David Ricardo 2: On Distribution

Introduction

Reminder

- David Ricardo (1772–1823)
- Self-taught British economist
- Involved in the economic debates of his time

  – Exemple : **Ricardo and the Corn Laws**

Introduction

The Corn Laws

- **Corn Acts** (1772-1846) = acts of Parliament regulating the trade of cereals with foreign countries

- **Corn Law Act of 1815**: a specific context
  - A Parliament dominated by landed interests.
  - Adopted after the end of the Napoleonic blockade (1804–1814).
  - Aimed to restrict imports
    $\Rightarrow$ imports banned when the price of corn fell below 80 shillings per quarter.
  - Benefited landowners by increasing land rents.

Introduction

Ricardo's Opposition to the Corn Laws

a. Corn Laws **push up the price of corn**

b. Higher food prices force capitalists to **raise wages**
   → so that workers can meet their basic needs

c. Higher wages **tend to reduce profits**

Consequences:
→ Lower capital accumulation and slower economic growth
→ Risk of a "**stationary state**"

Conclusion:
→ GB should rather **import corn** if it is more cheaply produced abroad
→ Ricardo supports international **free trade**

Introduction

Ricardo and the Corn Laws

- It is in this context that Ricardo presents his theory of value and distribution in his major work: *On the Principles of Political Economy and Taxatio*n (1817).

- After examining Ricardo's theory of value, we will now focus on **distribution**. Understanding these two points will help explain **Ricardo's opposition to the Corn Laws**.

The Ricardian theory of distribution

"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,"

(*Principles*, Preface)

The Ricardian theory of distribution

A distribution of the produce among 3 social classes

- Just like Smith, Ricardo sees the nation's **produce as being divided among three social classes**:
  - **Landowners**, who receive part of the produce as **rent**;
  - **Workers**, who receive part of the produce as **wages**;
  - **Capitalists**, who receive part of the produce as **profits**.

- We will now see how these different incomes are determined, according to Ricardo.

The Ricardian theory of distribution

Ricardo's opposition to Smith on distribution

- In Smith's framework, analyses of **value and distribution are connected**.

- "**Additive**" theory: the natural price of commodities is determined by the sum (or addition) of the incomes (w+π+r) spent to produce them.

- **Incomes** are a priori **independent**: a variation in one income seems to affect prices rather than the other incomes.

The Ricardian theory of distribution

Ricardo's opposition to Smith on distribution

- In Ricardo's framework, analyses of **value and distribution are dissociated**.

- "**Deductive**" theory in two steps:

1. **Value**: the natural price of commodities is determined by the **quantities of labour embodied in their production**.
   Incomes do not intervene at this stage, since only the amount of labour expended is considered, **regardless of how it is remunerated**.

2. **Distribution**: the elements of distribution — that is, the **incomes** of the social classes — are then **deduced from this ex-ante fixed value**.

- **Interdependent incomes**: a variation in one income logically **affects** one or more of the other incomes ("**sharing the pie**" principle).

The Ricardian theory of distribution

Recap

	Smith	Ricardo
Relation value / distribution	connected	dissociated
Method	additive	deductive
Determination of prices	sum of incomes	quantities of labour embodied
Incomes	independent a priori	interdependent
Effect of a variation in one income	mainly affects prices	affects other incomes ("sharing the pie")

The Ricardian theory of distribution

Outline

1. The theory of differential rent: principle and illustration

2. The antagonism between wages and profits

3. The path toward the stationary state

The Ricardian theory of distribution

1. The theory of differential rent: principle and illustration

The Ricardian theory of distribution

- The **Ricardian definition of rent**:

  - Ricardo aims to provide **a precise definition of rent** to avoid what he sees as an error in Smith's approach.
  - According to him, Smith's definition — a right to use the land — is too vague and tends to **confuse rent with profits** on capital invested in agriculture.

- For Ricardo, it is essential not to confuse rent with profits, because: "the laws which regulate the progress of rent, are widely different from those which regulate the progress of profits, and **seldom operate in the same direction**."(*Principles*, chap. 2)

The Ricardian theory of distribution

- To illustrate his point, Ricardo considers the hypothetical example of **two farms of the "same extent and natural fertility"**.

- The only difference is that **Farm 1 has buildings and tools** facilitating cultivation, while **Farm 2 has only a raw plot**.

- Clearly, Ricardo says, **more remuneration would be paid for Farm 1** than that for Farm 2.

- However, **this extra income for Farm 1 is not rent but profit**: it compensates the provision of a capital (buildings and tools), **not the productive capacity of the land**.

The Ricardian theory of distribution

- Ricardo proposes the following **definition of rent**:

"Rent is that portion of the produce of the earth, which is paid to the landlord for the **use of the original and indestructible powers of the soil**." (*Principles*, Chap. 2)

$\Rightarrow$ **2 immediate implications**

The Ricardian theory of distribution

"Rent is that portion of the produce of the earth, which is paid to the landlord for the **use of the original and indestructible powers of the soil**." *(Principles, Chap. 2)*

$\Rightarrow$ **2 immediate implications**

1. **Rent exists only in agriculture** (apart from the special case of mines), the only sector where the productive powers of land are properly said exploited.

2. **Rent is relative**: since the productive powers of land are not uniform, **rent depends on land fertility**.
   The most fertile lands generate higher rent, while less fertile lands generate lower rent, for the same area cultivated.

The Ricardian theory of distribution

- The amount of rent paid for the use of a land thus depends on its fertility.

  A reference point: marginal lands

- The **least productive lands** in the economy — those with the highest unit production costs — **do not generate any rent**.

- These lands, called **marginal lands** because they are assumed to be the last to be cultivated, serve as a reference point to calculate the rents of other lands, based on the difference in production costs.

- This is why it is called the theory of **differential rent**.

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Differential Rent: A "Dynamic" Illustration

- **Step 1:** The nation is sparsely populated.

  Cultivating **part** of the first-grade land (L1) is sufficient to ensure subsistence.

  On this land, **an amount X of capital yields 100 quarters of corn**.

  No rent is paid in the economy, since some first-grade land remains available.

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Differential Rent: A "Dynamic" Illustration

- **Step 2:** population increases with the "progress" of society.

- **All** first-grade land (L1) must be cultivated, as well as **part of** second-grade land (L2), where the same **amount X of capital yields 90 quarters of corn**.

- **A rent of 10 quarters appears on first-grade land (L1)**, equal to the difference in production between this land and second-grade land (L2).

- Marginal land **(L2) pays no rent**.

- L1: 100 quarters of corn per year / rent = 100 – 90 = **10 quarters**
  L2: 90 quarters of corn per year / **no rent**

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Differential Rent: A "Dynamic" Illustration

- **Step 3:** population increases further.

- **All** first- and second-grade land (L1 and L2) must be cultivated, as well as **part of** third-grade land (L3), where the same **amount X of capital produces 80 quarters of corn**.

- A rent of **10 quarters appears on (L2)**, and rents on **(L1) rise to 20 quarters** - for the same amount X of capital.

- Marginal land, now **(L3), pays no rent**.

- **L1:** 100 quarters of corn per year / rent = 100 – 80 = **20 quarters**
  L2: 90 quarters of corn per year / rent = 100 – 90 = **10 quarters**
  L3: 80 quarters of corn per year / **no rent**

"Dynamic" Illustration (Rents in Kind):
Land is brought into cultivation as the population grows.

Step 1: one quality of land cultivated
- **L1 : produces 100 quarters of corn for X capital invested / no rent**

Step 2: two qualities of land cultivated
- L1 : produces 100 quarters of corn for X capital invested / rent 10 (100 - 90)
- L2 : produces 90 quarters of corn for X capital invested / no rent

Step 3: three qualities of land cultivated
- *L1 :* produces 100 quarters of corn for X capital invested / rent 20 (100 - 80)
- *L2 :* produces 90 quarters of corn for X capital invested / rent 10 (90 - 80)
- *L3 :* produces 80 quarters of corn for X capital invested / no rent

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- Rent is therefore a **consequence of the worsening conditions of agricultural production** and increases with the progress of society.

- **Differential rents ensure a unique profit rate**: at step 3, each amount X of capital invested yields 80 quarters of corn, regardless of land quality.

- However, **rent does not affect the price of corn**.

- The **natural price** of corn is determined by the **labour embodied in its production on marginal land** (the least favourable conditions of production).

- This **natural price of corn prevail for all producers** (assuming corn of uniform quality).

"Static" Illustration (Rents in Value)
Suppose that at time t, three qualities of land are cultivated:

- On L1, 8 hours of labor are required to produce one quarter of corn.

- On L2, 9 hours of labor are required to produce one quarter of corn.

- On L3, 10 hours of labor are required to produce one quarter of corn.

The natural price of corn, <u>unique in the economy</u>, is determined by the production costs on the least fertile land
(1 quarter of corn worth 10 hours of labour).

- On L1, a quarter whose production costs 8 hours is sold at the equivalent of 10 hours of labor → 2 hours of rent per quarter.

- On L2, a quarter whose production costs 9 hours is sold at the equivalent of 10 hours of labor → 1 hours of rent per quarter.

- On L3, a quarter whose production costs 10 hours is sold at the equivalent of 10 hours of labor → no rent.

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Differential rent - Summary in 3 Key Points

1. No rent is ever paid on the least fertile land – i.e., the last category of land brought into cultivation, or marginal land.

2. The natural price of corn (and agricultural products in general), unique in the economy, is determined by production costs on marginal land.

3a. Rent (in value) for any land equals the difference between the sale price at the natural price and the actual production costs.

Or, following Ricardo's "dynamic" example,

3b. Rent (in kind) for any land equals the difference between its produce and that of marginal land for equal amounts of capital invested.

The Ricardian theory of distribution

- The fundamental assumption underlying Ricardo's reasoning is that **each additional unit of capital employed in agriculture yields less produce than the previous one**.

  → **Diminishing marginal productivity of capital and labour** (in the agricultural sector).
  Sometimes called "**law of diminishing returns**" (⚠ distinct from "decreasing returns to scale")

- Otherwise, capitalists would prefer to increase investment on already cultivated land rather than bring less fertile marginal land into cultivation.

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- Indeed:

"It often, and, indeed, commonly happens, that before No. 2, 3, 4, or 5, or the inferior lands are cultivated, capital can be employed more productively on those lands which are already in cultivation. It may perhaps be found, that by doubling the original capital employed on No. 1, though the produce will not be doubled, will not be increased by 100 quarters, it may be increased by eighty-five quarters, and that this quantity exceeds what could be obtained by employing the same capital, on land No. 3. In such case, capital will be preferably employed on the old land, and will equally create a rent; **for rent is always the difference between the produce obtained by the employment of two equal quantities of capital and labour.** (…) If, then, good land existed in a quantity much more abundant than the production of food for an increasing population required, or **if capital could be indefinitely employed without a diminished return on the old land, there could be no rise of rent**; for rent invariably proceeds from the employment of an additional quantity of labour with a proportionally less return."(*Principles*, chap. 2)

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Land	Capital invested	Production	Rent	Commentary
L1 (best)	X	100	20 (100 – 80)	Rent from first amount X of capital
	2nd amount X	85	5 (185 – 160)	Rent from second amount X; declining marginal productivity
	2 X	185	25	Rent for two amounts X
L2 (intermediate)	X	90	10 (100-90)	Rent L2 compared to marginal land L3
L3 (marginal)	X	80	0	Reference land; no rent

The Ricardian theory of distribution

- Two types of rent should then be distinguished:
  - **Extensive rent** (resulting from the cultivation of increasingly less fertile land)
  - **Intensive rent** (resulting from additional investments on already cultivated land, with decreasing marginal productivity).

- In both cases, the rent mechanism tends toward the same outcome: **the equalization of the rate of profit in agriculture**.

- This equalization, like the convergence of market prices toward natural prices, **presupposes competition** among capitalists.

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Rent and the Price of Corn

- The worsening of agricultural conditions of production has **two simultaneous effects**:
  - An increase in the price of corn
  - A general rise in rents

- **CAUTION: these two effects are decorrelated**.
  The price of corn rises because it becomes more difficult to produce (more labour is required), not because rent increases.

- **Rent <u>is not</u> a determinant of the price of corn**.

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"**The reason then, why raw produce rises in comparative value, is because more labour is employed in the production of the last portion obtained, and not because a rent is paid to the landlord**. The value of corn is regulated by the quantity of labour bestowed on its production on that quality of land, or with that portion of capital, which pays no rent. **Corn is not high because a rent is paid, but a rent is paid because corn is high**; and it has been justly observed, that **no reduction would take place in the price of corn, although landlords should forego the whole of their rent**. Such a measure would only enable some farmers to live like gentlemen, but would not diminish the quantity of labour necessary to raise raw produce on the least productive land in cultivation."(Principles, chap. 2)

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- Rent is not a determinant of the price of corn.

- Moreover, **rent is nor a component of the prices, in any sector**:
  - in **industry**, since no rent is paid, prices consists solely in wages and profits
  - in **agriculture**, prices are determined on marginal lands. Since no rent is paid on these lands, **the natural price of agricultural produces also consist solely in wages and profits**.

- Conclusion: since **all prices** are determined by labour and **composed of wages and profits**, there is inverse relationship between these two components.
  $\Rightarrow$ **antagonism between wages and profit regarding distribution**.

The Ricardian theory of distribution

The "natural price of labour" (subsistence wage)

- "**Labour**, like all other things which are purchased and sold, and which may be increased or diminished in quantity, **has its natural and its market price**. 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 either increase or diminution**." (*Principles*, Chapter V)

- Application of the labour-value theory: the natural price of labour is determined by the labour embodied in its production—that is, **the labour required to produce the subsistence goods necessary for the reproduction of the worker and their family**.

- Among these subsistence goods, corn plays a key role: **the subsistence wage is indexed to the price of corn**.

The Ricardian theory of distribution

Market and natural prices of labour

- Like other commodities, labour has a market price, determined by supply (S_l) and demand (D_l).
  Labour supply, coming from workers, depends on population growth.

- The market wage (w) tends to converge towards the natural wage (w*).

- When capital accumulation is high
  $\Rightarrow$ labour demand rises ($D_l > S_l$)
  $\Rightarrow$ w > w*
  $\Rightarrow$ demographic growth (⬆ S_l) and return to equilibrium ($D_l = S_l$)

- When capital accumulation is low:
  $\Rightarrow$ labour demand falls
  $\Rightarrow$ w < w*
  $\Rightarrow$ demographic decline (⬇ S_l) and return to equilibrium ($D_l = S_l$)

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Market and natural prices of labour

- **The market wage (w) also tends to converge toward the natural wage (w*).**

- Note: Adjustment occurs **through demography**, not capital transfer.

- When equilibrium is restored, the **population size has changed**.

- **Key point**: **Capital accumulation (economic growth) stimulates demographic growth**.

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Profit as a Residual

- As the market price of labour converges towards its natural price, **only the natural subsistence wage (w*) will be considered from now on**.

- The natural wage is determined first, following a subsistence logic, and **profit is merely a residual**:

  → **What remains** from sales receipts after deducting all capitalist advances, **especially wage advances**.

- Consequence: a rise in the price of corn **increases wages and reduces profits** across all sectors.

The path toward the stationary state

Reasoning:

- Economic "progress" (capital accumulation) leads **population growth**.

- Population growth leads to an **increase in the production of agricultural goods**.

- Due to diminishing returns to capital and labour in agriculture, the **natural price of corn rises**.

- The increase in the natural price of corn fuels **a rise in natural wages**.

- Higher natural wages **reduce profits**, which are residual.

- In the long run, profits shrink until capital accumulation stops: the **stationary state**.

The path toward the stationary state

- **a)** Capital accumulation stimulates population growth

- **b)** Population growth leads to an expansion of corn production

- **c)** The natural price of corn rises as its production requires more labour

- **d)** Natural wages increase due to the rise in the natural price of corn

- **e)** The natural rate of profit in the economy falls due to the increase in natural wages

- **f)** As long as profits remains positive, capital accumulation continues → return to step **a)**

The path toward the stationary state

- In the long run, the rate of profit falls to a level that no longer allows accumulation, and **the cycle (a → g) comes to an end**.

- The economy "naturally" tends toward a **stationary state**, in which accumulation and population growth stop.

The path toward the stationary state

Solutions

- **Technical progress:** uncertain and cannot be relied upon as a systematic solution. It is **contingent** in nature and depends on innovations by the class of *"philosophers or men of speculation"* (see the chapter on Smith). It rests on the interdependence between the industrial and agricultural sectors.

- **Legislative action:** Ricardo favours the legislative route. The **repeal of the Corn Laws**, which restrict imports of foreign grain and artificially raise the price of English corn, appears to him to be more effective and to have an immediate impact.

Conclusion

Ricardo's Opposition to the Corn Laws

- The Corn Laws force the cultivation of increasingly less fertile land in order to meet population growth resulting from social progress. **They therefore push up the price of corn.**

- This accelerates the rise in wages and the fall in the rate of profit, which is the driving force behind capital accumulation: the **Corn Laws thus hasten the stationary state**.

- Ricardo supports free trade: corn should be **imported when cheaper abroad**.

- The Corn Laws were **repealed in 1846**, twenty-three years after Ricardo's death, following the campaign of the Anti-Corn Law League, led by Richard Cobden.

Conclusion

Ricardo vs. Smith on free trade

- Smith and Ricardo **both support free trade** in order to delay the fall in the rate of profit, **but for different reasons**:

  ✓ **Smith**:
  Free trade provides outlets for production.
  The division of labour and capital accumulation are **limited by the size of national markets**.

  ✓ **Ricardo**:
  Assuming Say's Law, free trade is not needed to absorb excess production.
  Instead, it allows countries to **benefit from comparative advantage** and, in the case of Great Britain, to **limit rising wages by importing cheaper grain**, thereby protecting profits.

Conclusion

Comparative Advantage

- In Chapter 7 of the Principles, Ricardo shows, using a simple example, that even **nations with no absolute advantage have a theoretical interest in international specialization**.

- Suppose that two countries, England and Portugal, produce only wine and cloth of homogeneous quality. Portugal has an absolute advantage—that is, higher labour productivity—over England in both industries.

Conclusion

Comparative Advantage

- Portugal has an absolute advantage over England in both industries: it takes 90 hours to produce a unit of cloth in Portugal compared with 100 hours in England, and 80 hours compared with 120 hours to produce a barrel of wine.

	Portugal	England
Cloth	90 hours	100 hours
Wine	80 hours	120 hours

- The production cost of a barrel of wine in Portugal therefore amounts to 66% of the English cost, while the cost of Portuguese cloth represents 90% of the cost in England

Conclusion

Comparative Advantage

	Portugal	England
Cloth	90 hours	100 hours
Wine	80 hours	120 hours

- Under autarky, England would need (100 + 120) 220 hours and Portugal (90 + 80) 170 hours to produce, each on their own, one unit of cloth and one barrel of wine: total of **390 hours to produce two units of each good**.

- If England **specialized** in cloth and Portugal in wine, England would need (2 × 100) 200 hours to produce two units of cloth, and Portugal (2 × 80) 160 hours to produce two barrels of wine.
  Total of **360 hours to produce two units of each good**, implying a **global gain of 30 hours** of labour.

Conclusion

Comparative Advantage

	Portugal	Angleterre
Drap	90 heures	100 heures
Vin	80 heures	120 heures

- If England specialized in cloth and Portugal in wine, England would need (2 × 100) 200 hours to produce two units of cloth, and Portugal (2 × 80) 160 hours to produce two barrels of wine. Total of **360 hours to produce two units of each good**, implying a **global gain of 30 hours** of labour.

- Ricardo thus shows, against mercantilist doctrines, that trade between nations can be a **positive-sum game**, from which all parties can benefit.