FACULTY OF ECONOMICS

Macroeconomics I. – Supplementary Materials

Labour Market and Related Concepts

Ing. Milan Bednář, Ph.D.

Department of Economic and Social Policy

Content

Basic Concepts

Part I

Labour Market and Labour Input

- **Labour market occurings (e.g. employment rate) and labour input are one of the most important determinants of economic growth both in short and long term**
  - Short term: labour is often considered as variable input (as opposed to capital input)

- **Labour input – people and their work**
  - Both quantitative and qualitative factor affecting the development of an economy
  - **Many aspects:** economic, social, and international

Labour Market and Labour Input

- **The population of a particular territorial unit can be divided into sub-groups on the basis of different criteria**
- **Population is a stock indicator**
  1. **The data are related to a specific date**
     - Usually the last day of a month, quarter or year
  2. **The data are reported as averages over a certain time period**

Unemployment and Economic Theory

- Economic theory looks at unemployment in terms of its causes
- **The actual unemployment rate in the economy is composed of sub-types of unemployment (some are typical for only one/selected economic schools):**

1. **Frictional unemployment**
2. **Structural unemployment**
3. **Cyclical unemployment**
4. **Seasonal unemployment**
5. **Technological unemployment**

Unemployment and Economic Theory

1. Frictional unemployment

— Monetarists, short-term nature

— There are constant changes in the labour market as individual businesses are formed and disappear, under an imperfect/asymmetric information of entities (i.e. positive search costs), and therefore, unemployed persons do not immediately enter a new employment relationship, they may (speculatively) wait for example

2. Structural unemployment

— It is sometimes understood as a case of long-term frictional unemployment

— It is arising when the supply of labour does not match the demand (e.g. qualifications of workers) due to structural changes in the economy

Unemployment and Economic Theory

2. Structural unemployment (continued)

- For instance: emergence and disappearance of sectors (changes in focus and number of firms in sectors), or a case of geographical imbalances (structurally affected regions)
- There may be vacancies (unoccupied positions) equal to the number of the unemployed

3. Cyclical unemployment

- Emphasised by Keynesian economists, who consider the cyclical fluctuation of actual real product around potential product to be the main cause of this unemployment (both supply and demand factors)
- Labour market rigidities are also important in this sense – they determine it
  - E.g. Barriers/regulations – the role of trade unions, minimum wages, etc.)

Unemployment and Economic Theory

4. Seasonal unemployment

- A part of the natural unemployment rate of monetarists and the new classical macroeconomics (neoclassical theory)
- It is sometimes classified as part of the frictional unemployment rate
- It reflects the seasonal patterns of labour demand for certain professions

5. Technological unemployment

- Linked to the existence of technological changes leading to a change in labour demand
- It is sometimes viewed as part of structural unemployment

Unemployment and Economic Theory

- **Another view: voluntary and involuntary unemployment**
  - **Voluntary unemployment** (the voluntary nature of unemployment) is linked to the existence of a natural rate of unemployment – those who are interested can find a suitable job
    - Persons who do not work do so voluntarily, because the level of real wage rates is not sufficient given the price of the loss of free time if they start working and therefore opt for free time
  - **Involuntary (sometimes called Keynesian) unemployment** is associated with the existence of high real wage rates (e.g. due to the existence of rigidities that prevent a decline in the event of depression) that do not allow jobseekers to find employment because companies are unwilling to pay such high wages (and balance the market)
- **Other views:** hidden unemployment, full employment, …

Unemployment and Economic Theory

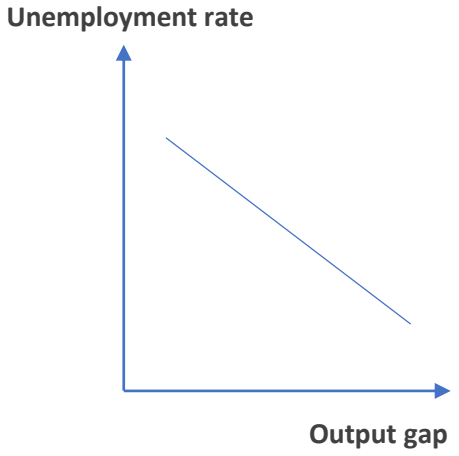
- **Natural unemployment rate**
  - This rate consists of a frictional and seasonal unemployment rate, i.e. linked to a situation where the markets in the economy have a long-term equilibrium in optimal use of resources
  - Determinants of natural unemployment rate are demographic factors,
    socio-psychological factors, structural changes, regulatory interventions, etc.
- **Alternative view: Phillips curve and the existence of expectations**
  - **Linking unemployment to inflation (indirect relationship)**
  - This situation is linked to the existence of a stable inflation rate (the inflation rate expectations correspond to the actual inflation rate) – the level of unemployment rate does not affect it

Okun's Law – Unemployment and GDP

- **Relationship between unemployment and economic performance**
- American neokeynesian economist A. Okun first presented it in his article at the meeting of the American Statistical Society in 1962
- Formally, we can write his idea of mutual dependence of both variables in the form of (gap) relation:

$$\left(y_t - y_t^p\right) = \lambda\left(u_t^p - u_t\right)$$

- $\left(y_t - y_t^p\right)$ is output/GDP gap
- $\left(u_t^p - u_t\right)$ is unemployment gap
- λ is the sensitivity coefficient of the product gap to the unemployment gap



Broad Division

1. **Economically active persons = (potential) labour force available**
   - **It consists of persons employed and unemployed at a certain age interval**
   - Lower limit is usually 15 years (ILO definition)
   - **EU: differences across the national statistical authorities**
     - **Lower limit: 15 or 16 years** (depending on compulsory education requirements)
     - **Upper limit: 74 years** (Eurostat has applied this rule for EU countries since harmonization with the ILO methodology in 2001)

2. **Economically inactive persons**
   - **Two groups – under 15 years and over 15 years**

Underemployment

- **The problem with regard to statistical monitoring is the issue of underemployment**
  - **I.e. when the employed or self-employed persons are in inadequate position in terms of time or professional standards**
  - A more detailed analysis distinguishes between visible and hidden underemployment

a) Visible underemployment

- **Usually monitored by national statistical offices**
- **ILO definition – these are people who:**
  1. Have been forced to work for less than the normal duration of the activity (8*5=40 hours per calendar week) or part-time
  2. Wish and are able to carry on their activity for a longer number of hours
  3. At the same time are looking for work or being prepared for further work (but if they did not work in the the last 4 weeks, they are considered unemployed)

Underemployment

b) Hidden underemployment

— Cannot be monitored by definition

— The basic characteristics include low productivity, low income and underutilisation of skills

Basic Analysis of Labour Market

Part II

Factors Affecting Labour Demand and Supply

- **Balancing is a messy process (information assymetries, labour market rigidities, …)**
- **The demand curve for labour shows the quantity of labour employers wish to hire at any given salary or wage rate, under the ceteris paribus assumption**
  - A change in the wage or salary will result in a change in the quantity demanded of labour
  - If the wage rate increases, employers will want to hire fewer employees
    - The quantity of labour demanded will decrease, and there will be a movement upward along the demand curve

Factors Affecting Labour Demand and Supply

- **The supply of labour** is upward-sloping and adheres to the law of supply (employees)
  - The higher the price, the greater the quantity supplied and the lower the price, the less quantity supplied
  - The supply curve models the trade-off between supplying labour into the market or using time in leisure activities at every given price level
  - The higher the wage, the more people are willing to work and forego leisure activities

Basic Factors Affecting Labour Demand

Factors	Results
Demand for Output	When the demand for the good produced (output) increases, both the output price and profitability increase. As a result, producers demand more labor to ramp up production.
Education and Training	A well-trained and educated workforce causes an increase in the demand for that labor by employers. Increased levels of productivity within the workforce will cause the demand for labor to shift to the right. If the workforce is not well-trained or educated, employers will not hire from within that labor pool, since they will need to spend a significant amount of time and money training that workforce. Demand for such will shift to the left.
Technology	Technology changes can act as either substitutes for or complements to labor. When technology acts as a substitute, it replaces the need for the number of workers an employer needs to hire. For example, word processing decreased the number of typists needed in the workplace. This shifted the demand curve for typists left. An increase in the availability of certain technologies may increase the demand for labor. Technology that acts as a complement to labor will increase the demand for certain types of labor, resulting in a rightward shift of the demand curve. For example, the increased use of word processing and other software has increased the demand for information technology professionals who can resolve software and hardware issues related to a firm's network. More and better technology will increase demand for skilled workers who know how to use technology to enhance workplace productivity. Those workers who do not adapt to changes in technology will experience a decrease in demand.

Source: Bccampus (2020) – https://opentextbc.ca/principlesofeconomics/chapter/4-1-demand-and-supply-at-work-in-labor-markets/

Basic Factors Affecting Labour Demand

Factors	Results
Number of Companies	An increase in the number of companies producing a given product will increase the demand for labor resulting in a shift to the right. A decrease in the number of companies producing a given product will decrease the demand for labor resulting in a shift to the left.
Government Regulations	Complying with government regulations can increase or decrease the demand for labor at any given wage. In the healthcare industry, government rules may require that nurses be hired to carry out certain medical procedures. This will increase the demand for nurses. Less-trained healthcare workers would be prohibited from carrying out these procedures, and the demand for these workers will shift to the left.
Price and Availability of Other Inputs	Labor is not the only input into the production process. For example, a salesperson at a call center needs a telephone and a computer terminal to enter data and record sales. The demand for salespersons at the call center will increase if the number of telephones and computer terminals available increases. This will cause a rightward shift of the demand curve. As the amount of inputs increases, the demand for labor will increase. If the terminal or the telephones malfunction, then the demand for that labor force will decrease. As the quantity of other inputs decreases, the demand for labor will decrease. Similarly, if prices of other inputs fall, production will become more profitable and suppliers will demand more labor to increase production. The opposite is also true. Higher input prices lower demand for labor

Source: Bccampus (2020) – https://opentextbc.ca/principlesofeconomics/chapter/4-1-demand-and-supply-at-work-in-labor-markets/

Basic Factors Affecting Labour Supply

Factors	Results
Number of Workers	An increased number of workers will cause the supply curve to shift to the right. An increased number of workers can be due to several factors, such as immigration, increasing population, an aging population, and changing demographics. Policies that encourage immigration will increase the supply of labor, and vice versa. Population grows when birth rates exceed death rates; this eventually increases supply of labor when the former reach working age. An aging and therefore retiring population will decrease the supply of labor. Another example of changing demographics is more women working outside of the home, which increases the supply of labor.
Required Education	The more required education, the lower the supply. There is a lower supply of PhD mathematicians than of high school mathematics teachers; there is a lower supply of cardiologists than of primary care physicians; and there is a lower supply of physicians than of nurses.
Government Policies	Government policies can also affect the supply of labor for jobs. On the one hand, the government may support rules that set high qualifications for certain jobs: academic training, certificates or licenses, or experience. When these qualifications are made tougher, the number of qualified workers will decrease at any given wage. On the other hand, the government may also subsidize training or even reduce the required level of qualifications. For example, government might offer subsidies for nursing schools or nursing students. Such provisions would shift the supply curve of nurses to the right. In addition, government policies that change the relative desirability of working versus not working also affect the labor supply. These include unemployment benefits, maternity leave, child care benefits and welfare policy. For example, child care benefits may increase the labor supply of working mothers. Long term unemployment benefits may discourage job searching for unemployed workers. All these policies must therefore be carefully designed to minimize any negative labor supply effects.

Source: Bccampus (2020) – https://opentextbc.ca/principlesofeconomics/chapter/4-1-demand-and-supply-at-work-in-labor-markets/

Note: Minimum Wage

- **Rather a political tool**
- Economically limited impact (small pool of people)
- **Economically harmful (except rare cases)**
  - It increases rigidity of labour markets and does not allow low-skilled workers to compete using price/their wage level
  - If affects whole labour market (discrimination is both empirically and politically problematic), there is an information assymetry, lobby groups etc.
- **Econometric studies:**
  - Majority of studies is poorly made
    - Aggregated macroeconomic data + small effect
  - Studies which have used microeconomic data (e.g. using matching techniques) are arguably more precise

Labour Costs

- **Labour market situation must also be assessed by analysing labour cost development**
- **Three cost components:**
  - Wage development
  - Social security contributions
  - Taxes paid on wages (i.e. income taxes)
- **-> Two structural perspectives: employer vs. employee**
  - **Employee:** it is a source of income that serves to satisfy individual needs of an individual (household) and is thus an incentive to enter the labour market
  - **Employer:** it is a cost that affects the profitability of production and the competitiveness of production in an individual company (in relation to labour productivity) and determines the production methods and thus the amount of work required

Basic Analysis

- **For the first approximation of the labour market situation, various ratios are used**
- **However, a more in-depth analysis and identification of ongoing trends requires a more detailed approach**
  - Different population classifications can be used based on socio-demographic and geographical characteristics (nationality, country of origin, …) and other characteristics (gender, age, education, employment status, profession, work time, disability/health status, regional structure etc.)
- The basic indicators used to analyse population development and the labour market situation include the **employment rate, the unemployment rate** (general, registered, long-term), and the **rate of economic participation** (economic activity)

Basic Labour Market Indicators

Part III

Economic Activity Indicators

- **Economic activity rate (or labour force participation rate) f_t:**
  - Measures the number of economically active inhabitants A_t in relation to the total population of a given country (or a state, region, integration unit) F_t in a given time t (e.g. at the end of a calendar month, quarter)
  - **It is the percentage of the population, both employed and unemployed, that constitutes the manpower supply of the labour market, regardless of their current labour status**
    - **It refers to the number of people who are either employed or are actively looking for work**
  - **This figure is a measure of the degree of success of the economy in engaging the population in some form of production**

Economic Activity Indicators

- **Economic activity rate (or labour force participation rate) f_t:**
  - **These are stock indicators**

$$f_t = \frac{A_t}{F_t}$$

- **Sometimes, international comparisons use only the population over 15 years of age:**

$$f_t^{15+} = \frac{A_t}{F_t^{15+}}$$

Economic Activity Indicators

- **As there are significant differences in the economic activity of the population by age and sex, indicators for men and women and for different age groups are also calculated**
  - Usually 15-24 and 15-64 years
  - Eurostat also uses 20-64, 25-54 and 55-64
  - Or, given the availability of data, indicators can be constructed for persons of any age, even at one-year intervals):

$$f_t^N = \frac{A_t^w}{F_t^N}$$

Where:

- N denotes either the entire population or the population of persons over 15 years of age
- A_t^w is the number of active persons in the relevant age group (e.g. 30-39, 40-49, …)
- F_t^N is the total population or population over 15 years at a given point in time

Employment and Unemployment Rates

- **The employment rate e_t:**
  - **Is the ratio of the number of employed persons (E_t) to the total population of a given age group at time t (usually we use total population, alternatively 15-64, 15+)**
  - **N denotes the entire population of persons over 15 years of age (15+), 15-64 usually**
  - Again, it can also be calculated for sub-age groups
  - Moreover, F_t^N includes people that have stopped looking for work

$$e_t = \frac{E_t}{F_t^N}$$

Employment and Unemployment Rates

— **The registered unemployment rate u_t^r:**

— Is the ratio of registered job applicants (U_t^r) and disposable labour force
(the sum of unemployed persons registered by labour offices and employed persons from LFS):

$$u_t^r = \frac{U_t^r}{E_t + U_t^r}$$

Other Indicators

— **Underemployment** is calculated as the number of underemployed U_t^{UE}, usually related to the total number of part-time workers E_t^{PT}:

$$e_t^{UE} = \frac{U_t^{UE}}{E_t^{PT}}$$

— **Specific indicators of employment and unemployment are also published and analysed, which are monitored by statistical and state authorities according to a number of economic and non-economic aspects:**

- Age, gender, education
- Territorial/geographical aspect (NUTS)
- Economic Activity

— **In the case of unemployment, the length of unemployment, and the frequency of unemployment are also monitored**

Labour Cost Index (LCI)

- It is calculated by Eurostat (quarterly)
- **The labour cost index (LCI) shows the short-term development of the labour cost, the total cost on an hourly basis of employing labour**
  - In other words, the LCI measures the cost pressure arising from the labour production factor
- It covers the evolution of the change in **hourly labour costs** and allows to obtain information on the evolution of labour costs adjusted for the number of paid hours (part-time, overtime)
- The index can be divided into two parts comprising labour costs and non-labour costs (employers' social insurance payments, taxes paid without subsidies)

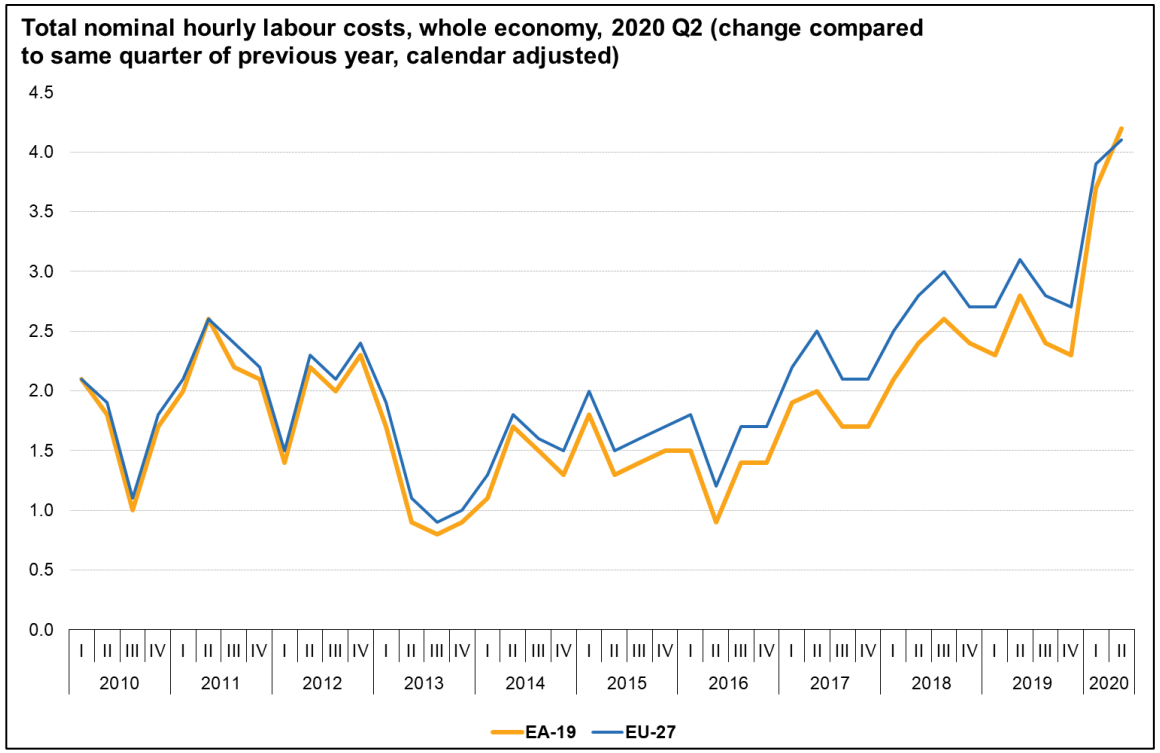
Labour Cost Index (LCI)

- Comparison of hourly labour costs can serve as first information for investors considering investing (e.g. FDI) in a given economy
- These indicators are often used because they indicate, for example, the actual number of euros that an investor in a given country has to spend on labour, and this value can easily be compared to the relevant national level
- **However, these indicators show both differences in wage levels and reflect differences in price and economic levels**
  - **Comparisons should also be made with 'undistorted' labour costs expressed in purchasing power parities**

Labour Cost Index (LCI)

The index expresses **nominal values** – a caution needs to be present

-> The Eurostat focuses on short-run changes



Data source: *Eurostat (2020), https://ec.europa.eu/eurostat/statistics-explained/index.php/Labour_cost_index_-_recent_trends#Overview*

Negotiated Wages

- Available only for the Euro Area countries
- **It shows agreed wages regardless of the actually paid wages and employer's social security contributions**
  - It excludes bonuses, overtime and other individual compensation that is not linked to collective bargaining
- Any difference between the actual wage outcome and the previously agreed or negotiated wage is generally referred to as the "**wage drift**"
- Wage drift may occur as a result of more overtime hours (because of greater demand for company's output) or as a result of bonuses (short-term movements)

Unit Labour Costs (ULC)

- **It is important for the competitiveness of a company (or economy) that productivity growth is in line with labour cost growth**
- Significant differences between the growth rate of labour costs compared to labour productivity has a possible direct impact on profitability/competitiveness and future development *(unless this is compensated for by simultaneously reducing other costs)*
  - It also affect the overal macroeconomic stability; **the changes should be slow**
- **Unit labour costs are considered to be one of the most important (complementary) economic indicators**
  - It links together productivity and wage development

Unit Labour Costs (ULC)

- **Unit labour cost is calculated as the ratio of labour costs to labour productivity**
  - **On the one hand, the ratio shows the amount of labour costs needed to produce one unit of GDP**
  - **On the other hand, unit labour cost indicates the ratio of labour costs to productivity in the production of GDP**
  - **In broad terms, unit labour costs show how much output an economy receives relative to wages, or labour cost per unit of output (per person/hour)**

Other Concepts

Part IV

Average x Median Wage

- **Average wage x Median wage**
  - The role of extreme values; average is an imaginary number
    - Upward distortion: small group of employees with very high salaries
- **The average wage is not an indicator that should tell you what majority of employees earn**
- **The average wage is supposed to reflect the total wage level**
  - It is used mainly in time comparisons (development compared to the previous period)
  - Or in international comparisons, converted to the same currency, either using exchange rates or purchasing power parities
- Complaining that my wage is below the national average is therefore absurd
  - Look for more detailed statistics on wage levels in individual groups

Wage Discrimination

- Some people say that women are discriminated against because they are paid less than men and then use the average wage comparison of men and women according to wage surveys as an argument
  - **However, this is not a very relevant argument**
- Discrimination is when a woman receives a lower wage than a man for the same job in the same place - but the arithmetic mean tells us nothing about that
- **Women generally work in other jobs than men, have different qualifications, differ in education, and also have lower average hours worked - in particular lower overtime hours, which are paid at a higher rate**
  - And all this naturally affects the wages they get for their work

Wage Discrimination

- **Furthermore, middle-age wage slump in the case of women is caused by career breaks in most of them as a result of maternity and parental leave**
- **In addition, as already mentioned, the average wage is not an indicator that describes the wage of an average employee, especially because the average is inflated with sporadic very high salaries**
  - These are the salaries of large business managers in particular, and it should be noted here that they are mostly men
  - The wage average for men is therefore more exaggerated than the wage of an 'ordinary' employee than it is for women

EVROPSKÁ UNIE
Evropské strukturální a investiční fondy
Operační program Výzkum, vývoj a vzdělávání
MINISTERSTVO ŠKOLSTVÍ, MLÁDEŽE A TĚLOVÝCHOVY

Národohospodářská fakulta VŠE v Praze