David Ricardo and the Classical Theory of Economic Rent

Vince Sammut

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“Rent is that portion of the produce of the earth which is paid to the landlord for use of the original and indestructible powers of the soil.”

DAVID RICARDO (1772–1823)

Introduction

The British economist David Ricardo was one the most important figures in the development of economic theory. He articulated and rigorously formulated the “Classical” system of political economy and his legacy dominated economic thinking throughout the 19th Century.

David Ricardo's family was descended from Iberian Jews who had fled to Holland during a wave of persecutions in the early 18th Century. His father, a stockbroker, immigrated to England shortly before Ricardo's birth in 1772. David Ricardo was his third son (out of seventeen!).

Ricardo's interest in economics was sparked by a chance reading of Adam Smith's *Wealth of Nations* (1776) when he was in his late twenties. Bright and talkative, Ricardo discussed his own economic ideas with his friends, notably James Mill. But it was only after the persistent urging of the eager Mill that Ricardo actually decided to write them down. He began in 1809, authoring newspaper articles on currency questions which drew him into the great Bullionist Controversy that was raging at the time. In that affair, he was a partisan of the Bullionist position, which argued for the resumption of the convertibility of paper money into gold. He wrote a pair of tracts (1810, 1811) articulating their arguments and outlining what has since become known as the “classical approach” to the theory of money.

In 1815, Ricardo published his groundbreaking *Essay on the Influence of a Low Price of Corn on the Profits of Stock showing the inexpediency of Restrictions on Importation*. There he introduced the differential theory of rent and the "law of diminishing returns" to land cultivation. In this Essay, Ricardo formulated his theory of distribution in a one-commodity (“corn”) economy. With wages at their “natural” level, Ricardo argued that the rate of profit and rents were determined residually in the agricultural sector. He then used the concept of arbitrage\(^1\) to claim that agricultural profit and wage rates would be equal to their counterparts in the industrial

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\(^1\) In economics, arbitrage is the practice of taking advantage of a state of imbalance between two (or possibly more) markets. A combination of matching deals is struck that exploit the imbalance, the profit being the difference en the market prices.
sectors. With this theory, he could show that a rise in wages did not lead to higher prices, but merely lowered profits.

Later, Ricardo realised that in a multiple-commodity economy, for rents and profits to remain residuals, prices must then be pinned down somewhere. In his formidable treatise, Principles of Political Economy and Taxation (1817), Ricardo finally articulated and integrated a theory of value into his theory of distribution.

For Ricardo, the appropriate theory was the "labour-embodied theory of value" or LTV, i.e. the argument that the relative "natural" prices of commodities are determined by the relative hours of labour expended in their production.

However, Ricardo realised that when the question of capital comes in, a problem arose: specifically, as different industries apply different amounts of capital per labourer, then the rate of profit will also differ across industries. Ricardo understood that if he then assumed that the rates of profit across different industries were equalised (as free competition would imply), then, mathematically, relative prices would vary with wages. Ricardo realised that the labour theory of value would only work if the degree of capital-intensity was the same across all sectors, casting doubt on the generality of his cherished theory.

Ricardo proposed two ways out of this dilemma. The first was the empirical argument that firms apply capital in a roughly proportional manner to the amount of labour invested. In this case, the resulting prices when profits are equalised would not differ much from the values implied by the LTV. The second solution was to find a commodity which has the average capital per worker, so that its price would reflect labour-embodied value and thus not vary with changes in distribution. He called this the "invariable standard of value". If one can find what this "standard" commodity is, Ricardo argued; then the rest of the analysis is simple. One can, say, change technology, trace the change in value of the standard commodity, and then extrapolate the change in value for all other commodities by the degree to which their capital composition deviates from this standard. Despite his search, Ricardo never found this standard commodity.

A little tripped up on value, Ricardo pressed on nonetheless. With prices (more or less) pinned down by the LTV, he restated his old theory of distribution (1817). Dividing the economy into classes of landowners (who spend their rental income on luxuries), workers (who spend their wage income on necessities) and capitalists (who save most of their profit income and reinvest it), Ricardo showed once again how the size of profits is determined residually by the extent of cultivation on land and the historically-given real wage. He then added on a theory of growth.

The economic functions of the social Classes

- **Workers** produce and receive a subsistence wage. This is determined by the market forces of demand and supply.

- **Landlords** have no economic function and receive rent, which is the difference between the output in the most fertile and least fertile lands in cultivation. This is a residual after the payment of wages.

- **Capitalists** save, accumulate capital, organize and bear risk for which they receive profit. This is a residual after the payment of wages and rent.
Specifically, with profits determined in the manner given above, then the amount of capitalist saving, accumulation and labour demand growth, could also be deduced. This, in turn, would increase population and thus bring more land, of less and less quality, into cultivation. As the economy continued to grow, then, by his theory of distribution, profits would be eventually squeezed out by rents and wages. In the limit, Ricardo argued, a "stationary state" would be reached where capitalists will be making near-zero profits and no further accumulation would occur.

Figure 1: As the economy grows, rents rise, squeezing profits and leading the economy into decline.

**The End of Capitalism?**
Ricardo suggested two things which might hold this law of diminishing returns at bay and keep accumulation going at least for a while: technical progress and foreign trade. On technical progress, Ricardo was ambivalent. One the one hand, he recognised that technical improvements would help push the marginal product of land cultivation upwards and thus allow for more growth. But, in his famous Chapter 31 "On Machinery" (added in 1821 to the third edition of his *Principles*), he noted that technical progress requires the introduction of labour-saving machinery. This is costly to purchase and install, and so will reduce the wages fund. In this case, either wages must fall or workers must be fired. Some of these unemployed workers may be mopped up by the greater amount of accumulation that the extra profits will permit, but it might not be enough. A pool of unemployed might remain, placing downward pressure and wages and leading to the general misery of the working classes. Technical progress, for Ricardo, was not a many-splendourned thing.

On foreign trade, Ricardo set forth his famous theory of comparative advantage. Using his famous example of two nations (Portugal and England) and two commodities (wine and cloth), Ricardo argued that trade would be beneficial even if Portugal held an absolute cost advantage over England in both commodities. Ricardo's argument was that there are gains from trade if each nation specialises completely in the production of the good in which it has a "comparative" cost advantage in producing, and then trades with the other nation for the other good. One may note that the differences in the initial position mean that the labour theory of value is not assumed to hold across countries, as it should be. This is because, Ricardo argued, factors of production, particularly labour, are not mobile across borders.

As far as growth is concerned, foreign trade may promote further accumulation and growth if wage goods (not luxuries) are imported at a lower price than they cost domestically, thereby leading to a lowering of the real wage and a rise in profits. But the main effect, Ricardo noted, is that overall income levels would rise in both nations regardless.

With his 1817 treatise, Ricardo took economics to an unprecedented degree of theoretical sophistication. He formalised the Classical system more clearly and consistently than anyone before had done. For his efforts, he acquired a substantial following in Great Britain and elsewhere for what became known as the "Classical" or "Ricardian" system. This system however, was improved very little by his disciples. Perhaps only John Stuart Mill (1848) and Karl Marx (1867-94) added insights of any great weight. As a result, Ricardo's theory gradually fell out of favour, and died a slow death soon after the Marginalist Revolution of 1871 - 1874.

### Assumptions on which Classical theory is based

- **Say's law** - Supply creates its own demand, and whatever is saved is invested (accumulated).

- **Labor theory of value** - Prices are proportional to the quantities of embodied labour.

- **Agriculture is labour intensive, manufacturing is capital intensive.**
A highlight of Ricardo’s reasoning:

The accumulation of capital is a function of profits and savings; profits and savings in turn depend on wages and the extent of cultivation on land.

- Wages reflect the price of food, which depends on the availability of land or of imported food.

“The natural price of labour is “that price which is necessary to enable the labourers, one with another, to subsist and to perpetuate their race, without increase or diminution.” (Ricardo, 1817)

Note: this is the classical assumption about labour wages; labour supply is perfectly elastic and wages are at the subsistence level.

- Thus wages depend on the price of food and of other necessary expenditures.

- But the natural price of labour is not necessarily fixed and constant – It varies at different times and in different countries.

“It essentially depends on the habits and customs of the people…many of the conveniences now enjoyed in an English cottage would have been thought luxuries at an earlier period of our history.”

- In this sense, the natural wage is socially determined.

- However, the market price of labour tends toward the natural price for the same reasons put forward by Malthus, that is:

“As wages rise, people are better off, population increases and wages fall - if the wage is below natural rate, population falls and the wage will rise back to the subsistence level.”

- As the extensive margin of land is approached, the return to land (rent) rises.

- According to Ricardo, rent only arises when marginal land must be brought into cultivation. That is, due to the scarce nature of agricultural land.

- Farmers and firm owners must pay landowners higher rents.

- Food prices rise as agricultural productivity falls so wages of workers must increase proportionately.

- So profits will fall to near zero in both the agrarian and manufacturing sectors.

- It is the landowning class who gain.

“Thus the landlords alone, who do naught but collect rent, who contribute nothing to the progress of society, get wealthier and wealthier, while the rest of society - both capitalists and labourers - get poorer and poorer.” (Ricardo, 1817)
In his original model, Ricardo believed that the problem of declining profits could be offset by technological improvements in machinery.

- But in the third edition, he claimed that machinery would displace labour.
- Labour thus, “set free” would depress wages and lower labour income.
- But wages could not fall below their “natural rate”, the subsistence level.
- Declining profits and rising rents result in the economy reaching a “stationary point” were growth is no longer possible.

“*The produce of the earth - all that is derived from its surface by the united application of labour, machinery, and capital, is divided among three classes of the community, namely the proprietor of the land, the owner of the stock or capital necessary for its cultivation, and the labourers by whose industry it is cultivated. But in different stages of society, the proportions of the whole produce of the earth which will be allotted to each of these classes, under the names of rent, profit, and wages, will be essentially different; depending mainly on the actual fertility of the soil, on the accumulation of capital and population, and on the skill, ingenuity, and instruments employed in agriculture. To determine the laws which regulate this distribution is the principal problem in Political Economy…*(Preface).”
Major Works of David Ricardo

(b) Reply to Mr. Bosanquet's Practical Observation on the Report of the Bullion Committee, 1811.
(c) An Essay on the Influence of a Low Price of Corn on the Profits of Stock showing the inexpediency of Restrictions on Importation; with remarks on Mr Malthus' two last Publications 1815 - (2nd Copy).
(d) Proposals for an Economical and Secure Currency, with Observations on the profits of the Bank of England, as they regard the Public and the Proprietors of Bank Stock, 1816.
(e) On the Principles of Political Economy and Taxation, 1817 (Copy (1) (2))
(f) Notes on Malthus' Principles of Political Economy, 1820 (publ. 1928).
(g) "Funding System", 1820, Encyclopedia Britannica (Supp.)
(h) On Protection in Agriculture, 1822.
(i) Mr Ricardo's Speech on Mr Western's Motion, for a Committee to consider the Effects produced by the Resumption of Cash payments, 1822.
(j) Plan for the Establishment of a National Bank, 1824.

David Ricardo
(1772-1823)

English economist and politician, born in London. He set up in business as a young man, and by 1814 had made a fortune. In 1817 he published his main work, Principles of Political Economy and Taxation. In 1819 he became a Member of Parliament, and was influential in the free-trade movement. Despite his own considerable practical experience, Ricardo's writings are abstract and frequently difficult. His law of rent was probably his most notable and influential discovery.

It was based on the observation that the differing fertility of land yielded unequal profits to the capital and labor applied to it and, hence, differential rent. This principle was also noted at about the same time by Malthus and others.

His other great contribution, the law of comparative cost, or comparative advantage, demonstrated the benefits of international specialization as regards the commodity composition of international trade. This was at the root of the free trade argument, which set Britain firmly on the course of exporting manufactures and importing foodstuffs.

Prepared by Vince Sammut
The Market for Inputs

When one thinks about inputs, that is the things used to produce the goods or services purchased in the output market such as health, education, automobiles, or homes, factors of production such as land, labour, capital and entrepreneurship come to mind.

Moreover, it is often asked: Why does X earn more than Y? Why aren’t all jobs well paid? Why does a sports car driver, such as Michael Schumacher earn more than a heart surgeon or an accountant more than a secretary? In other words, what determines wage rates and what determines the returns to other factors of production?

Inputs and their Prices

<table>
<thead>
<tr>
<th>Labour</th>
<th>Land</th>
<th>Capital</th>
<th>Natural Resources</th>
<th>Entrepreneurship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages</td>
<td>Rent</td>
<td>Interest</td>
<td>Price</td>
<td>Profit</td>
</tr>
</tbody>
</table>

Input prices\(^2\), just like output prices, are set in markets. However while firms are the sellers in the output market, firms are the ‘demanders’ in the inputs market. Households, meanwhile, are likely to be the ‘sellers’ in the inputs market.

The Input Market

Figure 2: Market demand and supply in a freely competitive input market.

\(^2\) When one looks at the markets and the prices of these inputs, especially in the long-term, one very important adjustment about the prices of these inputs needs to be made. For example, if wages increase, but the prices one pays for things increased even more, then the wage increase would not suffice for purchasing more. As a result, one would certainly feel worse off.

This does not apply merely to wages. It turns out that when using any variables measured in terms of money such as income, earnings, sales, profit, GNP, care must be taken when interpreting changes in these variables over time. To avoid, or to correct for the distortion caused by rising prices, economists construct a new variable known as the real, constant, or inflation-adjusted variable. With this adjustment in mind, one may use the supply and demand model to explain what happens to input prices.
**Key Points**

A. **Factors of production** are the resources used to produce goods and services. The factors of production are **labour**, **capital**, **land**, and **entrepreneurship**.

B. **Factor prices** determine incomes:

1. Labour earns **wages**.
2. Capital earns **interest**.
3. Land earns **rent**.
4. Entrepreneurship earns **normal profit**.
5. **Economic profit** (or loss) is paid to (or borne by) the owner of the firm.

C. Factors of production are traded in markets where their prices and quantities are determined by the competitive market forces of factor demand and supply.

1. The laws of demand and supply apply to a competitive factor market: the demand curve slopes downward and the supply curve slopes upward.

2. The income earned by the owner of a factor of production equals the equilibrium price multiplied by the equilibrium quantity.

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**ECONOMIC RENT**

*is the return to a factor of production for which there are no substitutes or no “good” substitutes; such as land, a particular location, a living legend, etc.*

**Key Concepts:**
- Derived Demand $\Rightarrow$ MRP
- Fixed Total Supply,
- Perfectly Inelastic Supply,
- Changes in Demand,
- Free Goods.
The Optimal Choice of Inputs

The choices made by firms seeking to maximise their profit would be affected by changes in either costs or revenues and these firms would be guided by the rule:

\[ MC = MR. \]

A firm would expand production when marginal revenue exceeds marginal cost (\( MR > MC \)), and cut back on production when the marginal revenue of the output is less than the marginal cost of the output (\( MR < MC \)).

Looking at the firm's decisions in the market for inputs or resources is no different. They will hire inputs as long as the marginal revenue of the input (\( MR \)) is greater than the marginal cost of the input (\( MC \)), and they will cut back on their use of the input if marginal revenue is less than marginal cost (\( MR < MC \)).

But what is the MR of an input? To answer this question one must keep in mind the important concept of marginal physical productivity or (MPP). The concept is marginal revenue product (MRP), which is defined as: “the additional revenue obtained by selling output produced by 1 more unit of input’ is simply the measure of how much revenue an additional unit of input will create. (MPP multiplied by the price of the good or service produced) For example, if one is hired as a typist, he/she will be paid according to how many documents he/she can type and how much the employer can charge his customers for this service.

Optimal input choice rules for a profit maximizer

Short run

The short-run condition is simply a variation on the \( MR = MC \) rule, except that here, one is studying the MR and MC of an additional unit of input. The rule for use of inputs in the short run is that a firm will maximise profit if the Marginal Cost of the input (\( P_A \)) equals the Marginal Revenue generated by the input (\( MRP_A \)), and as long as the MRP is greater than the price of the input, more of the input should be employed. The formula is given below:

\[ MRP_A = MR \times MP_A = P_A \]

A firm should keep hiring an input as long as the marginal revenue generated by the firm is greater than the price of the input, and stop hiring when they are equal. What makes this a little more difficult is that the marginal revenue of the input actually has two components - the price of the product and the productivity of the input. Based on the equation, one may see that demand for an input will increase if the input is more productive or the price at which the firm sells the output increases.

Long run

In the long-run the firm will follow the same process, except here the firm will have the choice of a mix of inputs as all inputs are assumed to be variable. In the short-run, the optimal choice decision was based on the assumption that only one input could be varied, while in the long-run firms have more degrees of flexibility and they will choose inputs in a way that is related to their prices. If there are two inputs, they will choose inputs such that one € spent on input A will generate the same revenue as the last € spent on input B. Two versions of the formula are given below:

\[ (1) \quad \frac{MRP_A}{P_A} = \frac{MRP_B}{P_B} \]
\[ \text{or} \]
\[ (2) \quad \frac{MRP_A}{MRP_B} = \frac{P_A}{P_B} \]

What the equations tells us is that as the price of an input increases, the profit maximising firm will tend to shift the mix of inputs so that it will use less of the more expensive input.
Background to the theory of Economic Rent

- A series of statutes enacted between 1815 and 1846 intended to protect the interests of English landowners and farmers by hindering the import of lower-priced foreign grain following the end of the Napoleonic Wars.
  - Another stated goal was to stimulate domestic production of grain (self-sufficiency).
  - The first of these laws stated that no corn could be imported until grain was at 80 shillings per quarter.

- Landowners were the main beneficiaries as competition for land (to grow high priced grain) resulted in high rents.

- Urban dwellers were worse off since they had to spend much more of their income on grain.
  - Workers could not afford manufactured goods, so manufacturers laid off workers and their businesses suffered.
  - This led to higher unemployment and increased hardship for all but the landowning class.

- Reform in 1828, when grain could be imported when the prevailing price was above 73 shillings per quarter, and a sliding scale of tariffs for prices below that.

- As the merchant class gained more political control in the 1830s and 1840s, parliament became more responsive to the arguments against the protection of agriculture (The Reform Act, 1832)

- The corn laws were abolished in 1846

Learning Ricardo’s Theory is Important for the Following Reasons:

- It explains in simple terms the economic reason for rent.

- It explains, up to a degree, why income inequalities exist.

- It explains why, in Ricardo’s view, investment opportunities and economic growth decline.
Land and Economic Rent

At present, it is a good time to be a landowner in Malta. One cannot not be aware of the large number of homes, hotels, offices, and retail outlets that have been built all over the Maltese islands in recent years. Wouldn’t anyone have loved to own that land before it was sold off to a property developer?

But, on the other hand, imagine being the owner of land sited in an area that has just been earmarked as an ‘engineered land fill’ or a ‘waste recycling’ site, a power station or a reverse osmosis plant!

The unique feature of land, and the one that makes most people think of it as a wonderful long-term investment, is that it is in fixed supply. So, as demand increases over time its price will rise. On the other hand, if demand is so low that there is no rent to be determined, land is said to be free good, commanding no rent.

Rent, like wages, has always been notorious for attracting Government control. In the case of land, the government tries to keep rents down, while in the case of labour, the government tries to keep wages up.
The framework for describing the price of land is the traditional supply-demand model. Demand for land is similar to what we see in other markets - as the price rises there will be less demand for land.

Figure 3: The negative relationship between price and quantity demanded shows up as a negatively sloped demand curve. Any change in demand affects the size of economic rent.
What is unusual / unique about land is supply, which can be thought of as independent of price. The amount of land supplied to the market is independent of price - a situation where the supply curve would be a vertical line, what would be called a perfectly inelastic supply. If one combines this supply curve and demand curve, then the equilibrium rent is $P^*$, and if there is an outward shift in demand, then rent rises to $P^{**}$ with no change in the amount of land sold. In this situation any change in the price of land is determined solely by a change in the demand for land.

Furthermore, the change in price does not change the amount of land supplied, which leads to the definition of economic rent as: ‘the amount a factor of payment receives in excess of the minimum required to supply that factor’. In the case here, since the supply curve is vertical and thus the land would be supplied at a zero price, then all of the price would be called economic rent.

**Natural Resource Markets**

A. Natural resources, or what economists call land, fall into two categories:

1. **Renewable natural resources** are resources that can be used repeatedly, such as land (in its everyday sense), rivers, lakes, rain, and sunshine.

2. **Nonrenewable natural resources** are natural resources that can be used only once and that cannot be replaced once they have been used, such as coal, oil, and natural gas.

B. **The Supply of Renewable Resources**

1. The demand for natural resources as inputs for production is based on the same principle of marginal revenue product as the demand for capital. But the supply of natural resources is special.

2. The quantity of land (and other renewable natural resources) at any given time is fixed, which means the supply of land is perfectly inelastic.

3. The price (rent) for land and other renewable natural resources is determined solely by market demand.

4. The market supply curve for land is perfectly inelastic, but the supply curve facing any one firm in a competitive land market is perfectly elastic. Each firm can rent as much land as it wants at the going market price.

C. **The Supply of Nonrenewable Natural Resources**

1. For a nonrenewable natural resource, there are three supply concepts:

   a) The *stock* of a nonrenewable natural resource is the quantity in existence at any given time. This quantity (like the quantity of land) is fixed and is independent of the price of the resource.

   b) The *known stock* of a nonrenewable natural resource is the quantity that has been discovered. This quantity may increase over time because advances in technology enable ever less accessible sources to be discovered.
c) The flow supply of a nonrenewable natural resource is the rate at which the resource is supplied for use in production during a given time period.

2. The flow supply of a nonrenewable natural resource is *perfectly elastic* at a price that equals the present value of the next period’s expected resource price.

   a) The opportunity cost of selling a resource this year is the present value of the resource next year. *Figure 4* illustrates the flow supply of a nonrenewable natural resource

![Figure 4: A Non-renewable Natural Resource market](image)

b) If this year’s price exceeds the present value of next year’s price, owners sell this year. If this year’s price is less than the present value of next year’s price, owners hold on to their stock this year and plan to sell next year. These actions make the flow supply perfectly elastic at the present value of next year’s expected price.

V. Income, Economic Rent, and Opportunity Cost

A. Large and Small Incomes

1. Demand and supply in factor markets determines the equilibrium price and quantity of each factor of production and determines who receives a large income and who receives a small income.

   a) Large incomes are earned by factors of production that have a high marginal revenue product and a small supply. National news anchors are an example.

   b) Small incomes are earned by factors of production that have a low marginal revenue product and a large supply. Fast-food workers are an example.

B. Economic Rent and Opportunity Cost

1. The total income received by an owner of a factor of production is made up of its economic rent and its opportunity cost.
a) **Economic rent** is the income received by the owner of a factor of production over and above the amount required to induce that owner to offer the factor for use.

b) The **opportunity cost** of using this factor is the income required to induce the owner to offer the resource for use, which is the value of the factor in its next best use. Thus is also known as *transfer earning*.

2. **Economic rent** is different from *rent*, or the price paid to the owner of land as a factor of production. The portion of income comprised of economic rent depends upon the elasticity of supply for the factor.

   a) The less elastic is the supply for a factor; the greater is the share of income that is comprised by economic rent. When the supply is perfectly inelastic, then *all* of the income is comprised of economic rent.

   b) The more elastic is the supply for a factor; the smaller is the share of income that is comprised by economic rent. When the supply is perfectly inelastic, then *none* of the income is comprised of economic rent.
A case study application of the theory of economic rent

Mr Borg has decided to open a retail outlet in Main Street, Sliema and must choose between a ground floor location and a first floor walk-up. Despite his inexperience at sales, he knows that the two units are not the same even though the square footage and location are the same. They are not the same because more people will visit the ground floor store than will visit the first floor store, and even fewer will visit the second floor that has never been used as a store.

Some market research was carried out and it has been learned that the monthly profits (revenues – non-rental expenses) he could expect would be €0 for the third floor, €800 for the first floor and €1,000 for the ground floor.

Knowing this information, what is the maximum rent that Mr Borg would be willing to pay for the two stores - or from the landlord’s perspective, what is the highest amount that could be charged for rents on the three spaces?

For the ground floor Mr Borg would surely be willing to pay up to €1,000 in rent since anything less than that would give him an ‘economic profit’ (also known as ‘abnormal’ or ‘super-normal’ profit). Hence, if rent for the ground floor unit was €600; Mr Borg would be able to clear €400 in profit. Similarly, the maximum that Mr Borg would pay for the first floor would be €800 and he would be willing to pay nothing for the third floor. If he paid any rent on the third floor unit, then he would lose money, since profit without rent was zero.

As a test of your understanding of the concept of rent, let’s look at what would be the likely impact of an increase in demand for Mr. Borg’s retail space - the result of his Main Street outlet’s success in being recognised as an ‘in’ place. The new status would most likely generate greater foot traffic. This would translate into higher sales volumes, which in turn would show up in higher revenues and ‘before-rent’ profits. In this case one might find that profits would be €1,500, €1,000, and €200 respectively for the three floors. This would translate into an outward shift in the demand for the space and even higher rents would be expected as a result. In a competitive environment, the landlord would be able to get rents of €1,500, €1,000, and €200 and it would make the third floor rentable; so the retail space would increase.

What has happened here is also likely to happen in the market for agricultural land or sea-front property. In the case of agricultural land, population growth brings about an increase in the demand for food which in turn brings about an increase in the demand for farmland. At the Sliema sea front, meanwhile, population growth coupled with tourism and growth in the entertainment industry, has led to an increase in demand for seafront homes.

Through such an analysis of rent, one may gain some insight into the changing uses of land in urban areas. Under most situations there are competitive uses for land - it could be a park, a hotel, a factory, an office, or residential homes - and the land will end up going to the highest bidder. But who is the highest bidder and what happens to the bids over time? Clearly, the highest amount that someone would be willing to pay for land is equal to the profit generated from that land.

Consider two potential uses - a farm or a retail mall. In the beginning, the area surrounding the land in question was sparsely settled and the ten tumuli of land were used for growing vegetables at profit of €0.25 a kilo. There really was no interest in using the land for a mall since there would not be enough customers to generate enough revenue to cover the costs. The maximum rent that could be charged for the land was €150. Charge anything above that for rent and the farmer would be earning a loss.

But what would happen if there was a new road built through the area that brought with it new housing developments? Now there may be enough potential customers to consider opening a mall. Assuming that in the same ten tumuli, a mall with 12 stores could be opened with 10,000 square feet of retail space where each foot of space could generate a profit €100 per year. The
total rent that could be generated by the land used as a mall would now be €1,000,000. It should be clear what would now happen - and how a lot of money could be made by the individual who 'sees' it first.

Enormous sums of money were made by individuals who saw this coming and went to the farmers and made them a deal. They would pay the farmers €4,000 for the land, and the farmers considered this a good deal since it was much more than they made farming. Once the new owners had the land, they would turn to the mall developers and offer to rent the land for €900,000. Based on their projections of a €1,000,000 profit, the mall developers took the deal because they could see the €100,000 they could earn by doing it. And the "deal maker" made off with a cool €896,000.

There are two generalisations that can be made regarding the effect on land use of an increase in demand based on the process we have just examined.

- First, the increase in demand will mean that previously unusable, or unmarketable, land will be converted into usable land.
- Second, the increased demand for land will increase the intensity of land use as other factors of production are substituted for the more expensive land.

In considering the choice of inputs, firms would tend to substitute the cheaper for the more expensive inputs. Hence, the developer of the land could build more floors and add an elevator to reach the upper floors. This would increase the use of capital in the production process and would result in higher sales / profits for the parcel of land. It would make no sense to build a tall building with all its expenses when land is cheap.

This explains why modern urban developments are leaning towards high-rise buildings or skyscrapers. Such a trend is being adopted in Malta, a country with one of the densest populations in the world\(^3\).

\[^3\] Malta has a population density of 1,260 per Km\(^2\) the fourth highest after Monaco, Singapore and the Vatican City.
Economic rent and the salary of ‘living legends’

The term ‘economic rent’ is more broadly defined than the ‘price’ of land. Economic rent can be broadly defined as: “any payment made to a factor above the amount necessary to induce that factor to be supplied to its present employment, that is its opportunity cost or transfer earnings”.

Michael Schumacher, with his $60 million plus income, receives far more than other sportsmen; far more than the minimum necessary to induce him to drive a Ferrari F1 car. Indeed, athletes, singers or heart surgeons are very much like that plot of land on the Sliema sea front; they are unique. The price paid for the resource - the land’s rent or the athlete’s salary - are determined by demand, and demand is determined by the productivity of the resource; that is, their marginal revenue productivity. Moreover, the TV contracts that have enabled fans all over the world to appreciate - and pay to see - the skills of a great superstar, have helped in no small way to increase their incomes even more dramatically.

Application of Economic Rent Theory: Salaries of Professional Sportsmen…..

- **When sportsmen would be willing to ‘play’ for quite a bit less than their salary, the “excess” salary is economic rent.**

- **This same analysis applies to any factor of production whose supply curve is not horizontal.**

- **Only those factors that can be reproduced by a number of producers at constant cost earn no rents.**
Multiple Choice Questions

1) Land is fixed in supply. This fact means that the supply of land is

A) perfectly elastic.
B) perfectly inelastic.
C) unitary elastic.
D) elastic.

2) A natural resource is considered renewable if it

A) never has to rest.
B) cannot be replaced once it has been used.
C) is available at a price of zero.
D) can be used repeatedly.

3) Oil is an example of

A) a resource for which the true value of the resource cannot be measured.
B) a renewable natural resource.
C) physical capital.
D) a non-renewable natural resource.

4) Economic rent is the income over and above

A) average cost.
B) factor income.
C) marginal cost.
D) opportunity cost.

5) The income required to induce the supply of a given quantity of a factor of production is its / the

A) marginal cost.
B) value of the marginal product.
C) opportunity cost.
D) economic rent

6) A factor input’s opportunity cost is represented by its

A) quasi-rent
B) transfer earnings
C) marginal cost
D) economic rent

7) A reduction in the price of a firm's output

A) decreases the firm's demand for labour.
B) decreases the firm's supply of labour.
C) increases the firm's supply of labour.
D) increases the firm's demand for labour.

8) New technology

A) definitely decreases a firm's demand for labour.
B) definitely increases a firm's demand for labour.
C) could increase, decrease, or leave unchanged a firm's demand for labor.
D) definitely does not change a firm's demand for labor.

9) An increase in capital used in home production shifts the labour supply curve ________ and an increase in the adult population shifts the labour supply curve ________.

A) leftward; leftward
B) rightward; leftward
C) rightward, rightward
D) leftward; rightward

10) Which of the following groups lists the four factors of production?

A) labour, capital, land, money
B) labour, capital, land, entrepreneurship
C) labour, capital, money, entrepreneurship
D) labour, money, land, entrepreneurship

11) In the diagram above, the darkened rectangle is

A) the factor's deadweight loss.
B) the factor's income, which is composed entirely of the factor's opportunity cost.
C) the factor's income, which is composed of both economic rent and the factor's opportunity cost.
D) the factor's income, which is composed entirely of economic rent.
12) In the diagram above, the darkened area is

A) the factor's deadweight loss.
B) the factor's income, which is composed entirely of economic rent.
C) the factor's income, which is composed of both economic rent and the factor's opportunity cost.
D) the factor's income, which is composed entirely of the factor's opportunity cost.

13) If the demand for labor is elastic, then an increase in the supply of labour will lower the wage by a

A) larger percentage than the increase in the quantity of labour demanded, thus decreasing total labour income.
B) smaller percentage than the increase in the quantity of labour demanded, thus decreasing total labour income.
C) larger percentage than the increase in the quantity of labour demanded, thus increasing total labor income.
D) smaller percentage than the increase in the quantity of labour demanded, thus increasing total labour income.

<table>
<thead>
<tr>
<th>GOOD</th>
<th>LABOUR’S SHARE OF TOTAL COST (%)</th>
<th>ELASTICITY OF DEMAND FOR THE PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>10</td>
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<td>40</td>
</tr>
<tr>
<td>4</td>
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<td>50</td>
</tr>
</tbody>
</table>

14) Based only on the elasticity of demand for the goods in the above table, labour demand is least elastic in the production of

A) good 3.
B) good 4.
C) good 1.
D) good 2.

15) Based only on the elasticity of demand for the goods in the above table, labour demand is most elastic in the production of

A) good 4.
B) good 3.
C) good 1.
D) good 2.

16) Housing construction is a labour-intensive production process and automobile manufacturing is a capital-intensive production process. If wages increase by 10 percent in each industry, then the percentage decrease in the quantity of labour demanded is ________ in the construction industry because the demand for labor is ________ elastic in the construction industry.

A) greater; less
B) less; more
C) greater; more
D) less; less

17) Technological change has ________. On average the new jobs pay ________ than the old ones did.

A) created more jobs than it has destroyed; less
B) destroyed more jobs than it has created; less
C) created more jobs than it has destroyed; more
D) destroyed more jobs than it has created; more

18) Since the late 1960s

A) the labour supply curve has shifted rightward, but the labor demand curve has shifted leftward.
B) the labour demand curve has shifted rightward, but the labor supply curve has shifted leftward.
C) the labour demand curve has shifted rightward faster than the labor supply curve, which has also shifted rightward.
D) the labour supply curve has shifted rightward faster than the labor demand curve, which has also shifted rightward.

19) The marginal product of labour is the

A) change in total product produced by hiring an additional unit of labour.
B) revenue gained by employing one more unit of labour.
C) revenue gained by selling one more unit of output produced by hiring additional units of labour.
D) total revenue divided by units of labour.

20) A firm's marginal revenue product of labour curve

A) is its demand for labour curve.
B) is steeper than its demand for labour curve.
C) bends backward.
D) is flatter than its demand for labour curve.

21) The market supply of labour curve has a positive slope if higher wages induce households to choose

A) supplying labour in the labour market rather than leisure.
B) leisure rather than supplying labor in the labour market.
C) demanding labour rather than supplying it.
D) None of the above answers are correct.

22) An increase in the demand for a factor normally

A) lowers its equilibrium price but increases its equilibrium quantity.
B) decreases both its equilibrium price and its equilibrium quantity.
C) increases both its equilibrium price and its equilibrium quantity.
D) raises its equilibrium price but decreases its equilibrium quantity.

23) If the wage that must be paid to a worker exceeds workers' marginal revenue product, a competitive firm will

A) raise the price of the product.
B) lower the price of the product.
C) hire more labour.
D) hire less labour.

24) The demand for the services of labour

A) is not a derived demand but the demand for the services of land is.
B) is a derived demand but the demand for the services of land is not.
C) is a derived demand. So is the demand for the services of land.
D) is not a derived demand. Neither is the demand for the services of land.

25) The elasticity of demand for the services of labour will be greater

A) the greater the difficulty of substituting capital for labour.
B) the greater the elasticity of demand for the finished product.
C) the lower the marginal revenue productivity.
D) the shorter the period of training required in the industry.