

**CLASSICAL AND KEYNESIAN  
ECONOMIC EXPLANATIONS  
FOR UNEMPLOYMENT**

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## Introduction

Unemployment is a key measure of economic health. It is a major factor in determining how healthy an economy is; if the economy maximized efficiency, everyone would be employed at some wage. An individual unemployed is both unproductive and a drain on society's resources. However, while unemployment seems a basic statistic – the number without jobs divided by those with jobs – the issue is anything but. Unemployment is a powerful statistic that shapes government policy and personal decisions.

The government keeps a close eye on the unemployment rate. Not only does unemployment indicate that the economy isn't operating at peak efficiency, but politicians have noticed that high unemployment correlates with losing elections. The Federal Reserve believes that unemployment below a certain threshold they refer to as the natural rate of unemployment leads to inflation, reflecting an observation by the economist A. W. Philips correlating unemployment to inflation during the 1960s.

The Bureau of Labor Statistics is the US agency that monitors and reports on unemployment and other labor statistics. In 2006, the average unemployment rate was 4.6%<sup>1</sup>. This number only includes a subset of the total US population: the currently unemployed people who are willing and able to work. This subset of the population excludes children and infants, people in the prison system, and people who choose, for various reasons, not to work. Choosing to measure unemployment this way assumes that a classical free

<sup>1</sup> Bureau of Labor Statistics

market perspective works. That is, people making free choices will inevitably lead to the best outcome; everyone who wants a job will receive a job. In that sense, it is pointless to measure people who are unable or unwilling to work: if they wanted a job, they could get a job, and they evidently have a good reason not to work. This perspective envisions unemployment simply as the time spent between jobs; assuming people keep looking for a job, they will find one.

John Maynard Keynes criticized this viewpoint as misleading. He pointed out that the people who drove demand for goods and services are the same people participating in the labor market. Unemployment means less income, which in turn means less demand; less demand causes the demand curve in the labor market to change, creating a feedback cycle.

This paper will examine unemployment from both the classical and Keynesian perspective.

## Classical Model of Unemployment

Under the classical perspective,

...unemployment is seen as a sign that smooth labor market functioning is being obstructed in some way. The Classical approach assumes that markets behave as described by the idealized supply-and-demand model... (Goodwin 12)

This paper will present a basic model of a labor market under the classical perspective. This model will treat both labor supply and demand independently, and assumes that the market exists in

isolation. While the labor market may experience external shocks, the labor market does not depend on exterior circumstances. This paper will then use the presented model to explain how unemployment works under a classical perspective.

### Classical Labor Demand

The demand for labor in the entire economy is simply the aggregate demand for labor from each company. It follows that the behavior of the demand curve is the aggregate behavior of every company in the economy. In this light, it is easier and simpler to analyze unemployment from the standpoint of an individual company and extrapolate that behavior to the entire economy.

We can safely assume that the ultimate goal of any company is to maximize profit. It is a small leap from there to assume that as long as employing additional labor will increase profit, the company will employ additional labor; and that the inverse is true.

Profit is defined as a firm’s revenues minus its expenses. In this simplistic model, we will assume that the only expenses a company incurs are the cost of capital and the wages paid to employees.

While the firm will incur other expenses such as legal fees, marketing, pensions, and general operating overhead, the model does not need to consider these factors to explain the relationship between firm profit and labor demand.

Therefore, if we have a company such as General Motors, its profit will be a function of how many cars it can sell and at what price, minus its expenses, which are the number of workers employed at some wage and the cost of the capital.

Furthermore, we will assume that this example occurs in the short term and thus revenue per product sold, wage per worker, and cost per unit of capital are all constant.

Thus, we can express this as a function  $P(n, i, m)$  that describes profit:

$$(1) P(n, i, m) = rn - wi - km$$

Refer to the following table for an explanation of the symbols chosen:

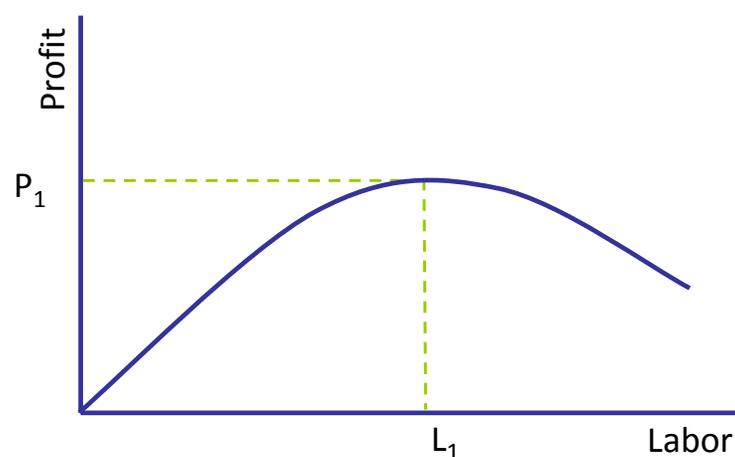
VARIABLES	CONSTANTS
$P(n, i, m)$ = function describing profit	$r$ = revenue per product sold
$n$ = amount produced = function $n(i)$ dependent on $i$ .	$w$ = wage per worker
$i$ = number of workers	$k$ = cost per unit of capital
$m$ = number of units of capital	

Profit will be maximized at an inflection point for the function  $P(n, i, m)$ . In other words, the rate of change of function  $P(n, i, m)$  with respect to  $i$  will be zero. This is the partial derivative of the function:

$$(2) \frac{dP(n, i, m)}{di} = r \frac{dn}{di} - w$$

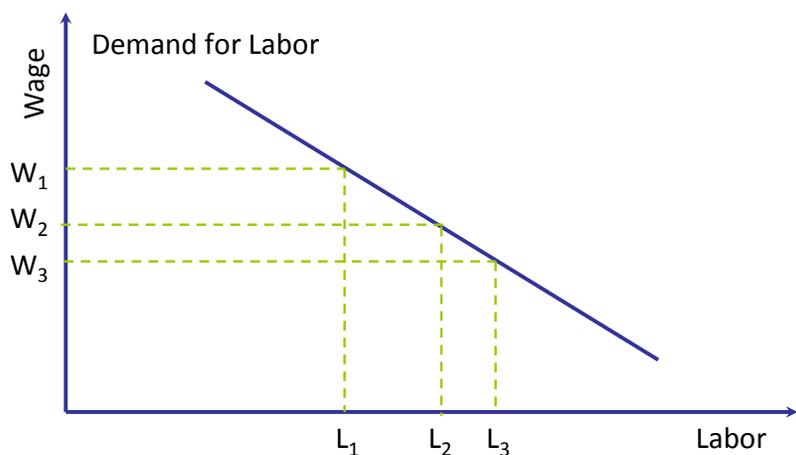
The specifics of this function will vary for each company. However, we can make some deductions. The expression  $\frac{dn}{di}$  is referred to as the marginal product of labor, because it represents the change in output for each change in the number of workers. In the short term, the marginal product of labor will decrease after a certain point. For example, General Motors cannot hire any workers beyond a certain point, regardless of how much they are paid. Each factory only has a finite number of spots on each assembly line, and attempting to pack more workers onto the line is sure to result in both missing limbs and lawsuits, but also a loss of productivity with people incessantly getting in the way.

From that perspective, the point at which  $r \frac{dn}{di} = w$  will be where profit is maximized. From then on, profit will diminish with each additional employee. The following graph illustrates the impact of the marginal product of labor on profit, with  $L_1$  the point at which  $r \frac{dn}{di} = w$ :



The function  $r \frac{dn}{di} = w$  explains how the aggregate demand curve for the economy is expressed. As wage decreases, the point at which  $r \frac{dn}{di} = w$  will move 'to the right' on the graph; the company can hire additional workers without reducing profitability. Thus, demand for labor increases within each company as wages drop, and so demand for labor increases in the overall economy as wages drop.

A stylized demand for labor graph is below:



This stylized graph assumes that  $r \frac{dn}{di} = w$  is a linear function.

However, it is entirely possible that marginal utility is not linear. For example, most manufacturing companies do not allow the public into the production area. Quite ignoring sabotage and safety, this is because people milling around in an assembly line would slow down the process. Keeping people out of the way has a value of more than zero, as the existence of security firms that protect corporate property indicate. At some point, even if a worker was not paid, an additional individual within the factory would reduce the overall productivity of the factors.

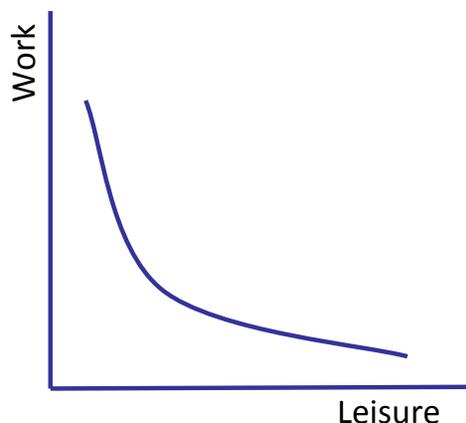
## Classical Labor Supply

People are not companies and do not maximize profit. Nonetheless, people still maximize something: they choose personal time over work time. Whether they are cleaning the house, taking their kids to

soccer practice, or watching the latest episode of 24, people do more than work, eat, and sleep. People also place some sort of value on their non-work time; otherwise, people would universally work as much as they possibly could. Instead, the amount individuals choose to work varies. The variation in how much people choose to work suggests that people are maximizing something other than money.

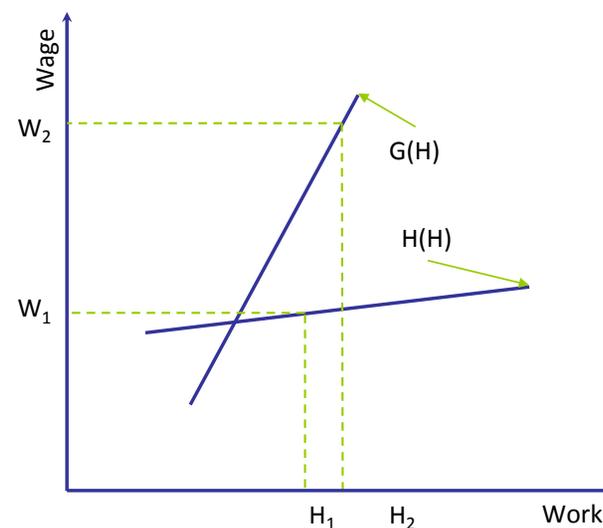
Economics typically uses the philosophical notion of *utility*, initially invented to promote an ethical paradigm. Utility is largely synonymous with *happiness*, which makes sense: people try to maximize their happiness. Dissecting utility can be complicated – for instance, determining short-term utility vs. long-term utility – and is a problem often left to psychologists and politicians, with mixed results.

The function describing utility would be different for every individual, and cannot be easily expressed mathematically. Still, we can assume the relationship between the amount of work and the amount of non-work time is a basic indifference curve: the more of something people have, the less they value more of it. As in the labor market indifference is a clear-cut choice between work and leisure, the indifference expression is simple and can be visualized in a stylized graph:



This implies that if people have a preponderance of work, they are unlikely to accept more without an increase in compensation, and that if people have a preponderance of leisure they are likely to accept a lower wage than otherwise.

The rate of change of the indifference curve would be the value of the individual to another unit of work at some point on the graph. If the wage available for the additional unit of work is high enough, then the individual will work the extra hour. This would be different for every individual. For instance, the following stylized graph contrasts the utility functions for Greg and Harry, represented respectively by  $G(H)$  and  $H(H)$ . The variable  $H$  represents the number of hours worked.

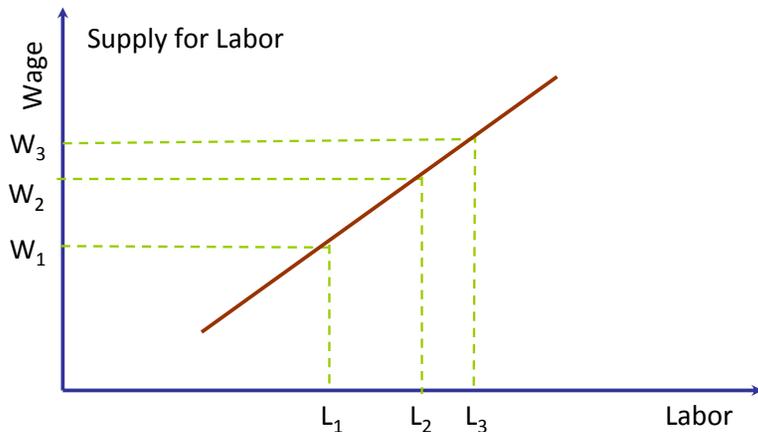


The graph illustrates how Greg and Harry value their time differently. Greg, for example, values his leisure time highly, and will only work additional hours for a substantially higher wage. However, Harry either values work more or leisure time less, and will work more hours with little complaint. The difference between Greg and Harry could be explained a number of ways. For example, if Greg recently purchased a home theatre with a 50" flat screen TV, he might prefer to spend his time watching football than working, while if Harry recently had his TV repossessed, he might prefer to work a little extra so he can match Greg's home theatre. However, in this scenario both Greg and Harry have an upward sloping demand curve which mirrors their indifference curve – they both need to be paid more to work more. This explains why companies offer overtime wages higher than regular wages: if managers want people to work overtime, people demand to be compensated at a

higher rate to compensate them for their loss of comparatively more valuable time.

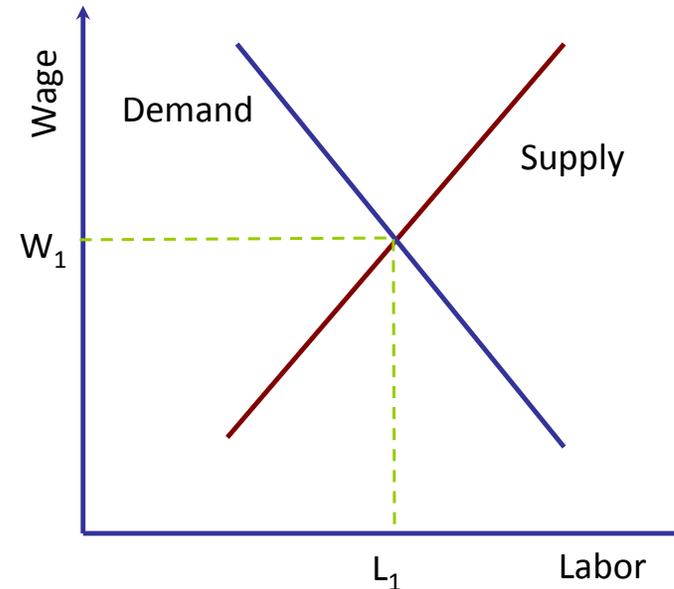
The overall supply of labor is the aggregate of all utility functions. We can extrapolate from the two stylized utility functions graphed above that under classical economics, the supply of labor curves up; the higher the wage, the more hours an individual is willing to work. This means that the supply of labor can increase without adding additional people.

The supply for labor is graphed below:



## The Classical Labor Market and Unemployment

The classical labor demand and labor supply can be combined if we combine the lines for Labor Supply and Labor demand. We can construct a stylized labor market graph:



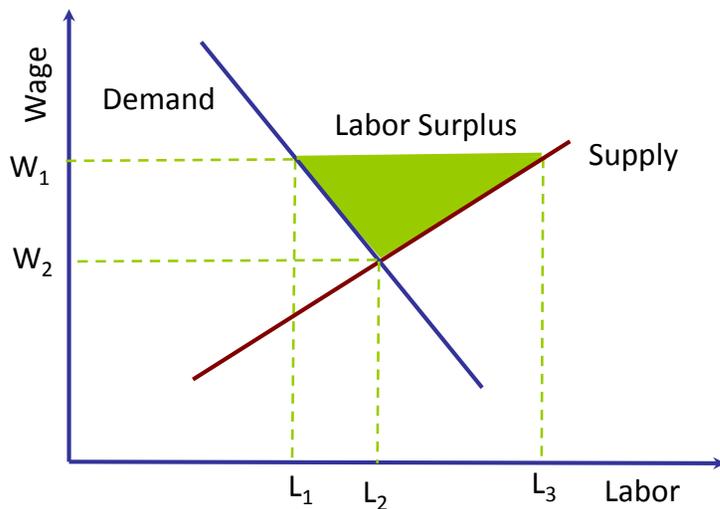
Labor Demand and Labor supply interact as a market with a simple price determinant; the market will always tend towards equilibrium at  $W_1=L_1$ . In this ideal representation of the labor market, nothing will interfere and prevent the market from achieving equilibrium. If the labor market is at any point other than equilibrium, the market will move towards equilibrium over time. This diagram thus shows that unemployment will only occur when the existing wage is greater than the market-clearing wage. The amelioration of unemployment will only occur when the market wage changes to meet the market-clearing wage at equilibrium.

## Classical Unemployment

Unemployment is, in its most basic definition, the state of not being employed. The number of individuals who are unemployed in a

labor market is the unemployment rate. Classical economics analyzes the labor market at the market level; it is also possible to subdivide the national labor market into smaller markets, such as a labor market centered on a single industry or geographical region. Each smaller labor market has certain requirements to be included, For instance, a labor market describing Saratoga Springs would only include people and business living in or within commuting range of Saratoga Springs. Another labor market could be for rocket scientists; in that case, the only people included would be people qualified to be a rocket scientist, and the only companies involved would be those who require a rocket scientist. The unemployment rate for each market differs, and averages in aggregate to the national unemployment rate.

The following stylized graph visualizes the labor market at some point when it is not at equilibrium:



Under classical economics, an ideal labor market will always reach equilibrium over time. The stylized graph shows that at  $W_1$ , the market will employ  $L_1$  people, while  $L_3$  people are willing to work. Thus, the wage in the above market will fall from  $W_1$  to  $W_2$ , and the number of people employed will change from  $L_1$  to  $L_2$ , while the number of people willing to work for that wage will fall from  $L_3$  to  $L_2$ . However, this assumes both that there are no external shocks to the labor market, and that there is no interference in the market. Thus, unemployment can exist in a non-ideal labor market; this does not change the fact that the market will continue to tend towards equilibrium.

Unemployment manifests in four different ways: frictional, voluntary, structural, and institutional.

### Frictional Unemployment

Frictional unemployment allows for the fact that a certain amount of time may pass between jobs. As many people have sadly discovered, an offer of employment is not immediately below a pink slip in one's inbox. People will register as unemployed while they are attempting to find a new job; since the labor market changes over time, there will always be a certain number of people unemployed at any one time. Even though the unemployment rate may remain constant over any period, the individuals unemployed will change over time. Frictional unemployment can be explained in terms of smaller markets described above. For example, suppose Tom is laid off from a manufacturing plant in Iowa when the plant closes. He attempts to get a new job, but plants are more interested in shutting down than hiring more workers – and there is a lot of

competition for the few positions available, since Tom is one of many individuals without work. However, Tom discovers that there are factories opening in Kentucky, where state subsidies and special tax rates are persuading companies to open factories there. Tom decides to move to Kentucky and find a job there. Tom moves from a labor market with a labor surplus located in Iowa to a labor market with a labor shortage in Kentucky, and consequently can easily find a job. The amount of time it takes Tom to find this out, sell his house, move to Kentucky, and find a new job is referred to as frictional unemployment. Frictional unemployment simply acknowledges that things take time; as elegant as a market that updates instantaneously is, real world markets do not.

## Structural Unemployment

Structural unemployment “occurs when the skills, experience, and education of workers do not match job openings” (Goodwin 27). Structural unemployment is a form of frictional unemployment, but usually lasts longer. As expressed above, if there are labor markets for each industry or position – such as rocket scientists – then there can be higher or lower unemployment in that submarket than in the national market. For example, if trade agreements allow companies to outsource work to a different country at a lower cost than employing rocket scientists, then the labor market for rocket scientists will diminish within the country. Rocket scientists may then find that they lack the training or requirements for other labor markets. Consider the plight of Ted, a rocket scientist, who becomes unemployed because his work is outsourced to China, and finds that he is not eligible for many jobs (either because he is overqualified or lacks the necessary experience). Ted may find that he needs to

retrain to gain access to other labor markets he is interested in – such as acting. The time it takes for Ted to retrain is a type of frictional unemployment, and is referred to as structural unemployment.

## Voluntary Unemployment

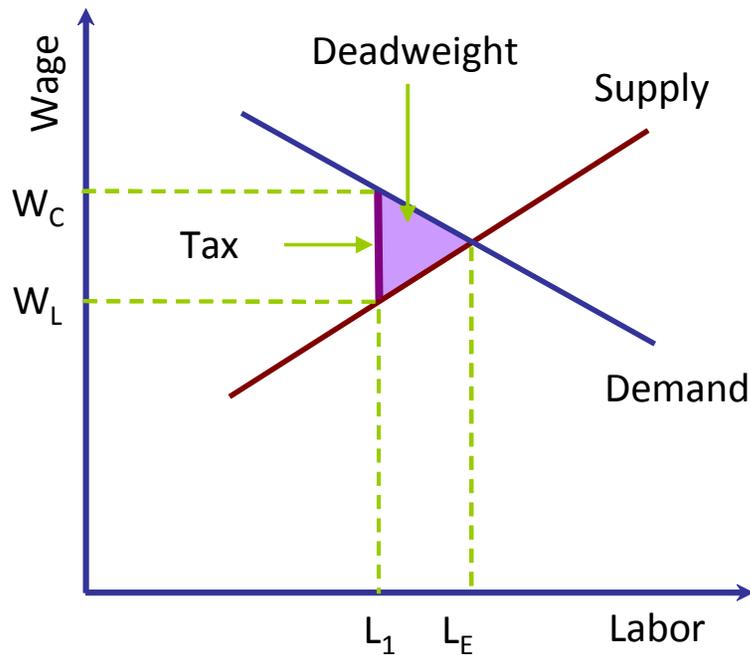
Voluntary unemployment is functionally another type of frictional unemployment, and occurs when people choose not to accept a market-clearing wage. People have a certain amount of pride, and over time become accustomed to a certain quality of life that is funded by their salary. An unemployed individual may turn down a job at a market-clearing wage because he believes the pay less than he deserves. Similarly, a company may offer a number of unemployed people jobs, only to be consistently turned down because the wage the company offers is below the market-clearing wage. In both cases, after a certain amount of time each party will get desperate and modify their strategy. The individual will accept a lower wage, and the company will increase their compensation. Of course, the time it takes someone to accept a lower wage – in effect, how stubborn an individual is – depends on how badly they need a job. This will vary from person to person, depending on their financial reserves, and will also be affected by any government social welfare programs that give them a wage even while unemployed.

## Institutional Unemployment

Institutional unemployment explains how interference in the labor market can create unemployment. The government is the most common instigator of institutional unemployment. Governments

can set taxes, create price floors or price ceilings, and indirectly support other factors of institutional unemployment such as labor unions.

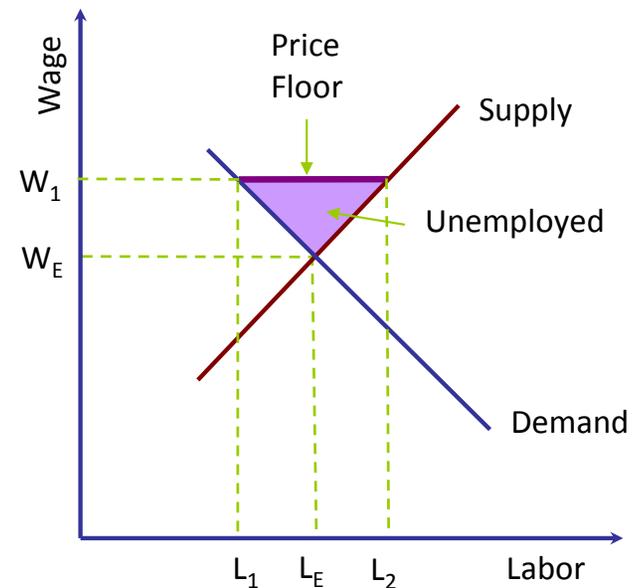
Like any other market, the imposition of a tax will create market deadweight, causing the market to reach equilibrium at less than full employment. The following stylized graph illustrates how a tax on wages – such as an income tax – creates a market deadweight:



If a tax is imposed on a labor market, then there is a difference between the wage a company pays and a wage employees earn. Under a tax,  $W_C$  is what companies pay while  $W_L$  is what employees receive –the amount that companies pay minus the size of the tax. The number of people employed subsequently falls from  $L_E$  to  $L_1$ .

Imposing a tax increases voluntary unemployment – people or companies unwilling to accept employment at the market wage. Consider the example of Delta Communications, who wanted to hire another IT specialist to increase operating uptime. However, a government tax of 30% on the wage for an IT specialist increases the cost of an IT specialist above the point where the company would break even if it hired one. Thus, the company voluntarily chooses not to employ an IT specialist.

The government could also decide that everyone needs to earn a minimum amount of money – less than that is simply unfair to its citizens. A government-imposed minimum wage establishes a price floor that prevents supply and demand coming to equilibrium. The following stylized graph illustrates the effect a price floor has on the labor market:



The above stylized graph shows that a price floor instituted at wage  $W_1$  will force the wage to increase from the market-clearing wage of  $W_E$  to  $W_1$ . The labor demand will decrease from  $L_E$  to  $L_1$ , while the labor supply will increase from  $L_E$  to  $L_2$ . This will create unemployment, as indicated on the graph.

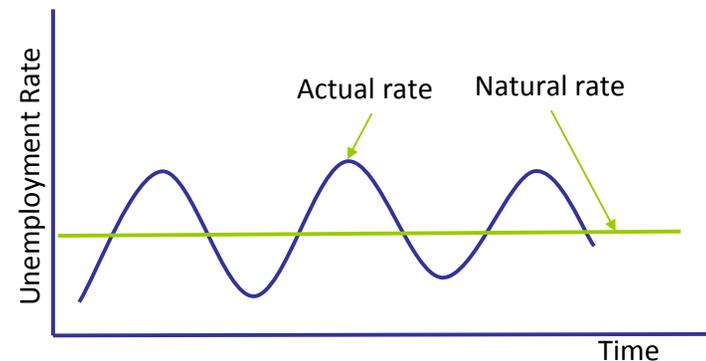
However, not all institutional unemployment comes from the government. Labor unions can create an effective price floor for a single company or industry, such as the United Auto Workers creating a price floor for compensation in the car industry.

The government can also indirectly sponsor unemployment through social welfare programs. Unemployment compensation reduces the incentive for an individual to get a new job rapidly, thus increasing frictional unemployment. A recent bill supported by the Democrats in Congress proposes creating “wage insurance” for the unemployed: if an unemployed individual is unable to find a job at the same wage as his previous place of employment, he can accept a lower paying job and the government will make up the difference (up to some limit).

### Natural Rate of Unemployment

Unemployment under the classical perspective treats the labor market like a single market that can be studied under basic microeconomic theory. Unemployment will always exist, because the labor market is not perfect, but the labor market will always tend towards some equilibrium and, over time, unemployment should always decrease to some point.

However, the fact that the labor market is not an ideal market leads to a classical explanation for a natural rate of unemployment. The natural rate of unemployment is the rate of unemployment that would prevail in the absence of business cycles. The economy has cyclical cycles of boom and bust, and so the labor market will be continually shocked by the overall economic cycle. Thus, the labor market will continually move towards equilibrium, but never reach it – the ‘natural’ rate of unemployment – and so be in a constant state of change. The following highly-stylized graph illustrates the concept:



The actual rate of unemployment would only reach the natural rate of unemployment in an environment with no economic boom/bust cycle.

### Keynesian Model of Unemployment

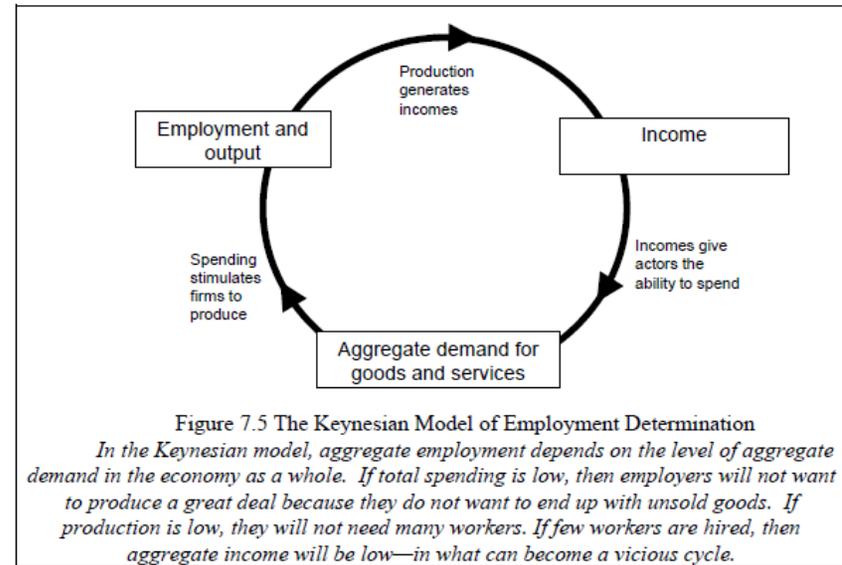
Keynes criticized the classical economic understanding of the labor market as misleading. He claimed that classical economic theory may be good for analyzing single, isolated markets, but the labor market was not isolated. The labor market is in fact unique among

all markets because of the relationship between unemployment and demand. Keynes pointed out that a nation consumes a majority of what it produces. It follows that the economy needs to have a level of demand equal to the level of production within the economy.

Keynes also pointed out that, ultimately, individuals purchase a majority of products within society. Thus, the more money people had the greater demand for goods and services. The greater demand for goods and services, the more that needs to be produced, and the more labor hired to increase production. The labor market is a proxy for the overall economic health of the economy; and unemployment is bad because it decreases aggregate demand in the economy.

Aggregate demand is linked to demand for labor, since the greater the demand the greater the production – and companies need to hire more people to produce more. Or, if aggregate demand falls, companies will lay off people because their work is not needed.

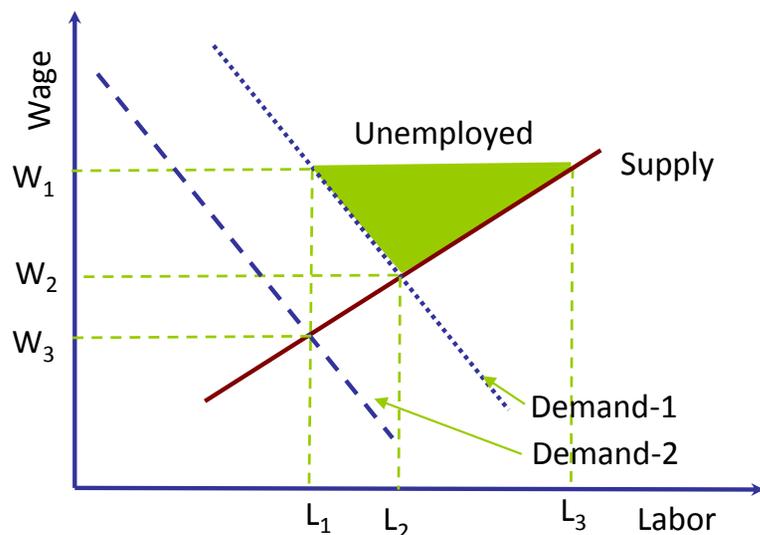
The following diagram, from *Macroeconomics in Context*, illustrates the relationship between employment, income, and aggregate demand. The three variables are all proxies for each other; a change in one necessitates a change in all. Either an increase or a reduction in any variable, for whatever reason, will move the entire economy in that same direction.



The diagram illustrates how income directly affects aggregate demand that in turn affects the level of employment. If there is resistance to change at any point in the diagram – practically, either employment level or income level – then the system may arrive at equilibrium below full employment.

The following graph illustrates what could happen in Keynesian theory. If the market is at equilibrium, and there is an external shock to the economy that results in a high level of unemployment, then demand in the economy would fall as the unemployed reduce their consumption of goods and services. As demand in the economy falls, production will fall to meet demand. Employers don't need as many people to produce less work, so their demand curve moves to the left. Thus, if the initial position of the market is at  $W_2=L_2$  using Demand-1, and a shock to the market results in the

market moving to point  $W_1=L_1$  on Demand-1, then over time the demand curve to move to Demand-2 as the demand for labor falls. In that case, equilibrium would occur at  $W_3=L_1$ .



The graph shows a scenario where the labor market could be at equilibrium at a point that would leave the same number of people unemployed as during the market shock, and at a lower wage because of increased competition in the labor market. While the market is at equilibrium and operating normally under a classical viewpoint, Keynes believed that this was a waste. In the long run the market may correct itself, but in the long run you're dead.

The criticism John Maynard Keynes levied against the classical model was that it treated the labor market as isolated within the entire economy. However, Keynes' view linked the labor market with the overall economy, establishing a feedback cycle. Unemployment would then be the result of changes in the overall

market, which could be an aspect of unemployment in the first place.

## Conclusion

Employment, as seen by those who espouse classical view of an economy, is simply an expression of the overall labor market where the market wage equates the freely determined demand for and supply of labor. The labor market is a series of aggregates of supply and demand, originating with the individual and the company. The behavior of the market can be extrapolated from the behavior of the individuals within the market; there are few dependencies.

The classical explanation of unemployment differs only in one detail from later Keynesian theories. The cyclical nature of the economy and the level of employment drive aggregate demand, which in turn drives the level of unemployment. Keynes believed that while classical economics provided a solid theory to analyze unemployment on a microeconomic level in submarkets, it ignores the cyclical nature of the economy on a macroeconomic level.

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