Factors of Production

Chapter 9

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Learning Outcomes

In this chapter we will:

- distinguish between a goods and services market and a factor market
- outline the factors of production
- examine the factors affecting the demand for labour
- construct a graphical representation of the relationship between the wage rate and quantity demanded of labour; analyse the reason for the shape of the demand curve for labour
- explain marginal physical productivity and marginal revenue productivity of labour; critically analyse the usefulness to an employer and employee of a knowledge of MPP and MRP
- examine the factors affecting the supply of labour
- construct a graphical representation of the relationship between the wage rate and quantity supplied of labour; analyse the reason for the shape of the supply curve for labour
- construct a graphical representation of labour market equilibrium and show the effect of government interventions such as minimum wage or taxation on equilibrium
- discuss the factors that determine wage differentials in the labour market

Factors of Production

Land

Labour

Capital

Enterprise

Factors of Production Overview

Factor	Definition	Return	Example
Land	All natural resources used in production	Rent	Farmland, rivers, minerals
Labour	Human effort (physical and mental) used in production	Wages	Teacher, factory worker
Capital	Man-made goods used to produce other goods	Interest	Machinery, tools, buildings
Enterprise	The organisation of other factors and risk-taking to produce goods/services	Profit	Business owner, entrepreneur

Introduction: Factor Markets

A factor market is distinct from goods & services market, in the sense that factor markets arise out of *derived demand*.

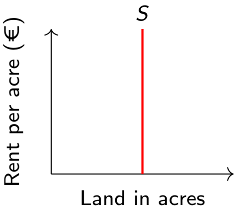
Derived Demand – Definition

Derived demand occurs when a commodity is demanded, not in its own right, but rather for its production to the production process.

Consider crude oil – no consumer wants raw crude oil yet it is a vital part of many products: plastics, clothing, fuel. It also has a central role in the transport and delivery of goods and services. Crude oil isn't demanded *in its own right*, but instead for its use as a raw material.

Land: Economic Characteristics

Fixed in supply: the available stock of land (supply) will not change, regardless of price. By its very definition, land is a naturally occurring resource, so its availability cannot be changed by man.



Has limited mobility: land has no geographical mobility, which means it is impossible to move a piece of land from one location to another. However, land has mobility of use like residential, commercial, recreational. We can represent this graphically using a vertical supply curve

Supply of land is price elastic: this means that no matter what price is offered, the supply of land on the market will not change.In other words, land is insensitive to changes in its own price.

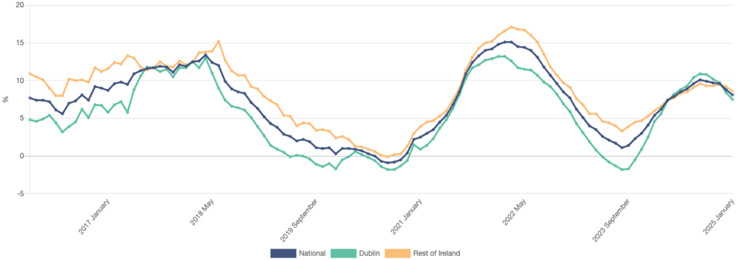
Non-Specific Purpose: land, as a factor of production, doesn't have a specific use/purpose, rather it can serve a variety of purposes. E.g., the field at the back of my house used to be a football pitch/garden (recreational purpose) but now its used for cattle grazing (agricultural purpose).

Factors Affecting Property Prices

Zoning and Land Use: Commercial land yields higher returns, so rezoning can boost land value.
Infrastructure & Investment: New transport links (e.g. Luas), shopping centres or schools nearby make land more desirable.
State of the Property Market: Booms increase rent through demand; recessions lower rent due to reduced activity.
Taxation & Incentives: Tax breaks/grants can raise demand and rent; high taxes reduce attractiveness.
Supply, Demand & Credit: Limited land with high demand raises rent. Easy access to credit increases buying power.

Factors Affecting Property Prices

This is a good opportunity to practice some exam-style responses. The following graph, taken from CSO, shows the % change in Irish property prices over Feb 2016 – Jan 2025.



Since the new syllabus was introduced in 2020, there has been a focus on blending analytical and technical skills. We could design a question like

With reference to the graph above, explain the changes in Irish property prices 2016-2025.

This question reflects the focus of the new syllabus:

1. We need to use analytical skills to describe the trend shown in the graph.
2. Having identified the trend patterns, we call on knowledge from our study of economics to explain what is causing these patterns.

Developing an Exam-Style Response

With reference to the graph, explain the changes in Irish property prices 2016-2025.

Analytical Description of Trends (CSO Data):

- 2016–2018: Property price inflation increased steadily, peaking around **15%** (Rest of Ireland) in mid-2018. Dublin peaked slightly lower at approx. **11%**.
- 2018–2020: Noticeable decline in price growth. National figures fell below **1%** in late 2020; Dublin dipped briefly **below 0%**.
- 2021–2022: Rapid recovery post-COVID. National prices surged back to approx. **15%** by mid-2022.
- 2022–2023: Sharp deceleration, especially in Dublin (briefly negative), before stabilising again near **5%** by 2025.

Explanation of the Patterns:

2016–2018 Boom: Driven by economic growth, strong employment and constrained property supply. 2018–2020 Slowdown: Impact of ECB lending rules & affordability concerns. 2021 Surge: COVID-related pent-up demand, record-low interest rates, and increased savings boosted demand. 2022–2023 Drop: ECB rate hikes, inflation, and higher mortgage repayments reduced affordability and demand. 2024–2025 Stabilisation: As inflation eased and credit markets adjusted, growth returned to more sustainable levels.

Labour: MPP & MRP

Definition

Marginal Revenue Productivity is the extra revenue earned as a result of employing one additional unit of a factor of production.
Marginal Physical Product is the extra physical output produced as a result of employing one additional unit of a factor of production.

These definitions are generic to each factor. Lets apply this to a labour context.
Miguel is an avocado farmer. He harvests 1,000 avocados daily and sells them at the market for \$5 each.

$\Rightarrow$ Product = 1,000 avocados $\Rightarrow$ Revenue = $1000 \times \$5 = \$5{,}000$

Miguel hires an extra farmer called Antonio to help harvest avocados. As a result, Miguel and Antonio harvest combined total of 1,500 avocados, and sell at market for \$7,500.
Antonio (the second worker) produces an additional 500 (1,500 – 1,000) avocados, so his MPP is 500 units/avocados.
He also increased revenue by (\$7,500 - \$5,000) = \$2,500, so his MRP is \$2,500.

Factors Influencing MPP of Labour

1. **Quality of other factors:** The productivity of a given factor (like labour) depends on how well it works with other factors. For example, a factory worker using modern, efficient machinery will produce more widgets per hour than the same worker using outdated equipment. Similarly, better management practices (efficient scheduling, reducing downtime) can allow each worker to contribute more to output.
   In economics terms, complementary factor quality shifts the MPP curve upward – the same labour input produces more output.
2. **Diminishing marginal returns:** The Law of Diminishing Marginal Returns states that in the short run, as additional units of a variable factor (e.g. labour) are added to fixed factors (e.g. machinery, factory space), the extra output from each additional unit will eventually fall.
   Initially, MPP may increase due to specialisation. More workers mean tasks can be divided efficiently. But beyond a certain point, overcrowding and inefficiencies emerge (too many cooks spoil the broth), leading to a decline in MPP.
3. **Staff training:** Training improves the *human capital* of workers (knowledge, skills, and techniques that raise efficiency). Trained staff make fewer mistakes, work faster, and use technology more effectively. This increases the MPP for each worker.
   For example, in a restaurant, properly trained chefs can prepare dishes faster and to a higher standard, increasing the number of meals served per hour.

Factors Influencing MRP of Labour

MRP Curve for Labour = Labour Demand Curve

1. **Productivity of the factor (e.g. labour):** Higher MPP directly increases MRP since MRP is proportional to MPP. If a worker produces 10 extra units per day and each sells for €5, the MRP is €50. If training or better tools increase MPP to 12 units per day, MRP rises to €60, assuming the price is unchanged.
2. **Product selling price:** In perfect competition, the price per unit is given, so changes in market conditions that increase the selling price directly raise MRP. In imperfect competition, price may fall as output rises due to downward-sloping demand, so firms consider marginal revenue instead of just price.
   If a bakery can sell bread at €2 per loaf, producing 5 extra loaves adds €10 to revenue. If the market price rises to €2.50, the same MPP now generates €12.50.
3. **Elasticity of demand:** If demand for the product is price inelastic, the firm can raise prices without losing many sales – sustaining higher selling price per unit.
   This keeps MRP high even as output increases. Conversely, if demand is highly elastic, price must be reduced significantly to sell more output, which lowers MRP for each extra unit of the factor.
   A patented medicine (inelastic demand) allows the producer to sell at a high price, giving a high MRP for pharmacists. In contrast, a commodity like wheat (elastic demand in export markets) faces rapid price drops if supply rises, reducing MRP.

Factors Influencing Demand for Labour

1. The Wage Rate: If the wage rate the worker is seeking is higher than the revenue that the worker generates then this worker will not be demanded.
2. Demand for Output: If demand for the firm's output increases then this may lead to an increased demand for labour. During the Celtic Tiger, there was a surge in demand for housing. As a result, demand for construction workers exploded. In fact, demand for construction worker and tradesmen was so high that the industry relied on immigrants coming in from other parts of the EU to fill shortages in the labour market.
3. Price of Other Factors of Production (including capital): Prior to employing more labour the firm would compare the cost of the additional labour with that of other factors of production available to determine which is the most competitive.
4. State Subsidies: If the state were paying subsidies for the hiring of additional labour then this would make labour more competitive and increase demand.
5. Availability of Technology: A firm's demand for labour will be affected by the availability of new technologies, particularly if it helps to reduce costs. As the scope for machine learning and automation takes hold, its likely that demand for labour in some areas will be phased out.
6. Trade Union Involvement: If a worker is a member of trade union then the firm may not employ this worker. This applies particularly to some firms in Ireland, which operate without the involvement of trade unions. Unionised workers can cause strikes, unrest and inefficiency.

Using MRP to determine wages isn't always appropriate

- **Physical output not always produced**. Many jobs particularly in public sector are services/no tangible end products, so it is difficult to measure output, thus making it difficult to measure Marginal Physical Product (MPP) and consequently MRP.
- The goods/services produced within public sector are often **not sold on the open market or at market prices**. So estimating price or marginal revenue is difficult, if not impossible in such cases.
- **Value added by other factors isn't always clear**. When capital and labour are used together it is difficult to estimate the marginal productivity is of labour alone.

Factors Affecting Labour Supply (Ireland, 2024–2025)

Population and Migration
A larger working–age cohort shifts labour supply right. As of Apr 2024, Ireland's population stood at 5.38m, with strong net inward migration.

Wages & labour demand
Higher real wages (wages adjusted for inflation) attract workers (substitution effect). Average hourly earnings increased from €30.21 in Q4 2024 to €31.72 in Q1 2025.

Labour Market Participation
Childcare, education, health, and cultural norms all influence how much of the working-age population participate in the labour market. For context the Irish participation rate was 65.5% as of Q4 2024, while the employment rate (15–64) was 74.3%.

Tax Policy
Lower income tax/USC and a higher wage floor raise post-tax earnings, which can boost labour supply. We will explore tax policy on labour in more detail in the fiscal policy chapter.

Hours & work arrangements
Part-time/remote options make the labour market more lift effective supply of workers. Total weekly hours were 85.6m as of Q4 2024, a $+3.8\%$ change year on year.

Sources: CSO LFS & ELC 2024–2025; CSO *Year in Numbers 2024*; Budget 2025; gov.ie/Citizens Information.

Minimum Wage: Advantages/Disadvantages

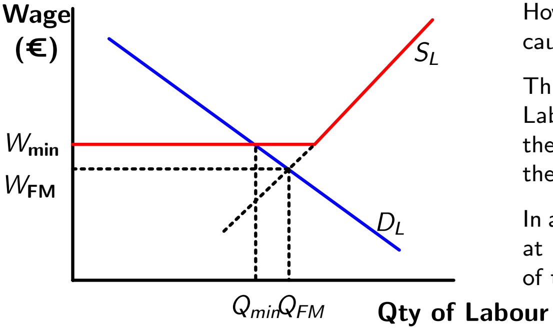
Disadvantages	Advantages
Increases the cost of business. Businesses and unions may argue against increasing min. wage as it would lead to an increase in their cost of production which may make it harder for businesses to survive.	**Introduce a more equitable distribution of income.** People who were on lower levels of pay will now receive a higher minimum level of pay and this helps to re-distribute wealth within a country.
Cost push inflation. Increasing the minimum wage may lead to increased cost of production which may be passed on to the consumer in the form of higher prices.	**Protection of the most vulnerable under law.** Workers who may be vulnerable are now better protected by law from exploitation by unfair employers.
May increase unemployment. While more employees may be willing to work, firms may counteract the increasing costs by cutting the workforce. This may leave lower employment than before min wage was raised.	**Boost economic growth.** Higher incomes will mean increased spending within the economy. This could boost aggregate demand, increasing consumption and thus help grow output.
Deterrent for FDI. Firms invested in Ireland from abroad may find the increase in the cost of production to be a deterrent. Existing firms relocate to other low-cost countries. New firms avoid investing in Ireland.	**Increase the incentive to work.** When workers see that pay levels are rising then it may attract more people into the workforce / help retain current workers / help increase productivity.

Context Ireland 2025: NMW **€13.50/h** from Jan 2025; cumulative rise since 2020 $\approx$ 38% (alongside high inflation and tight labour market).

The Labour Market: Determining Wages

A trade union may successfully argue for a minimum wage to protect its members interests.

If the minimum wage is set at W_{MIN}, then no Labour will be supplied below this wage and as such the portion of the supply curve AB no longer applies.



However, unbeknownst to most people, minimum wages cause unemployment.

This is because higher wages reduces the demand for Labour and as such the employer will hire less workers then he would have been willing to hire at a wage below the minimum wage.

In a free market, workers would be willing to supply labour at a rate below the minimum wage, (the dotted portion of the supply curve).

If there's no minimum wage, the quantity of labour both demanded and supplied would be Q_{FM}, (this is the quantity of labour that would employed in a free market). However because of the minimum wage only (the quantity demanded due to the minimum wage) is demanded, resulting in unemployment.

$$Q_{FM} - Q_{min} = \text{additional unemployment due to minimum wage}$$

Analysing the Irish Labour Market

While the minimum wage is generally accepted as a mainstay in the modern Irish economy, it has an immensely harmful effect on the labour market. Minimum wages can prevent a market correction when demand for labour is low, say for example during a recession. The artificially high minimum wage causes higher supply of labour than there is demand for it. Calling on our knowledge from Chapter 4, this is excess of supply or a surplus of labour.

In order to clear this surplus, the price of labour (wages) must fall. However, working for a wage below the minimum is illegal so the market is stuck with this surplus of labour until demand for labour rebounds.

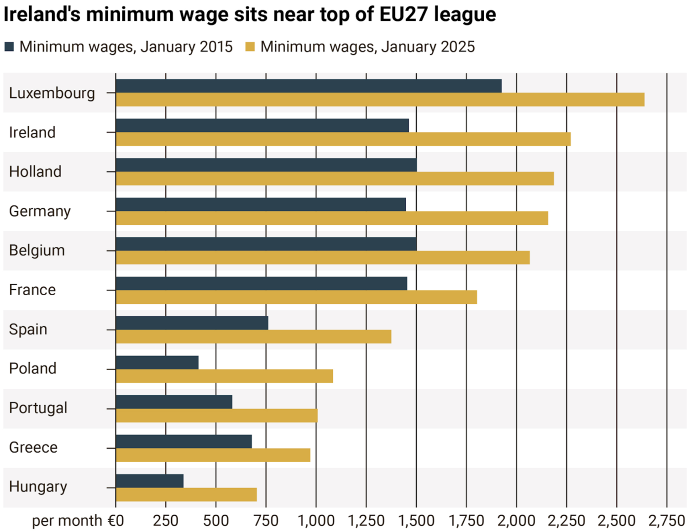
It is important to say that eliminating the minimum wage may not eliminate unemployment. It is just that a minimum wage creates additional unemployment when demand for labour is low.

You may find yourself asking surely there's a way of improving/replacing this policy. In this book 'Capitalism and Freedom' Milton Friedman proposes a negative income tax in conjunction with a free labour market. This would mean wages driven by supply and demand (allowing for market correction) but the State stepping in to ensure a minimum level of income.

Question Time

Imagine you're a policy advisor to the Minister for Finance. Analyse the case for and against a negative income tax to replace the current minimum wage system. Remember to structure your response into points, each with a statement and explanation.

Minimum Wages in the EU



Graphic by The Times and The Sunday Times. Source: Eurostat

Geographic Mobility of Labour

Geographic Mobility – Definition

Geographic mobility refers to the ease with which workers can move from one area to another, in order to supply their labour.

- Investment into housing: the lack of affordable housing impedes mobility. If housing were made available in underutilised areas it could be an incentive for re-location.
- Funding for educational institutions: the provision of schools; colleges and institutes may make these areas attractive.
- Increased infrastructural development: in these areas such as improved transport facilities; social infrastructure make these areas more attractive for relocation.
- Improve access/affordability to those supports needed for remote working. Providing internet access rural working hubs could help to achieve this objective.

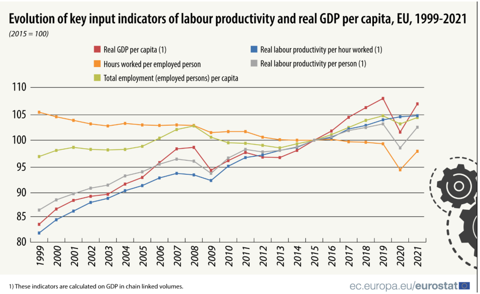
Occupational Mobility of Labour

Occupational Mobility – Definition

Occupational mobility refers to the ease of moving from one job to another.

- Investment in education/training: offer better training and educational opportunities at accessible costs so workers can diversify their skillset. The €2000 relief on university fees shows this is a priority for the government.
- Deregulation of industry: lift regulatory barriers, making it easier and more affordable to obtain work permits and enter new professions.
- Decrease trade union influence: as well as the state, trade unions can restrict entry into a profession and hence workers may find it harder to change jobs – by removing barriers imposed by unions, workers are free to supply labour.

Factors Impacting Labour Efficiency



Management quality & incentives: effective managers seek to get the most out of their workers. For example, by offering bonuses or holidays to reward productivity.

Level of Occupational Specialisation: a specialised worker is able to hone in very specifically on a particular task so they can operate more efficiently than a jack-of-all-trades.

Human capital: generally speaking, the better a worker's training, the more efficient they will be – plumber with three years apprenticeship will be well equipped as a productive worker, and may produce higher output.

Working conditions: better working conditions tend to make workers more productive. An accountant in a damp, poorly ventilated messy office is likely to be less efficient than one with a clean, safe, comfortable office.

Innate ability/talent those with special innate abilities, like a highly skilled engineer, can make them more productive.

Why are Some Workers Paid More Than Others?

1. Educational requirements: a worker's salary generally indicates the educational qualifications needed to gain access to that profession.
2. Type of work/tasks: harder/more difficult work commands higher wages - miner who undertakes dangerous work commands high wages.
3. Possession of innate talent: some people inherit or develop incredible skills, enabling them to earn huge incomes, such as the aforementioned Ronaldo and Justin Bieber.
4. Trade union power: a strong trade union can negotiate better pay for its workers, e.g., SIPTU have been effective at collective bargaining on behalf of its members.
5. Level of skill: a worker who develops greater professional skills can yield higher wages – a doctor earns more than a nurse even though both work in broadly the same field.

The Gender Pay Gap – Why Does it Exist?

Country	< 25 years	25–34	35–44	45–54	55–64	65 years +
Belgium	-8.3	-5.0	-0.1	1.2	8.0	3.9
Bulgaria	6.9	16.8	21.0	14.3	2.9	-8.7
Czechia	8.2	13.0	21.1	20.9	13.0	8.3
Denmark	5.7	11.1	14.2	17.0	16.3	10.6
Germany	1.7	8.4	16.4	22.8	26.3	9.2
Greece	-4.4	6.1	12.5	15.9	19.2	25.1
Ireland	1.0	4.9	8.5	11.1	13.2	9.1
Spain	0.4	2.9	8.7	10.8	12.6	33.3
France	-7.2	5.7	11.9	14.4	21.4	7.3
Croatia	3.9	6.4	9.4	11.3	5.8	6.4
Italy	8.3	2.7	4.4	4.5	3.3	7.7

Gender pay by age group across selected European countries, 2023

Balancing work and family responsibilities: some women work shorter hours and often part-time to combine family responsibilities and paid work. Career progression can be interrupted by maternity leave.

'Glass ceiling'/fewer women in senior and leadership positions: women are underrepresented in most senior positions, in politics and in certain sectors within the economy such as on boards of management.

Different jobs, different sectors: women and men carry out different jobs and often work in different sectors. In health and social work women make up 80% of workers.

Undervaluing of women's work and skills: women's skills and competencies are often undervalued, especially in occupations where they are in the majority. This is reflected in lower rates of pay.

Types of Capital

Capital

- Social capital is made up of assets held by the general public like libraries.
- Fixed capital refers to stock of fixed assets, like plant, machinery and transport vehicles.
- Private capital consists of the private property held by and individual or household like family car.
- Working capital describes the stock/inventory of raw materials, unfinished goods and goods available for sale.

For those of you doing accounting, this definition of working capital is a little different from working capital in a company's balance sheet. In accounting:

$$\text{Working Capital} = \text{Current Assets} - \text{Current Liabilities}.$$

So if you're defining Working Capital in your economics exam, make sure you're using the definition in the blue box above, unless the question tells you otherwise.

Factors Impacting Production of Capital Goods/Investment

Investment in capital goods is vital for economic progress – consider an accountant using an abacus as opposed to using a high-tech computer to do their job. Investment allows us to carry out our tasks more efficiently (greater output in less time).

Investment is affected by a variety of factors including:

1. Confidence/outlook of the business sector: optimism among business people provides the necessary risk-taking to bring in FDI.
2. State of technology: good use of technology (high-speed broadband, mechanised production and modern telecommunications) can make investments more profitable, efficient and attractive. Technological innovation is brought about by research and development.
3. Cost of capital goods: if a firm is looking to expand its operations, they will seek low prices for machinery, plant and vehicles in order to do so. If capital proves too costly, the level of investment will fall, and vice versa.

Enterprise

Enterprise differs from other factors of production as it has the following characteristics:

1. Return is residual: rent, wages and interest must be paid first. Only when these payments have been made can the entrepreneurs.
2. Non-insurable risks: risks which an entrepreneur cannot insure against occurring and an insurance policy cannot be purchased to provide compensation.
3. Can earn a loss: rent, wages and interest payments are obligated by contract and must be paid. This is not the case for profit.

The types of profit (return on enterprise) are (1) subnormal (2) normal (3) supernormal.

Role of Enterprise

Enterprise is an important part of the market economy – here's why:

1. They facilitate specialisation – a clothes shop will hone in on what it is good at, i.e., selling clothes. The remainder of activities are bought from other specialist firms like clothes manufacturers, marketing, accountants.
2. They provide various options (choice) to a market need – a plethora of different firms are often needed to cater for the wide spectrum of consumer tastes within a market. One firm would unlikely be able to cater for these varying needs.
3. They create employment – consumers require a source of disposable income with which to pursue their needs and wants. Enterprises provide this necessary income.
4. Raise state revenue – enterprises boost exchequer receipts, enabling the state to provide high-quality public services. Ireland in particular is dependant on corporation tax as a source of taxation revenue.
5. Organise economic activity – entrepreneurs aim to use factors of production to solve the economic problem of producing goods and services by taking risk in the hope of earning profit.