that a utility-maximizing agent will reallocate his wealth (including cash money) in such a manner between different assets that the marginal rates of return are equal between all assets. Hence, with an increase of money in the market (as a result of an open monetary operation of the money authorities), the rate of return to cash will fall and thus the individual will change his portfolio to reestablish the equilibrium from having equal marginal rates of returns of all portfolio assets. This

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<sup>10</sup>Recall, in a liquidity trap agents keep all their cash and do not save/invest because they expect rising interest rates; in an investment trap investments by firms are totally interest-inelastic, hence any change of interest-rate does not affect firms' investment behavior. Thus increasing money supply does not result in any change in national income, output and employment.

differs from Keynesian Theory inasmuch that in Keynes other financial assets have no impact on the holding of cash. As a result, monetarists see a much stronger and more direct impact of monetary policy on aggregate spending.

Friedman tried to back this up with several empirical papers, e.g. one in which he shows that money supply changes preceded U.S. growth changes between 1870 and the 1950s, suggesting a direct money impact on economic growth. The study has been repeatedly questioned on econometrical grounds, for instance in that Friedman's results were not replicable with the same data and that the causal relationship between money and growth was insufficiently shown (e.g. Culbertson 1960 & 1961; Kareken and Solow, 1963).

Monetarists' conclusions by the mid-50s were:

1. changes in the money stock are the predominant factor to explain changes in money income
2. the lag between changes in the money stock and changes in the growth performance are long and vary, hence fine-tuning of the economy through monetary policies is not possible
3. money supply should be allowed to grow at a fixed rate in line with the underlying growth of output to ensure long-term price stability

The point/result of the Keynesian-Monetarist debate between the mid 50s till mid 60s was that Keynesians were not wrong, but instead had underestimated the effect of monetary operations on the economy.

#### 2.4.2 Stage 2: The Expectations-Augmented Phillips Curve

In a seminal study, Phillips (1958) found an inverse relationship between unemployment and money wages between 1861 and 1957 in the UK. At a unemployment level of 5.5%, there was 0% change in money wages; at an unemployment level of 2.5% there were 2% growth of money wages. The rationale was simple: the less unemployment, the stronger the demand for labor by industries and thus workers/unions can push up wages. On the other hand, if unemployment was greater than 5.5%, then workers would be willing to work for lower wages, hence declining wages.

The resulting policy dilemma: a long-run trade-off between inflation and unemployment. Orthodox Keynesians regarded this as convenient option for public policy for possible inflation-unemployment combinations.

By the late 1960s and 1970s, however, the oil crises combined with influx of petro dollars into the global financial system created a new, previously unobserved economic phenomenon: simultaneous inflation and unemployment - "stagflation" - contradicting the underlying stable relationship the Phillips-Curve had predicted. Friedman and Phelps pointed out this contradiction, with the seemingly consequence that money wages were determined independently from the price level; this has been called *money illusion* by workers.

In 1968, Friedman argued that because wages were agreed upon before inflation took place, the predicted money wage change in the Phillips-Curve would require expected inflation as an input parameter; hence the equation would become:

$$\Delta wage = \beta_1 f(unemployment) + \beta_2 expected_{i}nflation \quad (9)$$

$\beta_1$  proved insignificant and  $\beta_2 = 1$ , so that there is no real relationship between wage change (wage inflation) and unemployment, but instead inflation expectations were the key to understanding wage inflation. This was accepted by most Keynesians by the mid 1970s. Friedman continued to argue that if the money authorities wanted to bring the unemployment rate below the "natural unemployment

rate”<sup>11</sup> by expanding the money supply, it would need to raise real inflation above the expected wage inflation of workers. (As a result, real wages would be below the equilibrium wage with the natural unemployment rate and firms could hire additional labor.) Assuming that in a repeated game, workers had adaptive/error-learning expectations, workers would adjust their inflation expectations in the next wage negotiation round by increasing their expectation of inflation. In turn, in order to keep the unemployment rate below the natural rate, the money authorities would again need to achieve a higher real inflation than workers expected. This would lead to a hyperinflationary situation and became known as the *Accelerationist Hypothesis*.

Concluding, the Monetarists standpoint – that is, Friedman’s policy prescription to keep monetary expansion at the same steady rate as long-run growth rate of the economy – is based on the following beliefs/arguments:

1. If the money authorities expand money supply at a steady rate, the labor market will clear at the natural unemployment rate.
2. The adoption of a clear monetary policy rule will erase the greatest source for inflation volatility in the economy: false expectations. The economy is assumed to be stable around the natural unemployment rate.
3. Expansionary monetary policies are dangers, because
  - (a) no one knows the natural unemployment rate and increasing the money supply may lead to the vicious circle described in the Accelerationist Hypothesis.
  - (b) the varying lag and differing intensity from an expanding money supply onto the market can create more harm than good.

Hence, the best policies from a monetarist viewpoint the government can do is to

1. adopt a firm rule of money expansion
2. try to lower the natural unemployment rate by trying to get lessen market imperfections (creating incentives to work through the reduction of marginal tax rates on labor income, lowering unemployment benefits and social benefits, allowing wages, prices and work conditions to be flexible, reducing mobility costs and informational costs, ...)

### 2.4.3 Stage 3: The Balance of Payments

#### The BoP under a fixed Exchange Rate Regime

Monetarists believe that there is a self-regulating mechanism which offsets an increased domestic money supply, hence not leading to increased domestic inflation. The theory goes as follows: Assume a small open economy with fixed exchange rates which operates along its equilibrium with the natural unemployment rate in the labor market. Total domestic money supply is defined as the total amount of domestic money plus international reserves times their fixed exchange rates. (International reserves can be sold under a fixed price regime in exchange for domestic money that other countries hold as their international reserves.)

Now suppose the money authorities are increasing the supply of domestic money. While in the closed economy, the real value of the money would fall, in the open economy household can purchase goods

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<sup>11</sup>Friedman defines the “natural unemployment rate” as the rate that a Walrasian system would give under labor market clearing when real structural characteristics (market imperfections) such as stochastic variability in demands and supplies, costs of gathering information for job seeking and labor availability, costs of mobility, etc. were included.

and services from abroad. Now assume that they will do so with all the excess cash they hold beyond what they want to hold. As a result, the state occurs a negative balance of payments. Given the fixed exchange rates, the state is committed of buying back all the money that has been spent for foreign goods and services, paying with international reserves, so that at the end, the total money supply consistent of domestic money plus international reserves times their reservation prices will be again the same as at the beginning. Thus, any increase in domestic money will be exactly offset by a decrease of international reserves, and monetary policy will have no effect on domestic inflation, interest rates or output growth.

### **The BoP under a flexible Exchange Rate Regime**

Ceteris paribus, an increase in domestic money supply increases (given that due to arbitrage there can only be one international interest rate) demand for foreign goods and services. The excess supply of domestic money on the international financial market leads to a depreciation of the currency, making foreign goods and services more expensive and thus increasing the domestic price level. Inflation means decreasing real value of cash, and thus households and firms will increase their cash holdings thereby resulting in a new money market equilibrium with a depreciated currency. Note, however, that if all countries expand their money base by the same relative amount simultaneously, then no depreciation will happen.

Furthermore, ceteris paribus, a higher relative expansion of the money supply compared to the other country, or a lower relative increase of real income growth compared to another country will also lead to the depreciation of one's currency.

### **Conclusion**

Monetarists distinguish themselves from Keynesians foremost in their adversary to activist stabilization policies (fiscal or monetary). While Keynesian are convinced that monetary and fiscal policies can and should be applied to stabilize the economy and assure full employment, Monetarists are convinced that there is no need for any stabilization policy because the economy is inherent stable and returns by itself to the natural rate of unemployment. In addition, even if the economy wasn't stable inherently, fiscal or monetary policies could not have the desired effects (acceleration hypothesis, no one knows the natural rate of unemployment, the lag and volatility of the impact on the economy from any monetary or fiscal policies are unknown). Hence, the only monetary policy ought be a consistently increase in the money supply in synch with long-term growth in output, while fiscal policies should be used for redistributinal purposes only.

## **2.5 The Return of the Classicists: New Classical Economics**

New Classical, New Classical, Economics is based upon three pillars:

1. The Rational Expectations Hypothesis (REH)
2. Continuous Market Clearing
3. The Aggregate Supply Hypothesis

It is often seen as a continuation of Orthodox Monetarism a la Friedman, extended by the concept of Rational Expectations.<sup>12</sup> (e.g. by Lucas)

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<sup>12</sup>Barro (1984) writes that the word "Rational" was deliberately chosen in order to bring opposing economists into the defense; every opposing economist could then be labeled as "irrational" or modeling "irrational" agents.

### 2.5.1 The Rational Expectations Hypothesis (REH)

The central idea of the hypothesis is that economic agents will form their expectations about future aggregate variables (e.g. inflation) based upon the best (that is most efficient) use of all available information to the public. In other words, agents are maximizing their utility using the best expectations they can form given publicly available information. Note that this is obviously different from perfect foresight. Moreover, REH postulates that the error of the expectation will be 0 and will not be serially correlated, that is to say, (1) in average, agents will have correct predictions, (2) agents will not form systematically wrong predictions, and (3) past predictions and outcomes do not influence future predictions. The latter point contrasts to adaptive expectations in which current expectations are influenced by past expectations and outcomes. Therefore, adaptive expectations are also called "backward-looking expectations" versus rational expectations to be "forward-looking."

Criticism that has been voiced include:

- |           |  |
|-----------|--|
| Criticism | It is impossible (too costly in time, money and effort) to use all public information.   |
| Response  | REH doesn't require to do so: First, it only talks about the "most efficient" way of using all available information. Second, it's unlikely that all information will ever be used (much of it is irrelevant). Third, not every agent has to do the whole analysis personally. |
| Criticism | There's uncertainty involved in regard to (a) which information is relevant, and (b) which model is the correct one of the economy.  |
| Response  | (a) is true. (b) Agents do not have to have the 'correct' model of the economy; rather, they only do not form systematically wrong expectations over time.   |

### 2.5.2 Continuous Market Clearing

Walrasian market clearing is assumed at any point of time. Thus, new classical models are referred to as 'equilibrium models.' As described earlier, this is distinctly different from Keynesian models, where market clearing could take such a long time that market conditions have already changed again and so economy might be able to stay in a constant disequilibrium. Monetarists - as being much closer to the New Classics - are convinced that price adjustment processes are much faster than Keynesians assume and that market clearing will happen fairly quickly; hence, from a monetarist viewpoint, markets may be in disequilibrium in the very short-run, but return to the equilibrium with the natural rate of unemployment and output in the long-run.

### The Aggregate Supply Hypothesis

The hypothesis states that economic agents are optimizing their behavior according to the relative prices and their preferences. In respect to labor, workers will supply labor such that the marginal rate of return to labor (derived from consuming the marginal real wage) is equal to the marginal return of leisure. With a perceived temporary decrease in the real wage, labor may decide to favor current leisure in exchange for labor, whereas agents will then work more later when the real wage has again increased and cut down on leisure. This is called *intertemporal substitution*. A problem exists due to the fact that agents cannot observe all market prices simultaneously; hence, an increase in the relative price of a firm's good may represent either a real increase of demand in its good (in which case the firm should increase production) or however a general price level increase in all markets (and thus the firm should

not increase production). Finding out what is the case is called the *signal extraction problem*. From this, Lucas constructed a *surprise supply function*:

$$Y = Y_N + \alpha(P - P^e) \quad (10)$$

where  $Y_N$  is the output at the natural rate of unemployment, and  $P^e$  is the expected price level. This explains business cycles in which output and employment can be above their natural rates when actual inflation is higher than expected inflation. Only when the *expected* price level exactly equals the *actual* price level will output (and thus employment) be at their natural rates. With the "surprise supply function", Lucas had solved an old problem: incorporating cyclical fluctuations into an equilibrium-based theory. Finally, the observation that during a business cycle's upswing (downswing) output and employment overshoots (undershoots) the trend value that would have been expected from earlier periods has been explained with mechanism that restrict immediate adjustments to price (e.g. wage rigidities, restrictions to laying off labor, stocks of goods that need first to be sold off before prices can rise); hence, the optimal policy for economic agents may be a gradual rather than an immediate response to the changed economic environment from some form of an unanticipated shock.

### **Policy Implications**

Combining the Hypotheses of Rational Expectations, Continuous Market Clearing and Aggregate Supply leads to four policy conclusions:

#### *The Ineffectiveness Proposition of Monetary Policy:*

If the money authorities announce an increase in money supply (either directly, or through a publicly-known decision rule), economic agents will take this into account and change wages and prices accordingly, leading to a higher price level with no effect on output or employment. (Money becomes "neutral" again.) If the money authorities do not announce the increase of the money supply, firms and workers will get the wrong impression of an increase in real demand and real income; hence, output and employment will rise in the short-term. In the long-term, however, as firms and workers realize that there is only a relative and not absolute increase in prices, output and employment will come down to the natural rate again (and we have a business cycle). Empirical evidence found evidence in favor as well as against the proposition. Mishkin (1982) and Gordon(1982) for instance found evidence that both - unanticipated as well as anticipated money supply increases - affected output and employment in the long run. So mixed results exist on this hypothesis.

#### *The Debate on the Costs of Inflation Reduction:*

When reducing inflation, output (GDP) decreases due to a lower money supply, and consequently higher interest rates and less demand. This ratio is called the sacrifice ratio.

*Keynesians* see the ratio as rather large not only due to the increasing costs of investments from higher interest rates, but also due to the "hysteresis effect" which may occur as entrepreneurs develop gloomy expected profitability rates. Hence, (Post-) Keynesians advocate to use temporary fiscal policies (tax rebates) to offset the costs from the reduction of inflation.

*Monetarists* estimate the costs to depend on (a) the extent of the money contraction, (b) the flexibility of prices to decrease, and (c) the expectations on future inflation rates (which in turn depend on the credibility of the money authorities to follow through).

*NewClassicists* argue that - given the monetary policy is credible - there are no costs (a zero sacrifice ratio) - at all, because all agents will immediately adapt their inflation expectations and will change the prices (which are assumed to be totally flexible) to reflect these expectations right away.

#### *An Independent Central Bank:*

Following the monetarists, a clear monetary rule that has expansion at the same level with output growth is most beneficial, because (1) no one knows the natural rate of unemployment and using expansionary monetary policies to push unemployment below the natural rate can start off a spiral (Acceleration hypothesis); (2) monetary policy is too crude of an instrument due to unknown time lags and size of effect; (3) finally, monetarists distrust governments in general and prefer the market mechanism.

Accepting that money supply expansions should be clearly announced, Kydland and Prescott (1977) show that when the government announces a monetary strategy and the economic agents optimize accordingly, the government then has an incentive to deviate from their announcement - the difference between the ex-ante and ex-post optimality is called "time inconsistency." Further, since this is a repeated game, there are long-term costs from losing credibility if the government indeed deviates during (for example) elections to boost employment and incomes. Hence, in order to guarantee price stability and avoid spiraling inflation, a firm commitment/mechanism is needed. Monetarists and New Classicists argue that an independent Central Bank is best suited for this, since one does not actually want to lose the possibility from monetary policies during some extraordinary macroeconomic shocks when unchangeably setting a mechanism through (e.g.) the constitution.

#### *The Role of Microeconomic Policies to increase Aggregate Supply:*

Since New Classicists assume Continuous Market Clearing, the economy will always end up by itself at the equilibrium (ie. at the natural rate of unemployment/output). Any monetary policies to change this are futile (cf. Ineffectiveness Proposition). The governmental goal must therefore be to lower the natural rate of unemployment/output by making markets more effective. Recall that the natural rate of unemployment is defined as the rate which occurs when we allow for structural shortcomings of the market such as price and wage rigidities, imperfect information, etc. Consequently, the government needs to increase price flexibility and information awareness throughout the market by e.g. lowering unemployment and social benefits, decreasing labor rights (easier to hire and fire workers), increasing social mobility, decreasing marginal taxation rates on income, etc. to create more incentives to work.

Finally, we shall quickly present the Lucas Critique of econometric policy evaluation: Lucas (1976) attacks econometric policy evaluation which requires *ceteris paribus*. He argues that changing one of parameters of the models (the one that is related to a policy that shall be evaluated) leads - due to rational expectations of the economic agents - to a change in other (behavioral) parameters of the models. By assuming *ceteris paribus* ('everything else equals') however, the analysis becomes according to Lucas flawed.

### **Conclusions**

The Rational Hypothesis has been fairly accepted by most economists today. Dispute however continues over the policy conclusions drawn from this and the other hypotheses. (1) The Ineffectiveness Proposition of Monetary Policy is called into question since (a) empirical evidence has been mixed, and (b) economic agents today can find out about the current inflation and monetary supply at a very low price (news, government statistics). (2) The Continuous Market Clearing Hypothesis remains under scrutiny, not least for the reason that there are Keynesian models that allow agents to have rational expectations, do not assume market clearing and arrive at the conclusion that demand management policies do have an effect (as confirmed by empirical analyses). This holds as long as the government can adjust its policies quicker

than the public can adjust the price level (ie. adjust wages and prices). Finally, it has been shown that the costs (in terms of a reduction of output and employment) of reducing inflation are real (and possibly even exacerbated by the hysteresis effect) and thus money is not neutral (as supposed by New Classicists).

## 2.6 New Keynesians

It is crucial to realize that classical and new classical economics assume (continuous) market clearing, whereas Keynesians assume there is no imminent market clearing. Assuming immediate market clearing in the labor and goods market then - by the very assumption - there can never be a role for some form of demand management policies since demand always equals supply. Keynesians however argue that prices and wages are sticky (ie. not flexible) due to structural characteristics of the economy (for examples, see below) and that while market clearing will happen in the medium or long run, it does not occur in the short-run. Hence, if the government is able to create demand management policies faster than prices change in the markets, then there is automatically a role for demand managing policies.

The (traditional) Keynesian School was challenged by New Classicists on the grounds that there was no micro-based theory of aggregated supply, in which price and wage rigidities could be rationalized. In other words, if we accepted rational, utility-maximizing agents, then how could there be no market clearing? To illustrate this in regard to wages: assume an economy in equilibrium with employment and output at their *natural* rates.<sup>13</sup> Let this economy be hit by some exogenous shock such that the supply curve shifts to the left due to higher prices (e.g. increase in the oil price increasing unit costs). As a result output and hence employment decreases. Why, New Classicists ask, would the newly-unemployed then not accept some lower level of wages at which the unemployed workers would again be immediately employed and the natural rate of employment and output would be reinstated?

Keynesians argue that diverse market imperfections prevent this from happening resulting in sticky wages, such as agreements with unions may prevent from firing workers or to set wages for newly employed workers below some minimum, imperfect information of firms about unemployed workers, different skill-requirements of firms versus those offered by unemployed workers, etc. Moreover, Keynesians argue that if demand has decreased due to higher goods prices (originating from higher oil prices and increased unit costs), then hiring a new worker will not automatically increase the demand for one's product again; in other words: Keynesians do not believe in Say's Law, according to which supply creates its own demand. Instead, following Keynes logic of effective demand, demand creates supply: only if firms see a positive expected profitability of investments then they will undertake new investments such as hiring workers.

New Keynesians argue that a business cycle based on the *failure* of markets is more realistic than one that assumes perfectly working markets. To contest New Classicism, New Keynesians were foremost occupied to find some micro-based theory of rational individuals which could explain the price and wage stickiness. In the 1980s and 1990s, New Keynesianism was mostly prevalent at universities along both coasts (MIT, Stanford, Harvard, Berkeley, Columbia; hence also called "*Saltwater*" economics)<sup>14</sup> whereas New Classicism and Real Business Cycle theorists could be predominantly be found in institutions close to the Great Lakes (Chicago, Rochester, CMU, Minnesota; and was hence called "*Freshwater*" economics). In addition, European schools (Stockholm, LSE, Oxford) had remained mostly Keynesian and saw a greater

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<sup>13</sup>Recall that Friedman defines the "natural unemployment rate" as the rate that a Walrasian system would give under labor market clearing when real structural characteristics (market imperfections) such as stochastic variability in demands and supplies, costs of gathering information for job seeking and labor availability, costs of mobility, etc. were included.

<sup>14</sup>Some of the "saltwater" economists in the 1990s included: Summers and Mankiw (both Harvard), Blanchard and Fischer (both MIT), Phelps (Columbia), Bernanke (Princeton), Akerlof and Romer (Berkeley), Stiglitz (Stanford).

role of unions in explaining wage rigidities.

Mankiw and Romer (1991) define a theory to be New Keynesian if the following questions are both answered affirmatively:

1. Is money non-neutral?
2. Are market imperfections crucial to understanding economic fluctuations?

Question 1 implies sticky prices, whereas Question 2 explains the behavior of those prices. Common features of New Keynesian theories are ...

1. monopolistic, price-setting behavior of firms rather than perfect competition
2. rational expectations,<sup>15</sup>
3. macro instability can result from both - demand and supply shocks
4. market/coordination failures and externalities
5. rigidities/stickiness are either "nominal" (prices cannot adjust the nominal value for some reason), or "real" (real prices cannot adjust correctly, for example one price is sticky towards another, etc.)

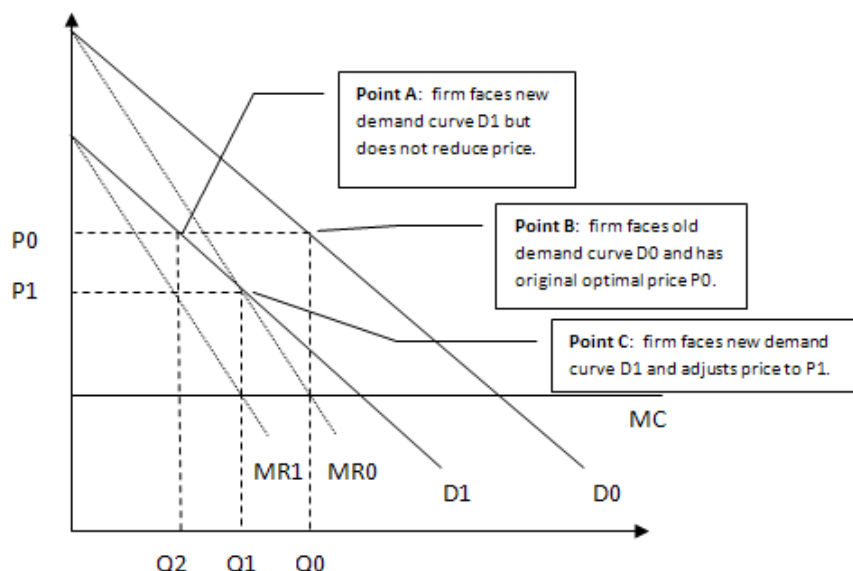
### 2.6.1 Price rigidities

<sup>16</sup> In new classic models perfectly competitive markets are assumed and hence firms become *price-takers* (price equals marginal costs and profits are zero; a firm which increases the price will sell zero, a price which reduces the price will have losses). Contrary to this, New Keynesian models assume imperfect markets, in which firms are *price-makers* and accumulate profits. In order to explain price rigidities, New Keynesians argue that a price change imposes costs such as printing new catalogues and price lists, renegotiating contracts with suppliers and purchasers, etc. - these costs are referred to as *menu costs*. As a firm then faces a demand shock (in the chart: curve  $D_0 \rightarrow D_1$ ), its optimal choice (Marginal Costs = Marginal Revenue) would lead to a lower price ( $P_0 \rightarrow P_1$ ), and consequently to a lower output ( $Q_0 \rightarrow Q_1$ ) and thus to lowered profits. If the firm does not lower its sales price but keeps  $P_0$ , it needs to decrease its production from  $Q_0 \rightarrow Q_2$ , and thus will have lower profits, such that. The profit from changing the sales price is then. If however the menu costs (the costs of changing the price) are greater than, then it will not be beneficial to a rational, utility-maximizing firm to reduce its price; hence, prices become sticky. Note, that this outcome may not be socially optimal; if all firms behave this way, and large macroeconomic fluctuations can be created from this (Blanchard and Kiyotaki, 1987).

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<sup>15</sup>Some Keynesian and even orthodox monetarist economists still are critical towards empirical evidence for the rational expectation hypothesis (e.g. Blinder, Phelps, Laidler)

<sup>16</sup>e.g. Gordon, 1990; Romer, 1993



In a different model, Akerlof and Yellen (1985) show that a "near-rational" behavior of firms may lead to the same result even in the absence of menu costs. In this model, a near-rational firm may forego a slight profit increase by keeping its prices. These theories have been called PAYM insight.

We can list several intuitive reasons why businesses are unwilling to change its prices frequently.

1. Uncertainty:

- (a) long-term price contracts with suppliers minimize uncertainty and hence ...
  - i. allow for efficient resource planning of capital and labor (e.g. finding the optimal capital-labor ratio, finding the right amount of overtime and shifts, ...)
  - ii. allow a firm as a consumer of input goods to forecast its future sales prices,

Thus, firms supplying intermediate goods to other firms are bound to keeping prices fixed.

- (b) Input-Output tables: For a price-setting firm, the information required to rationally set its own price at the new equilibrium level is implausible (Gordon, 1981): not only does the firm need to know its own demand and cost curve, but also it needs to correctly predict the pricing behavior of all its supplying firms, the suppliers of its suppliers, etc. To be able to do so, the firm needs to know the demand and cost curves of all those firms, their cost curves, their strategy to pricing, as well as all the macroeconomic variables (inflation, etc.) that may have an effect on all the cost curves. Lowering one's price on the anticipation of these price changes would be outright foolish; instead, a firm may wait till its costs for inputs are actually decreasing; hence, there is at best a time window till price changes trickle down to all the firms, and hence, the price level will take time to adjust and there's no imminent market clearing. Prices are sticky.

- 2. Customer Markets: Suppliers don't want their customers to search the market frequently for better prices. A constantly changing price schedule will however prompt customer to search more often than a constant price schedule. Moreover, a price increase will be noted by customers (and possibly

prompt a new search on the supply market) , whereas a price decrease will take much time to reach customers of competitors; thus, there is an interest in keeping prices constant (high). If many firms do so, this will reinforce this trend.

3. Capital Market imperfections: While during a boom, a firm is flushed with internal cash to finance investments, it typically requires external finance during a recession. External finance, however, is more expensive due to the information asymmetry between lender and borrower on the expected return of the investment; thus if costs of capital are counter-cyclical, so are costs and thus the price level is higher during recessions and in booms, deepening business cycles. (Bernanke and Gertler, 1989; Romer, 1993)
4. Price as a Quality Signal: Firms may be hesitant to lower its prices since the price may serve as a signal of quality in a market where consumer have imperfect information on the good. (Stiglitz, 1987)

### 2.6.2 Wage Rigidities

In order to have real wage rigidities,<sup>17</sup> a theory needs to explain why an unemployed worker will not accept a lower wage offer in order to get immediately re-employed. During the 1980s and 1990s, a variety of theories have been suggested why this might be the case:

1. Long-term wage contracts: Fischer (1977) and Taylor (1980) introduced long-term wage contracts into a Keynesian model with rational expectations to show that in the short run, there wage stickiness will occur. Reasonably assuming that the government can adjust its policies faster than wage contracts can be renegotiated, a role for demand management policies for the government is reestablished. The two models showed that rational expectations were possible in Keynesian models and that the defining difference between Keynesian and new classical models was in fact market clearing - a result with which Keynesians could very well live. Two reasons why firms and workers may prefer long-term contracts are:<sup>18</sup>
  - (a) Firms need to be able to forecast productivity and wage costs to determine sales prices in contracts; totally flexible wages(as assumed by new classical economics) would make this impossible. Moreover, absolutely flexible wages could result in a spontaneous costly strikes of a firm's workforce if they felt underpaid (bargaining power of workforce would be higher).
  - (b) Firms could lose valued and trained workers to competitors if they always immediately jumped to any new equilibrium level, but the competitor jumped later. Labor turnover is costly.
  - (c) If firms use scheduled staggering for wage contracts, then the average wage level is sticky and can only gradually approach the new equilibrium level after a change in prices.
2. Implicit Contract Theory: (Bailey, 1974; Gordon, 1974; Azariadis, 1975) In order to explain, why workers oftentimes accept wages below their marginal productivity, implicit contract theory understands the wage not only as a payment for labor, but also as an insurance for the worker against income volatility from wages being totally flexible and changing economic conditions. Hence workers accept a real wage cut in exchange for the risk of economy fluctuations. The theory suffers

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<sup>17</sup>Note that price rigidities and not wage rigidities are needed to explain fluctuations in output and employment, because one stylized business cycle fact is that wages move slightly procyclical.

<sup>18</sup>Finally, firms also oppose a wage that is automatically fixed to the inflation rate, since a supply shock (e.g. an increase of the oil price) would not by itself drive up prices, but drive up also wages, thereby reinforcing the price increase instead of having falling real wages offset the price increase.

under the problem that firms frequently lay off workers instead of sharing work in bad times among workers.

3. Efficiency Wage Theories: The efficiency wage theory (Solow, 1979) suggests that workers' productivity is (in some range) a function of the wage paid. As a result, a profit-maximizing firm has some optimal efficiency wage. Since this efficiency wage lies above the market clearing wage, there is involuntary unemployment. As a counterforce, high unemployment lowers the efficiency wage and brings it closer to the market clearing wage.

Three theories have been proposed to explain why firms would pay some efficiency wage above the market clearing wage:

- (a) The Adverse Selection Model: Firms, which just pay market clearing wages will not attract those workers who see their own marginal labor productivity as above the market clearing level. Hence, a firm which offers higher wages will attract the best workers. Also, firms will not lower higher wages even if faced with an excess labor supply, since then their most productive workers are most likely to quit under the new wage regime. (Weiss, 1980)
  - (b) The Labor Turnover Model: Firms which have higher labor turnover costs (from searching the market, advertising, screening, negotiating, training, severance pay and litigation costs) will try to avoid its employees to quit by offering above-market wages. (Phelps, 1968; Salop, 1979)
  - (c) The Shirking Model: Firms in which workers' performance is costly to monitor, are afraid of having workers shirk. This is a classical asymmetric principal-agent problem. With no unemployment, a worker does not incur costs if he shirks and is fired, since he can find a new job quickly. If he is however offered an above-market wage, then it becomes costly for the worker to be fired. The more expensive it is for the firm to monitor the worker or the less unemployment there is, the higher needs to be the markup of the wage so that the worker does not choose to shirk. (Shapiro, & Stiglitz, 1984)
  - (d) The Fairness Model: If workers feel 'unfairly' treated, then the moral of the workforce declines and productivity decreases. Sociological models point at factors such as the wage, status, equity, loyalty, trust, tasks relative to other workers inside and outside the company. Likewise, the reputation of a company (and thus the quality of products) may be on stake if the workforce is demoralized. (Akerlof, 1982, 1984; Akerlof and Yellen, 1987, 1988, 1990)
4. Insider-Outsider Theories: The fundamental idea is simple: while insiders are current employees, outsiders are unemployed workers. Following this theory, insiders have power to partially influence their wage. This power stems from the fact that insiders can make it outsiders hard to get productive at the work place. Insiders can for instance deny training to outsiders or harass them if they feel that their job is threatened by outsiders. Also, employed workers who feel threatened will likely be less productive by shifting effort to discussing and plotting actions with co-workers and being demoralized.

### 2.6.3 New Keynesian Business Cycle Theory

New Keynesian allow for supply and demand shocks (as well as - in contrast to Real Business Cycle Theory - for monetary shocks), whereas for them the source of shock is less important the implications on the economy. New Keynesians believe that market imperfections/failures amplify the shock's costs and can create swings in (un)employment and output, ie. business cycles.

Two branches in Keynesian Business Cycle Theory stick out:

1. Nominal rigidities create price stickiness and create fluctuations. Its rationale is as described above.
2. Flexible prices do not lead to instantaneous market clearing, but create greater disequilibria and exacerbate the up- and downswings of the business cycle! (e.g. Keynes, 1936; Tobin, 1975) The idea behind this branch is the following: Assume firms are risk-averse and capital-constrained (ie. need to borrow to finance investments). Assume the capital market is imperfect, such that lenders have (due to information asymmetry) less insight into investment profitability than borrowers. During a recession, demand shifts to the left and there is a greater risk that businesses go bankrupt; hence lenders shift a greater part of their portfolio into safer assets and interest rates go up. Under higher interest rates, the probability for defaulting on a loan increases, and a credit squeeze/credit rationing can result (Bernanke, 1983). Firms already in debt also face higher costs and a higher risk to go bankrupt and this increases the expected costs of bankruptcy. Under uncertainty, banks will decrease available credit and firms decrease their output (for given prices) and the (risk-adjusted) aggregate supply curve shifts to the left, too. While the price level thereby can stay the same (sticky prices), output and employment decreases. With a higher level of uncertainty for firms (that is, the more flexible prices are), the greater fluctuations can become. (Stiglitz & Greenwald, 1993)

#### 2.6.4 NAIRU and the Hysteresis Effect

What Friedman and the Monetarists came to call "natural rate of unemployment" is also called the non-acceleration inflation rate of unemployment (NAIRU) by Keynesians. There is really not much difference between both concepts: Friedman defines the "natural rate of unemployment" as the market-clearing rate in the perfectly competitive labor market after structural characteristics of the labor market (such as minimum wages, unemployment benefits, imperfect information, imperfect social mobility, etc.) is taken into account. NAIRU is the rate of unemployment which is when the target real wage equals the feasible (=determined by labor productivity and the firm's markup) real wage. Consequently, since NAIRU is determined by the power struggle between firm and workers as well as the production costs versus market price, the micro-foundation of NAIRU is based on imperfect labor and product markets.

The U.S. and European economies experienced exceptionally high unemployment rates for most of the 1980s, originating from high disinflation costs between 1980 and 1982 in particular in the UK under Thatcher and the U.S. under Reagan.<sup>19</sup> Two theories have been proposed to explain this prolonged recession:

1. a low flexibility of the labor market due to power unions, unemployment benefits, minimum wages, excessive regulation and high taxation
2. the NAIRU is path-dependent, that is influenced by past actual rates of unemployment levels; the shifting actual rate of unemployment pulls with some delay NAIRU in the same direction. This is called the hysteresis effect<sup>20</sup>.

There are two theories as a justification of the hysteresis effect:

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<sup>19</sup>The term hysteresis originates from physics where it describes the lagging magnetic induction behind the source of magnetism.

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1. The Duration theory argues that the longer a worker is unemployed the more of his/her human capital is lost, the more unemployable the worker becomes and long-term unemployment increases.
2. Insider-Outsider Theories argue that the higher the unemployment rate, the more power insiders exercise to keep wages up and keep outsiders from pricing their way back into employment (e.g. by increasing turnover costs, lowering productivity through harassment, etc.)

### 2.6.5 Policy Implications, Criticism and Conclusion

New Keynesians do not believe in the power of fiscal or monetary policies to fine-tune the economy. Instead, the task of the government is to remedy/alleviate market imperfections inasmuch as possible so to smooth business cycles. Mankiw - one of the most preeminent New Keynesians - argues that an equally good name for "New Keynesian Economics" could have been "New Monetarism", because contrary to RBC theorists and in synch with Friedman's Monetarism, New Keynesians believe in the real effect of money supply and oppose budget deficits. The difference to Monetarism however is that while monetarists recommend a fixed rule for money supply, New Keynesians want to upkeep flexibility in monetary policies (though not in the hand of politicians, but within an independent central bank).

New Keynesians hence recommend:

1. An independent central bank that can use monetary policies to react to macroeconomic crises.
2. Policies to reduce the duration effect (retraining of unemployed workers, subsidies to bring workers back into the workforce, encouraging job search for workers, ...)
3. Policies to reduce the power of insiders (reducing labor and union rights, reducing turnover costs, ...)
4. Policies to reduce shirking (reduction of unemployment benefits increasing social mobility, ...)
5. Policies to decrease imperfect information among workers and firms (e.g. increasing transparency on the labor market to facilitate firms' search for workers, ...)

Obviously, these policies are not so differently from those of the New Classicists. Note that income boosting policies (e.g. through fiscal policies such as decreasing income taxes) is not supported by American New Keynesians, but is so by some European New Keynesians. Income boosting policies are typically much more supported by Post Keynesians. Finally, New Keynesians are against budget deficits.

How does New Keynesian Theories fare when measuring it with the stylized facts of the business cycle? It correctly predicts the procyclical behavior of employment, consumption, investment, government expenditures and productivity. Different to RBC, the non-neutrality of money is consistent with the stylized fact that money is leading and procyclical. Sticky nominal prices can imply pro- or acyclical real wages; a New Keynesian model with an efficiency wage sensitive to the actual rate of unemployment can create mildly procyclical wages as required from the stylized facts. Finally, in regard to unemployment, the verdict depends on whether one believes in voluntary unemployment or not.

Criticism against New Keynesians includes the following points:

1. As of the late 1990s, a greater need for empirically testable macroeconomic models was required, since most Keynesians had put their focus in the 1970s and 1980s in theoretical papers on creating a micro-based foundation.

2. There are many unrelated theories, models (such as reasons for sticky prices), but not one comprehensive one.
3. Menu costs as one nominal price rigidity are criticized as being too small to create large macroeconomic fluctuations
4. Debate within New Keynesians whether the rational expectation hypothesis should be used as a basis for models, since empirical evidence is poor.
5. The IS/LM method as an economic tool is criticized on the grounds of not ignoring expectations.