

#### **Equity and the Distribution of Income**

In a pair or small group...

Discuss the difference between equality and equity



Or less inequality relative to what would be achieved in the free market

## **Distribution of Income and Wealth**



Is wealth and income connected?

Is it necessarily the case that an individual with high disposable income will also be wealthy?

Are all low income earners always going to be poor?

What are some exceptions?





#### Starter

- Video: Global Wealth Inequality What you never knew you never knew
- 1. Discuss how wealth is distributed around the globe.
- 2. What are possible reasons for wealth inequality?

### **Distribution of Income and Wealth**

One of the characteristics with **free market economies** is an <u>unequal distribution of income and wealth</u>.

#### This may be due to several factors:

- Discrimination
- Education
- Family background
- Unequal distribution of factors of production
- External factors

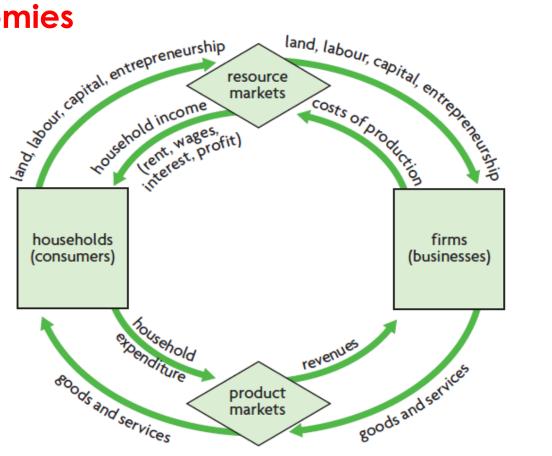


#### Distribution of Income and Wealth

One of the characteristics with **free market economies** is an unequal distribution of income and wealth.

#### This may be due to several factors:

- Discrimination
- Education
- Family background
- Unequal distribution of factors of production
- External factors



#### Distribution of Income and Wealth

Market-determined distribution of income in an economy is likely to be very unequal.

Markets *cannot* ensure that everyone will secure enough income to satisfy their basic needs.

Governments use a <u>variety of methods</u> to change the market-determined distribution of income and output, and arrive at a more <u>socially desirable outcome</u>.

This is known as **redistribution**.

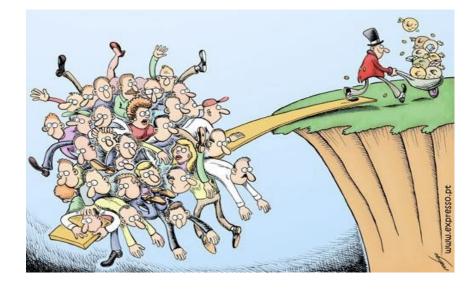


## **Indicators of Income Inequality**

#### How do we measure income inequality?

	Percentage Share of Total Income				
Country	Poorest 20%	Second 20%	Third 20%	Fourth 20%	Richest 20%
Ghana (2006)	5.2	9.8	14.8	21.9	48.3
Mexico (2006)	3.8	8.1	12.4	19.3	56.4
Pakistan (2005)	9.1	12.8	16.3	21.3	40.5
Philippines (2006)	5.6	9.1	13.7	21.2	50.4

Source: The World Bank, World Development Indicators, <a href="http://data.worldbank.org/data-catalog">http://data.worldbank.org/data-catalog</a>



**Quintiles** of the population

A **quintile** is a 20% of a country's population.

**Equal income distribution** would have every quintile

receiving 20% of income

#### **Indicators of Income Inequality**



# Which economy in the table has the...

#### How do we measure income inequality?

**Percentage Share of Total Income** Richest Difference Country **Poorest** Fourth 20% 20% 20% 20% 20% Ghana 5.2 9.8 21.9 48.3 43.1 14.8 (2006)Mexico 3.8 8.1 12.4 19.3 56.4 52.6 (2006)Pakistan 9.1 12.8 16.3 21.3 40.5 31.4 (2005)Philippines 5.6 9.1 13.7 21.2 50.4 44.8 (2006)

Highest and the lowest level of income inequality?

In general, the greater the difference between the poorest and the richest quintile, the more unequal the distribution of income

**Highest:** Mexico

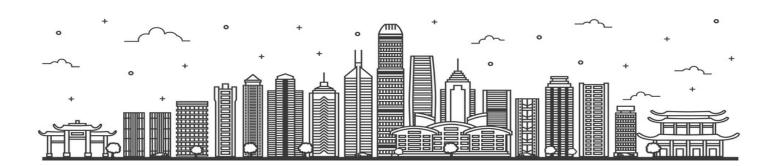
**Lowest:** Pakistan

Source: The World Bank, World Development Indicators, <a href="http://data.worldbank.org/data-catalog">http://data.worldbank.org/data-catalog</a>

## **Indicators of Income Inequality**

#### How do we measure income inequality?

A decile is 10% portions of the country's population.



# Percentage share of total income by deciles in Hong Kong

	2001	2006	2011
Poorest 10%	0.9	0.8	0.6
Second 10%	2.3	2.1	2.0
Third 10%	3.4	3.2	3.1
Fourth 10%	4.5	4.3	4.3
Fifth 10%	5.6	5.5	5.5
Sixth 10%	7.0	7.0	7.0
Seventh 10%	8.8	8.8	8.9
Eighth 10%	11.1	11.3	11.5
Ninth 10%	15.3	15.6	16.1
Richest 10%	41.1	41.4	41.0

Source: Hong Kong Census and Statistics Department, 2011 Population Census, <a href="https://www.census2011.gov.hk/pdf/household-income.pdf">www.census2011.gov.hk/pdf/household-income.pdf</a>

Percentage share of total income by deciles in Hong Kong

Cumulative percentage share of total income in Hong Kong

	2001	2006	2011
Poorest 10%	0.9	0.8	0.6
Second 10%	2.3	2.1	2.0
Third 10%	3.4	3.2	3.1
Fourth 10%	4.5	4.3	4.3
Fifth 10%	5.6	5.5	5.5
Sixth 10%	7.0	7.0	7.0
Seventh 10%	8.8	8.8	8.9
Eighth 10%	11.1	11.3	11.5
Ninth 10%	15.3	15.6	16.1
Richest 10%	41.1	41.4	41.0

	2001	2006	2011
0-10%	0.9	0.8	0.6
0-20%	3.2	2.9	2.6
0-30%	6.6	6.1	5.7
0-40%	11.1	10.4	10
0-50%	16.7	15.9	15.5
0-60%	23.7	22.9	22.5
0-70%	32.5	31.7	31.4
0-80%	43.6	43	42.9
0-90%	58.9	58.6	59
0-100%	100	100	100

Source: Hong Kong Census and Statistics Department, 2011 Population Census, www.census2011.gov.hk/pdf/household-income.pdf

Source: Hong Kong Census and Statistics Department, 2011 Population Census, www.census2011.gov.hk/pdf/household-income.pdf

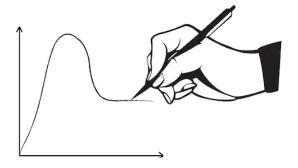
## **Indicators of Income Inequality**

#### How do we measure income inequality?

A decile is 10% portions of the country's population.

This allows us to further analyse the issue of income inequality in Hong Kong.

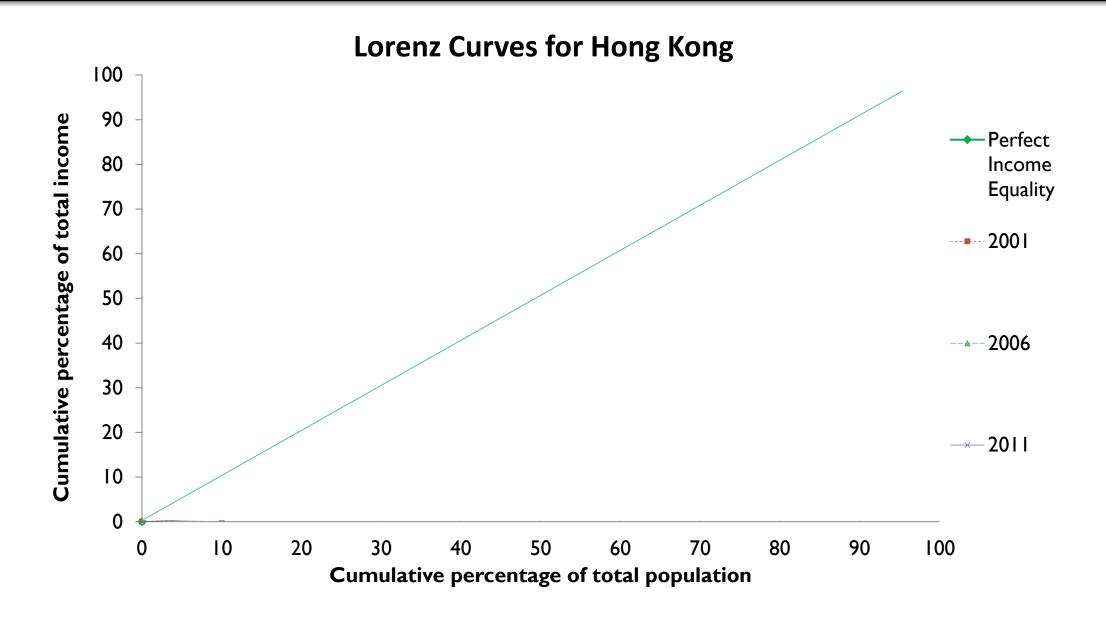
## Let's plot the data onto a graph

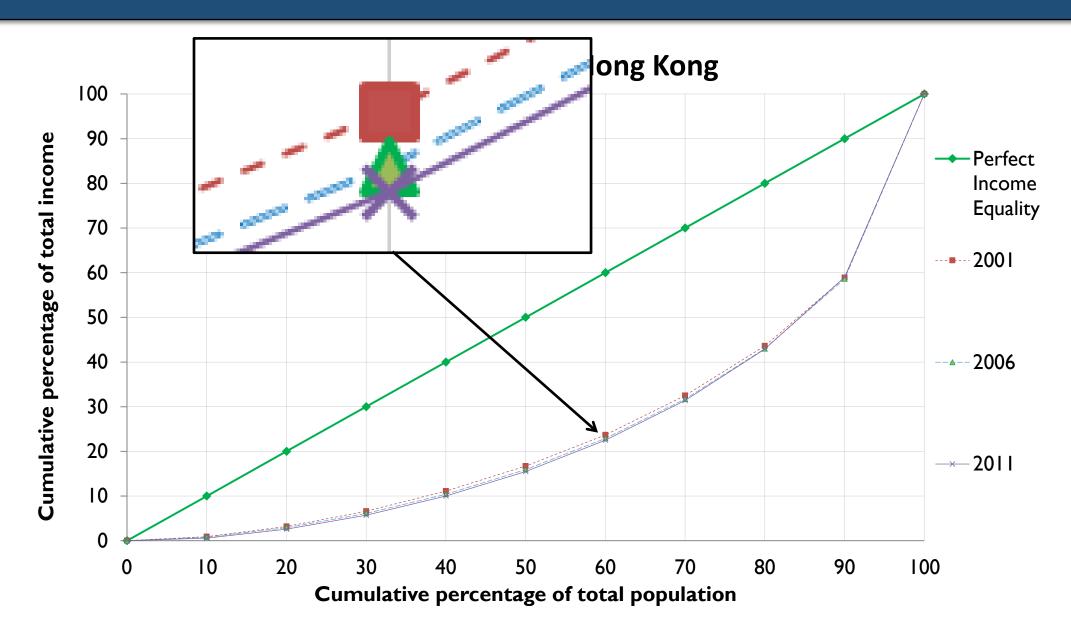


# Cumulative percentage share of total income in Hong Kong

	2001	2006	2011
0-10%	0.9	0.8	0.6
0-20%	3.2	2.9	2.6
0-30%	6.6	6.1	5.7
0-40%	11.1	10.4	10
0-50%	16.7	15.9	15.5
0-60%	23.7	22.9	22.5
0-70%	32.5	31.7	31.4
0-80%	43.6	43	42.9
0-90%	58.9	58.6	59
0-100%	100	100	100

Source: Hong Kong Census and Statistics Department, 2011 Population Census, <a href="https://www.census2011.gov.hk/pdf/household-income.pdf">www.census2011.gov.hk/pdf/household-income.pdf</a>





## **Indicators of Income Inequality**

#### **Lorenz Curve**

The Lorenz Curve shows the degree of income inequality in an economy.

To plot a Lorenz Curve, income distribution figures that divide the population into ten deciles or any other convenient subdivision could be used.

The closer a country's Lorenz Curve is to the line of perfect income equality, the more equal is the distribution of income and vice versa.

## **Drawing a Lorenz Curve Diagram**

#### Instructions

- Construct a table showing the cumulative percentage of total income relative to the cumulative percentage of total population
- 2. Draw the horizontal axis using increments of 10% (deciles) or 20% (quintiles) and label this axis as Cumulative percentage of total population
- 3. Draw the vertical axis using increments of 10% (deciles) or 20% (quintiles) and label this axis as Cumulative percentage of total income



## **Drawing a Lorenz Curve Diagram**

#### Instructions

- 4. Plot the points of cumulative percentage of income for each decile or quintile by using the data from the table constructed in Step 1
- **5. Draw the diagonal line** representing perfect income equality
- **6.** Label your curves and give the diagram a title



## **Indicators of Income Inequality**



	Percentage Share of Income				
Country	Poorest 20%	Second 20%	Third 20%	Fourth 20%	Richest 20%
Bolivia (2007)	2.7	6.5	11.0	18.6	61.2
Brazil (2007)	3.0	6.9	11.8	19.6	58.7
Croatia (2005)	8.8	13.3	17.3	22.7	37.9
Madagascar (2005)	6.2	9.6	13.1	17.7	53.4

- Draw the Lorenz
  Curves for the countries in the table
- Using your diagram, rank the four countries from most unequal income distribution to least unequal.

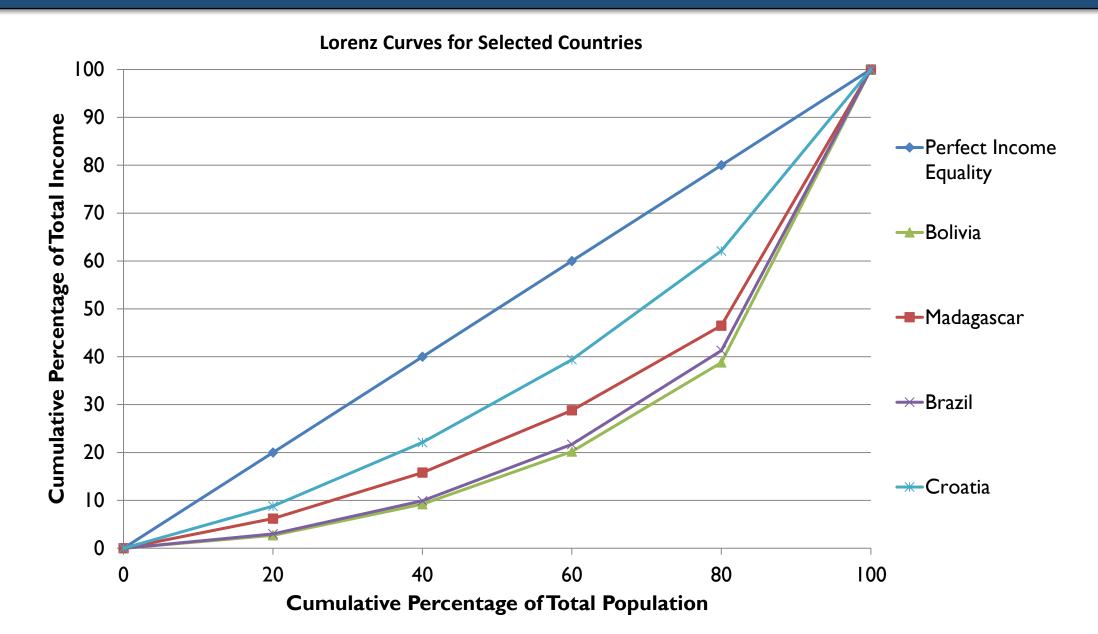
Source: The World Bank, World Development Indicators, http://data.worldbank.org/data-catalog

### **Indicators of Income Inequality**



			Cumulative	Percentage Share o	of Income	
	Cumulative % share of Total Population	0-20%	0-40%	0-60%	0-80%	0-100%
try	Bolivia (2007)	2.7	9.2	20.2	38.8	100
.uno	Brazil (2007)	3.0	9.9	21.7	41.3	100
C	Croatia (2005)	8.8	22.1	39.4	62.1	100
	Madagascar (2005)	6.2	15.8	28.9	46.6	100

Source: The World Bank, World Development Indicators, <a href="http://data.worldbank.org/data-catalog">http://data.worldbank.org/data-catalog</a>



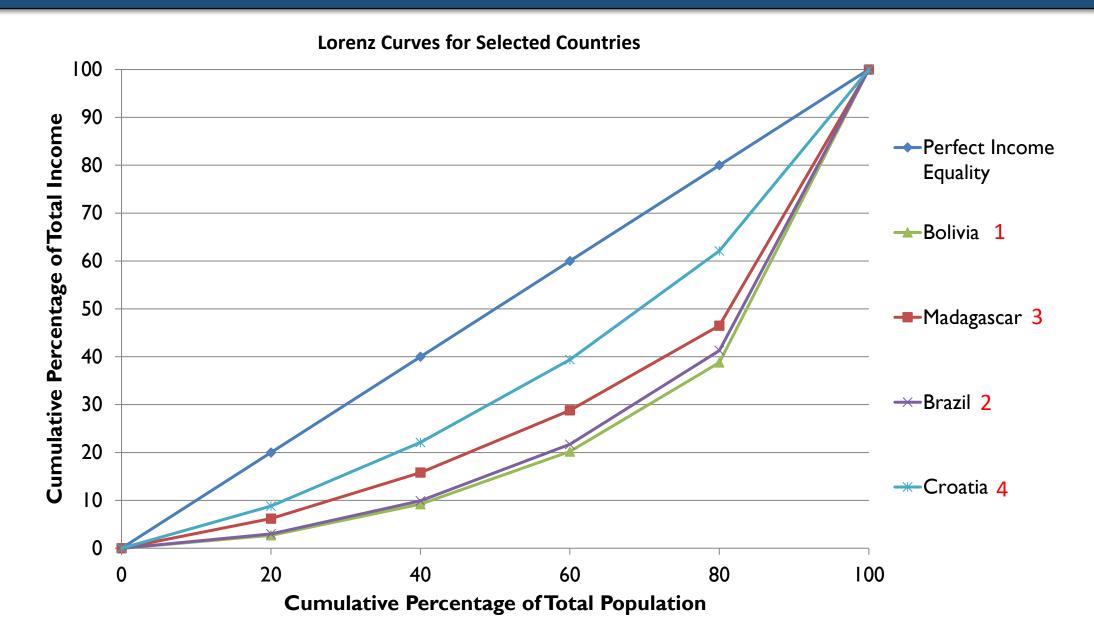
### **Indicators of Income Inequality**



	Percentage Share of Income				
Country	Poorest 20%	Second 20%	Third 20%	Fourth 20%	Richest 20%
Bolivia (2007)	2.7	6.5	11.0	18.6	61.2
Brazil (2007)	3.0	6.9	11.8	19.6	58.7
Croatia (2005)	8.8	13.3	17.3	22.7	37.9
Madagascar (2005)	6.2	9.6	13.1	17.7	53.4

- Draw the Lorenz
  Curves for the countries in the table
- 2. Using your diagram, rank the four countries from most unequal income distribution to least unequal.

Source: The World Bank, World Development Indicators, http://data.worldbank.org/data-catalog



## **Indicators of Income Inequality**

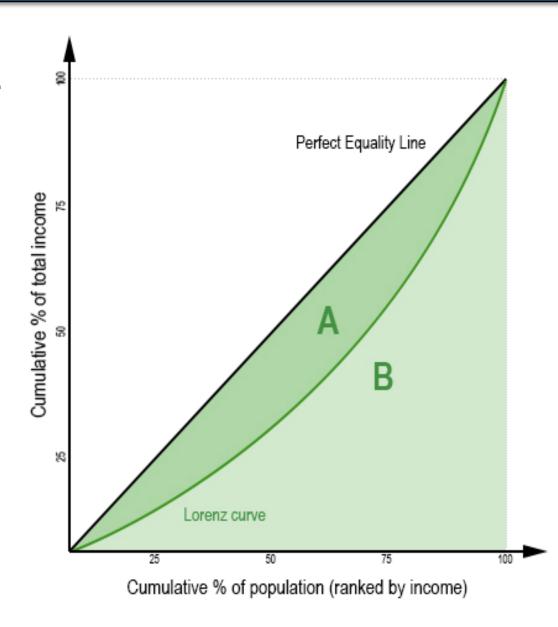
#### **Gini Coefficient**

The **Gini Coeficient** is a summary measure of the information contained in the **Lorenz Curve** of an economy.

Gini coefficient

= area between diagonal and Lorenz curve entire area under diagonal

Alternatively = 
$$\frac{A}{A + B}$$

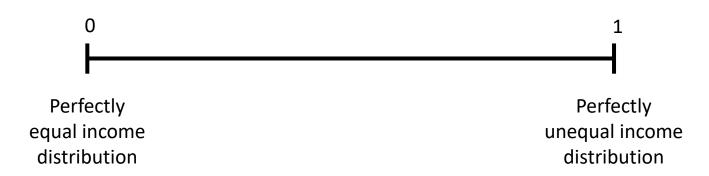


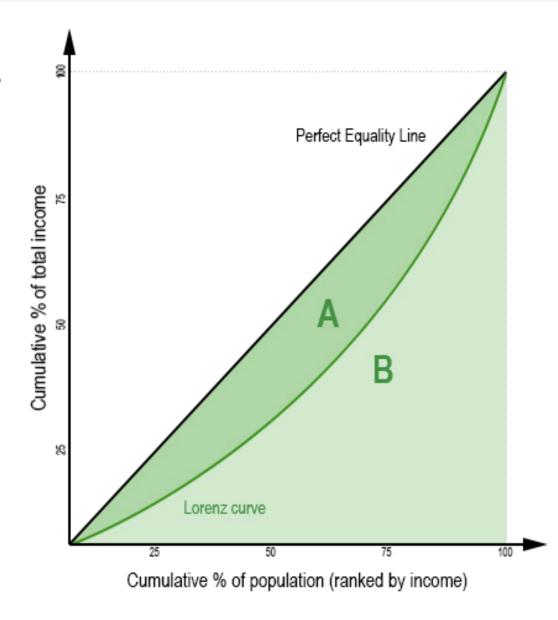
## **Indicators of Income Inequality**

#### **Gini Coefficient**

The **Gini Coeficient** is a summary measure of the information contained in the **Lorenz Curve** of an economy.

It has a value between 0 and 1.





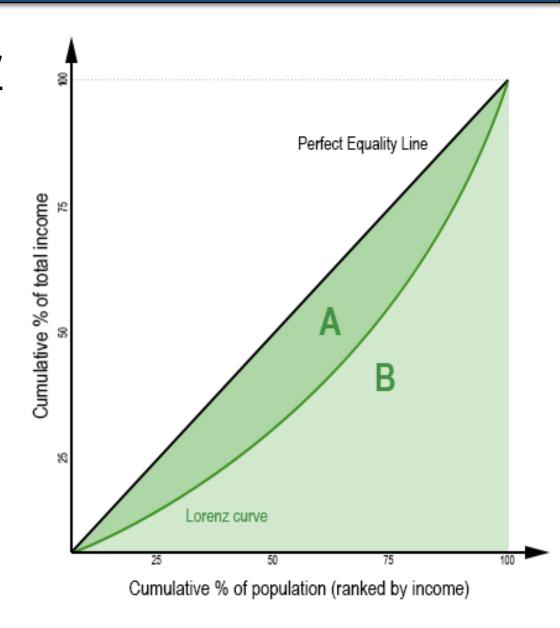
### **Indicators of Income Inequality**

#### **Gini Coefficient**

The **Gini Coeficient** is a summary measure of the information contained in the **Lorenz Curve** of an economy.

Redistribution of income will cause the Lorenz Curve to shift towards the diagonal.

The degree of income equality increases in the economy and is achieved by government policies

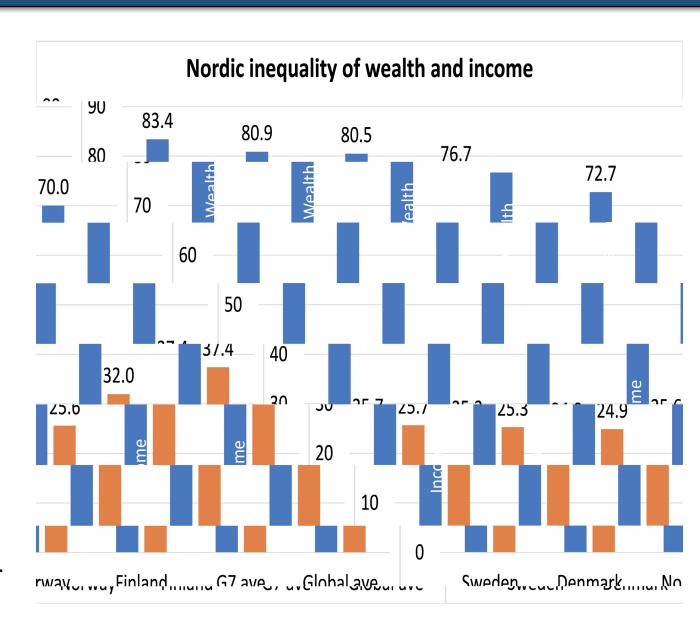


### **Wealth Inequality**

The three methods to measure income inequality can also be used to show the extent of wealth inequality.

# Distribution of wealth is generally far more unequal due to:

- Limited growth in wages
- High-income people have greater possibilities of accumulating savings
- Income and wealth feed on each other



### **Poverty**

**Poverty** refers to an inability to satisfy minimal consumption needs.

#### There are two types of poverty:

- Absolute poverty
- Relative poverty



#### **Poverty**

**Poverty** refers to an inability to satisfy minimal consumption needs.

#### There are two types of poverty:

#### Absolute poverty

It is the <u>inability to afford a basic standard of</u> goods and services, where the standard is absolute across countries.



## **Poverty**

**Poverty** refers to an inability to satisfy minimal consumption needs.

#### There are two types of poverty:

Absolute poverty

World Bank defines it:

**Extreme poverty** < US\$1.90

**Moderate poverty** < US\$2.60



#### Relative Poverty

**Relative poverty** is a concept that compares the income of individuals or households in a society with median incomes.

The more unequal the distribution of income, the greater is the degree of relative poverty.

People are considered poor if they cannot afford goods and services and a lifestyle that are typical in a society.

Country	% of population living below 50% of median income (2017 or latest available)
Germany	10.4
United Kingdom	11.1
Australia	12.1
Canada	12.4
Greece	14.4
Latvia	16.9
United States	17.8

#### **Relative Poverty**

**Relative poverty** is a concept that compares the income of individuals or households in a society with median incomes.

The measurement of what is typical is based on a particular percentage of society's **median** income (often 50%).

As incomes increase and the median income rises, the standard also rises.

Poverty rates differ widely among social groups.

Country	% of population living below 50% of median income (2017 or latest available)
Germany	10.4
United Kingdom	11.1
Australia	12.1
Canada	12.4
Greece	14.4
Latvia	16.9
United States	17.8

#### Minimum Income Standards

Minimum income standards (MIS) refer to a method to measure poverty which consists of what people in a population believe are the essentials for a minimum acceptable standard of living that allows people to participate in society.

- The MIS produces a budget for a basket of goods required by households in order to achieve the minimum standard of living.
- The minimum income for different family types is then calculated.
- Information can be helpful to government as a guide to making policies.

## **Multidimensional Poverty Index**

The multidimensional poverty index (MPI) was developed in 2010 by the UN Development Programme and the Oxford Poverty and Human Development Initiative.

# It measures poverty in three dimensions:

- Health
- Education
- Standards of living

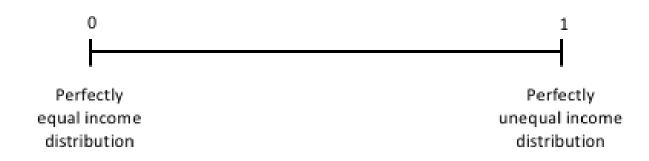
- Health is measured by
  - child mortality
  - nutrition
- Education is measured by
  - years of schooling
  - school attendance

- Living standards are measured by
  - cooking fuel
  - sanitation
  - drinking water
  - electricity
  - housing
  - assets

### **Multidimensional Poverty Index**

The multidimensional poverty index (MPI) was developed in 2010 by the UN Development Programme and the Oxford Poverty and Human Development Initiative.

To be counted as poor, people must be deprived in at least one-third of the indicators.



Developing region	MPI	Number of poor people (millions)	% of poor in total population*
Eastern Europe and Central Asia	0.009	3.5	2.4%
East Asia and the Pacific	0.025	117.7	5.9%
Latin America and the Caribbean	0.033	30.7	7.7%
Arab States	0.098	65.7	19.2%
South Asia	0.143	545.9	31.3%
Sub-Saharan Africa	0.317	559.4	57.7%
Global MPI Developing regions	0.115	1.33 billion	23.2%

## **Multidimensional Poverty Index**

The World Bank is in the process of developing another MPI to capture other important aspects of well-being that was not reflected.

Income per capita	Electricity
Child school enrolment	Coverage of key health services
Adult school attainment	Malnourishment (child and adult)
Limited-standard drinking water	Incidence of crime
Limited-standard sanitation	Incidence of natural disaster

Developing region	MPI	Number of poor people (millions)	% of poor in total population*
Eastern Europe and Central Asia	0.009	3.5	2.4%
East Asia and the Pacific	0.025	117.7	5.9%
Latin America and the Caribbean	0.033	30.7	7.7%
Arab States	0.098	65.7	19.2%
South Asia	0.143	545.9	31.3%
Sub-Saharan Africa	0.317	559.4	57.7%
Global MPI Developing regions	0.115	1.33 billion	23.2%

### **Difficulties in Measuring Poverty**

Poverty has different meanings and different approaches to measurements.

#### Measurement problems

- Income measures of poverty do not take into account of wealth/savings
- Measured by the use of household surveys
- National poverty lines often exclude the poor in urban areas as cost of living tends to be higher than rural areas.
- Information is not provided on <u>how much</u> people fall below the poverty line.

## **Difficulties in Measuring Poverty**

#### Overestimation or underestimation

Depending on particular goals of governments, the national poverty line may be overestimated or underestimated:

- Overestimation occurs if the government is trying to argue in favour of <u>receiving more foreign aid or multilateral assistance</u>.
- Underestimation occurs if the government wants to spend less on poverty reduction and more on other activities.

## **Causes of Poverty**

- Low incomes
- Unemployment
- Low levels of human capital
- Low levels of capital or land ownership
- Discrimination
- Geography



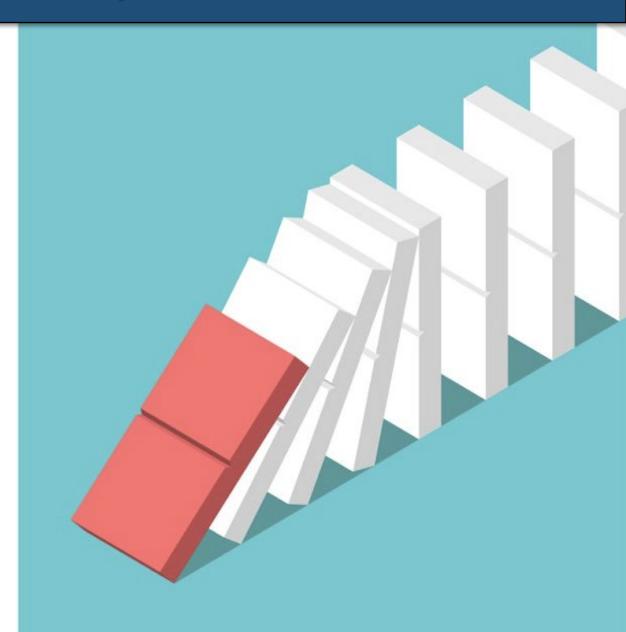
# **Causes of Poverty**

- Unequal status and power
- Government tax and benefit policies
- Technological change
- Globalisation
- Market-based supply side policies
- High abnormal profits of firms with increasing market power



## **Consequences of Poverty**

- Low living standards
- Low economic growth
- Lack of access to health care and education
- Higher infant, child and maternal mortality
- Higher levels of preventable diseases
- Social and political instability
- Inability to realise one's full potential



## **Methods to Promote Equity**

#### **Transfer Payments**

**Transfer payments** are payments made by the governments to individuals specifically for the purpose of redistributing income away from certain groups and towards other groups.

They transfer income from those who work and pay taxes towards those who cannot work and need assistance:

Older people

Children of poor families

Sick people

- Unemployed people and others
- Very poor people



## **Methods to Promote Equity**

#### **Government Provision of Merit Goods**

**Education**, healthcare and infrastructure would be under consumed due to low incomes and poverty.

Government may offer these <u>services free</u> (or nearly free) <u>of charge to consumers</u>.

Subsidies may also be provided to to private providers to increase supply in the market.

Corrects market failure by providing goods with positive consumption externalities



## **Methods to Promote Equity**

#### **Government Intervention in Markets**

- Minimum wage legislation
- Food price ceilings
- Price floors for farmers
- Policies to reduce discrimination

Potential drawback: Leads to allocative inefficiency and loss of social surplus

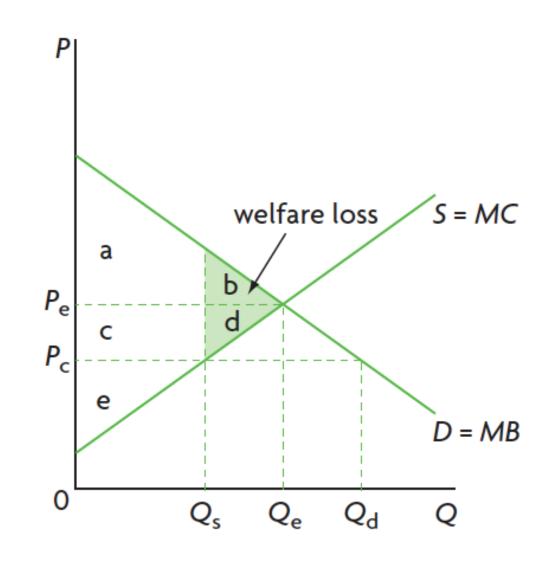


## **Methods to Promote Equity**

#### Government Intervention in Markets

- Minimum wage legislation
- Food price ceilings
- Price floors for farmers
- Policies to reduce discrimination

Potential drawback: Leads to allocative inefficiency and loss of social surplus



## **Methods to Promote Equity**

#### **Direct Taxes**

**Direct taxes** are taxes paid directly to the government tax authorities by the taxpayer.

#### The most important kinds includes:

- Personal income taxes
- Corporate incomes
- Wealth taxes property and inheritance tax



## **Methods to Promote Equity**

#### **Indirect Taxes**

**Indirect taxes** are taxes on spending on goods and services.

#### The most important kinds includes:

- Sales taxes
- Excise taxes
- Customs duties (tariffs)



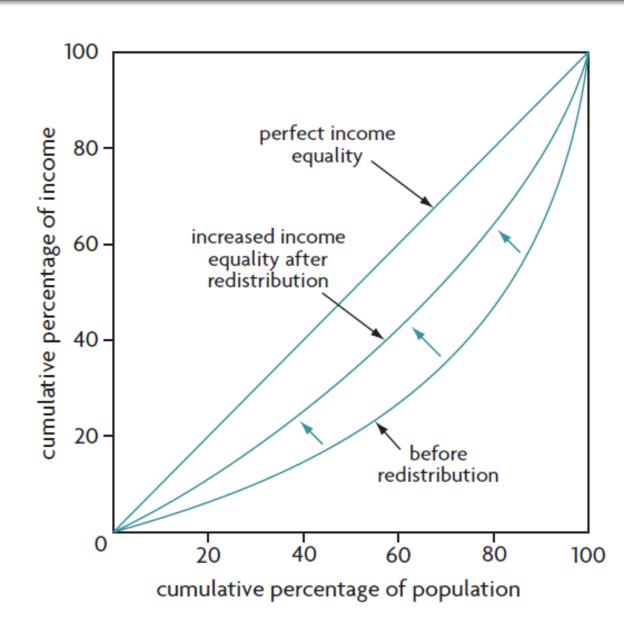
## **Methods to Promote Equity**

#### **Indirect Taxes**

**Indirect taxes** are taxes on spending on goods and services.

#### The most important kinds includes:

- Sales taxes
- Excise taxes
- Customs duties (tariffs)



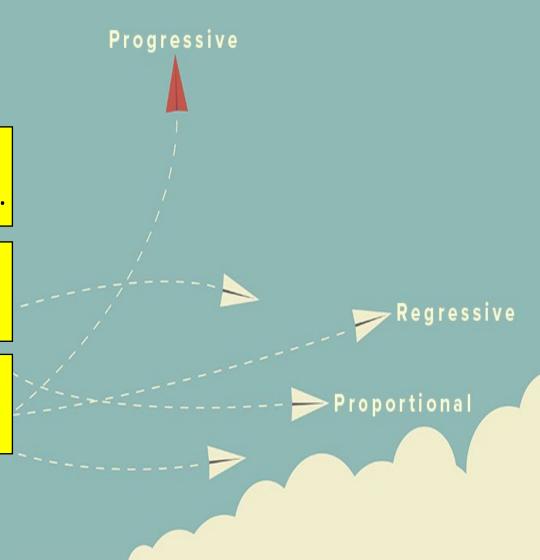
# **Methods to Promote Equity**

#### Taxes

**Proportional taxation** is when income increases, the fraction of income paid as taxes remains constant.

**Progressive taxation** is when income increases, the fraction of income paid as taxes increase.

**Regressive taxation** is when income increases, the fraction of income paid as taxes decreases.



Progressive Tax	Proportional Tax	Regressive Tax
Tax that takes a <b>lower</b> percentage of income/ wealth of the poor	Tax that takes the <b>same</b> percentage of income/wealth of all taxpayers	Tax that takes a <b>larger</b> percentage of the income/ wealth of the poor

Income (\$)	Tax Rate (%)	Tax Paid (\$)
100	10	10
500	20	100
1000	40	400

Progressive Tax	Proportional Tax	Regressive Tax
Tax that takes a <b>lower</b>	Tax that takes the <b>same</b>	Tax that takes a larger
percentage of income/	percentage of income/	percentage of the income/
wealth of the poor	wealth of all taxpayers	wealth of the poor

Income (\$)	Tax Rate (%)	Tax Paid (\$)
100	10	10
500	20	100
1000	40	400

Progressive Tax	Proportional Tax	Regressive Tax
Tax that takes a <b>lower</b> percentage of income/ wealth of the poor	Tax that takes the <b>same</b> percentage of income/wealth of all taxpayers	Tax that takes a <b>larger</b> percentage of the income/ wealth of the poor

Income (\$)	Tax Rate (%)	Tax Paid (\$)
100	25	25
500	25	125
1000	25	250

Progressive Tax	Proportional Tax	Regressive Tax
Tax that takes a lower	Tax that takes the <b>same</b>	Tax that takes a larger
percentage of income/	percentage of income/	percentage of the income/
wealth of the poor	wealth of all taxpayers	wealth of the poor

Income (\$)	Tax Rate (%)	Tax Paid (\$)
100	25	25
500	25	125
1000	25	250

Progressive Tax	Proportional Tax	Regressive Tax
Tax that takes a <b>lower</b> percentage of income/ wealth of the poor	Tax that takes the <b>same</b> percentage of income/wealth of all taxpayers	Tax that takes a <b>larger</b> percentage of the income/ wealth of the poor

Income (\$)	Tax Rate (%)	Tax Paid (\$)
100	40	40
500	30	150
1000	20	200

Progressive Tax		Regressive Tax
Tax that takes a <b>lower</b> percentage of income/	Tax that takes the <b>same</b> percentage of income/	Tax that takes a <b>larger</b> percentage of the income/
wealth of the poor	wealth of all taxpayers	wealth of the poor

Income (\$)	Tax Rate (%)	Tax Paid (\$)
100	40	40
500	30	150
1000	20	200

## **Principles of Taxation**



The following table illustrates income tax and sales tax rates for a number of nations:

Country	Income tax rate (average wage earners)	Tax rate (high earners)	Sales tax
Belgium	42.80%	40.40%	21%
Germany	39.90%	39.90%	17.5%
UK	24.90%	43.72%	8 - 20%
USA	22.70%	40.55%	6 - 12%
Mexico	9.5%	29.40%	16%
Saudi Arabia	0%	3.14%	5%

- a) Explain why there might be significant variations between income and sales tax rates between different countries?
- b) What are the advantages and disadvantages of governments collecting tax revenue from sales tax rather than income tax?

Think in terms of high and low income earners.

## **Principles of Taxation**

#### Calculating total income taxes

Marginal tax rate is defined as the tax rate paid on additional income, expressed as a percentage.

Average tax rate is tax paid divided by total income, expressed as a percentage.

Income taxes in a **progressive tax system** are calculated using *successive layers of income* and applying a different tax rate to each layer.



## Principles of Taxation



#### Calculating total income taxes and average tax rates

Net Chargeable Income (in HKD currency)	Rate
0- 50,000 HKD	2%
50,001- 100,000 HKD	6%
100,001– 150,000 HKD	10%
150,001– 200,000 HKD	14%
Above 200,001 HKD	17%
Net total income (no allowances)	Standard rate 15%

#### Calculate the income tax paid on the following annual incomes:

- a) \$32,000
- b) \$148,000
- c) \$250,000

What is the average tax rate for the incomes shown above?

$$Average\ tax\ rate = \frac{Total\ Tax}{Income} \times 100$$

## 



#### Indirect tax calculations

Suppose a family with an annual income of 60,000 pays income taxes of \$15,000 and they spend all its disposable income (\$45,000) on goods and services.

There is an indirect tax of 12.5%.

indirect tax = 
$$\frac{r}{100} \times \frac{S}{1 + \frac{r}{100}}$$

#### How much indirect tax did this family pay?

Indirect tax = 
$$0.125 \times (45,000/1.125)$$
  
= \$5,000

#### Now, calculate the following:

Average rate of indirect tax paid

Average rate of indirect tax = 
$$5,000 / 60,000$$
 =  $8.33\%$ 

## 



#### Indirect tax calculations

Suppose a family with an annual income of 60,000 pays income taxes of \$15,000 and they spend all its disposable income (\$45,000) on goods and services.

There is an indirect tax of 12.5%.

indirect tax = 
$$\frac{r}{100} \times \frac{S}{1 + \frac{r}{100}}$$

#### How much indirect tax did this family pay?

Indirect tax = 
$$0.125 \times (45,000/1.125)$$
  
= \$5,000

#### Now, calculate the following:

What is the total average tax paid?

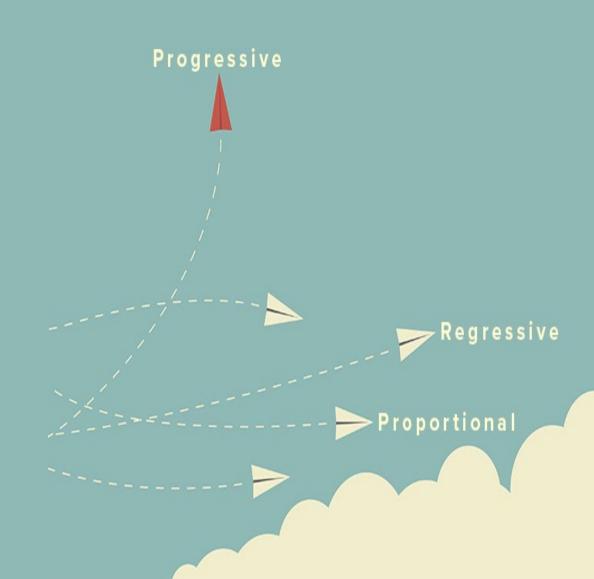
Total average tax paid = 
$$(15,000 + 5,000)$$
  
60,000

## **Methods to Promote Equity**

#### **Evaluation**

The more progressive a tax system, the more equal is the after-tax distribution of income.

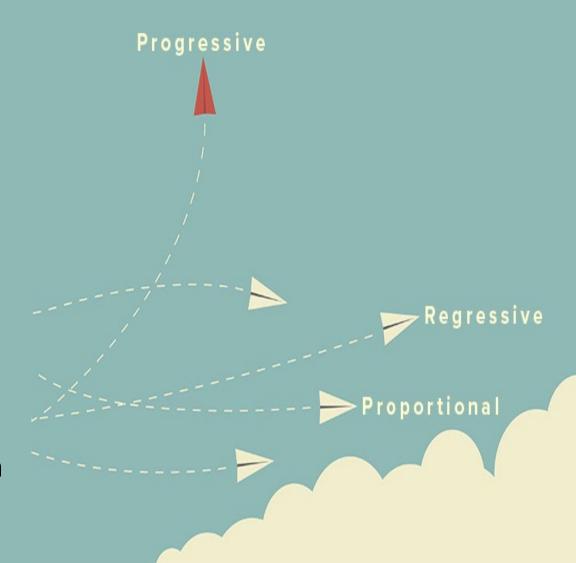
The more regressive a tax system, the more unequal is the after-tax distribution of income.



# **Methods to Promote Equity**

#### **Evaluation: Supporting Arguments**

- Empirical evidence suggests little effect from taxes on labour supplied, saving and investment
- Progressive taxes reduce short-term fluctuations in business cycle
- Greater income equality raises people out of poverty and increases their opportunities to find employment and contribute to economic growth



# **Methods to Promote Equity**

#### **Evaluation: Counter Arguments**

- High income taxes as a disincentive to work as well as to save, particularly among high-income earners.
- Reduces the quantity of labour
- Reduces savings reduce investments
- Affects the price mechanism in resource markets of labour and capital so income taxes creates allocative inefficiency

