

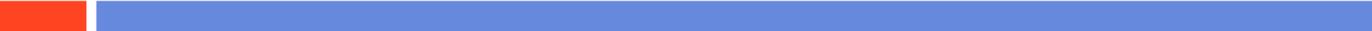
Welfare Economy

Chapter 1

Welfare, an individual and collective concept

We present what is welfare for economists, we elaborate the bedrock of normative economics

Welfare Economics



Welfare economics aims to define and to measure social welfare, and to provide evaluations of public policies.

A typical question : between different economic situations, more precisely, between different resource allocations, which is the best ?

It follows that a deep critical analysis of the instruments is required in that field.

Individual and collective welfare

First,

the welfare should be defined at the individual level.

There are many measures

It could be a *declarative measure* : *how do you feel your welfare is?*

It could be the *utility of consumption* : *What bundle do you prefer?*

Second,

the welfare should be defined at the collective level

There are many measures

From a *qualitative* point of view, definition of the Pareto optimal allocation

From a *quantitative* point of view, consider weighted average of the utilities

Vocabulary

All of those words should be reviewed (in textbooks or in wikipedia)

- declarative measure
 - Bundle (of goods)
- weighted average
 - qualitative measure
 - quantitative measure
- Welfare
 - Utility function
 - Allocation (of resources)

Map of the talk

1) Individual welfare

- Declarative welfare, Happiness,
- Utility functions
- Time and Inter-country comparisons

2) Collective welfare

- Pareto optimal (or efficient) allocations
- Social Welfare Functions and utilities

1a. Individual welfare

- Declarative welfare, Happiness,

Happiness on a scale from 1 to 10

Updated 31 December 2018

Ever since I started tracking my happiness, I have seen a lot of different scales being used. My method of tracking happiness uses a scale from 1 to 10. Over the years, I have received a lot of questions and comments about this happiness scale. There are many reports, platforms, surveys and apps that track happiness on a different scale!

This article discusses why the Tracking Happiness method is based on a happiness scale from 1 to 10. I also explain the different pro's and cons to other happiness scales, and why in the end it really doesn't matter all that much what scale you use.

Before we dive into the article, let's have a look at our happiness scale from 1 to 10.



Rating happiness on a scale from 1 to 10

Happiness

Given its very nature, reported happiness is subjective.

It is difficult to compare one person's happiness with another's

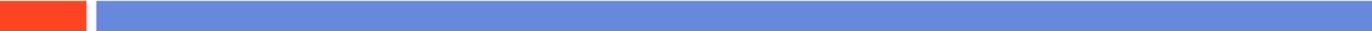
It can be especially difficult to compare happiness across cultures

One concern has always been the accuracy and reliability of people's responses to happiness surveys.

Objective measures such as lifespan, income, and education are often used as well as or instead of subjectively reported happiness, though this assumes that they generally produce happiness, which while plausible may not necessarily be the case.

By itself, Happiness, on a scale of 0 to 10 is not objective. However, economists do measures of correlations between happiness and more objective measures.

Happiness and income



There is a significant association between GDP and happiness, with citizens in wealthier nations being happier than those in poorer nations.

However, in the 2000s, several studies have obtained the opposite result, so this Easterlin paradox is controversial.

In 2010, Daniel Kahneman and Angus Deaton found that higher earners generally reported better life satisfaction, but people's day-to-day emotional well-being only rose with earnings until a threshold annual income of \$75,000.

Happiness and social security



There is this idea that a more generous welfare state contributes to higher levels of life satisfaction, and does so to rich and poor alike.

Happiness and Employment

Generally, the well-being of those who are employed is higher than those who are unemployed.

Employment itself may not increase subjective well-being, but facilitates activities that do (such as supporting a family, philanthropy, and education).

Feelings of autonomy and mastery, found in higher levels in the employed than unemployed, are stronger predictors of subjective well-being than wealth.

However, The negative effect of working more or working less than preferred has been found across multiple studies,

In countries with an average social norm to work, the well-being of men increases after retirement, and the well-being of retired women is at the same level as women who are homemakers or work outside the home

In rich societies, personal relationships are the determining factors of happiness.

There is a significant correlation between feeling in control of one's own life and happiness levels.

Democracy and federalism bring well-being to individuals, the more direct political participation possibilities available to citizens raises their subjective well-being.

Contributing and resulting factors in the relationship between leisure and happiness include psychological mechanisms, and the types and characteristics of leisure activities

Economic consequences of Happiness



Happiness may act as a determinant of economic outcomes : it increases productivity, predicts one's future income and affects labour market performance.

John Helliwell (UBC) tried to understand the reason of Happiness (on a scale from 0 to 100) and found regularities for people from a same country

- multiplying by two the income increases happiness by 1.4
- A regular work increases happiness by 1.7
- Marriage increases happiness by 3.8
- Unemployed people have in average 5 units less happiness than workers
- People with hard health disease have in average 8 units less happiness healthy people

1b. Individual welfare

- Utility functions

From measure of pleasure to preference ordering

So, whatever be the declaration, one aims to understand to what objective criteria it could corresponds.

Within economics the concept of utility is used to model worth or value, but its usage has evolved significantly over time. The term was introduced initially as a measure of pleasure or satisfaction within the theory of utilitarianism by moral philosophers such as Jeremy Bentham and John Stuart Mill. But the term has been adapted and reapplied within neoclassical economics, which dominates modern economic theory, as a utility function that represents a consumer's preference ordering over a choice set.

Preference ordering

Usually, Preference ordering is about goods and consumption, not directly income. Consumptions encompass :

- Luxury goods
- Everyday consumption
- Poverty : lack of good
- Savings and Borrowing
- Life-cycle consumption plan
- Growth : more consumption
- Necessity goods

A measure for understanding behavior



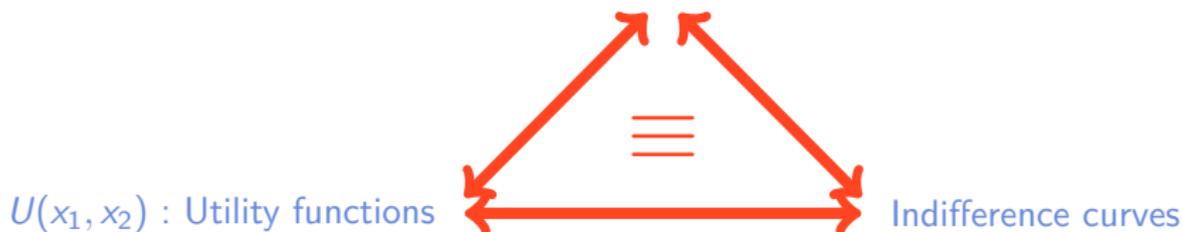
Preferences represents the advantage, pleasure, or fulfillment a person gains from obtaining or consuming a good or service.

Preferences (or utility) is used to explain how and why individuals and economies aim to gain optimal satisfaction in dealing with scarcity. People with different utility have different behavior.

Utility and indifference curves are used by economists to understand the underpinnings of demand curves, which are half of the supply and demand analysis that is used to analyze the workings of goods markets.

Three instruments to measure Preference ordering

$MRS(x_1, x_2)$: Marginal Rate of substitution



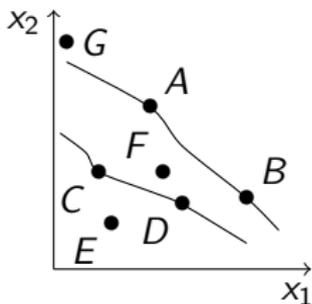
- MRS measures the relative value of each goods in terms of the other goods
- Utility function assigns a number to each bundle, increasing with contentment
- An indifference curve is a graph showing combinations of many goods that give the consumer equal satisfaction and utility.

Indifference curve

Indifference curve is the locus of various bundles providing equal utility to the consumer. Standard indifference curve analysis operates on a simple two-dimensional graph. One kind of economic good is placed on each axis. Indifference curves are drawn based on the consumer's presumed indifference.

For example, a young boy might be indifferent between possessing two comic books and one toy truck, or four toy trucks and one comic book.

Graphic example : Lets have a look to the following Indifference map drawn for a particular consumer : That particular consumer is indifferent between bundles A and B, and also between C and D. We deduce more information :



Order the bundles A,
B, C, D, E, F, G

Answer : $G \succ A \approx B \succ F \succ C \approx D \succ E$

Utility functions

Definition

Consider a set of alternatives facing an individual, and over which the individual has a preference ordering. A utility function is able to represent those preferences if it is possible to assign a real number to each alternative, in such a way that alternative a is assigned a number greater than alternative b if, and only if, the individual prefers alternative a to alternative b . In this situation an individual that selects the most preferred alternative available is necessarily also selecting the alternative that maximises the associated utility function.

- ▶ Given an indifference map, $U(x_1, x_2)$ represent it if,
 - U is constant over each indifference curve
 - U is increasing with more goods $\left(\frac{\partial U}{\partial x_i} \geq 0, \forall i\right)$
 - The following equivalence holds everywhere : $U(\vec{x}) \geq U(\vec{y}) \iff \vec{x} \succeq \vec{y}$

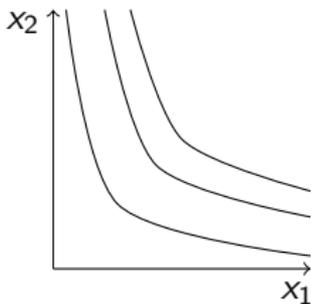
Exemples

► $U(x_1, x_2) = x_1 + x_2$

- Even if goods are by nature different, they bring a similar satisfaction for this particular consumer

► $U(x_1, x_2) = x_1 x_2$

- To get a great utility, it is necessary to consume more of the two goods :



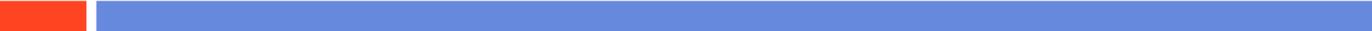
Marginal Rate of Substitution

Definition

Given a bundle (x_1, x_2) that belongs to the consumer, let *the marginal rate of good 1 in good 2* is the amount of good 2 that the consumer would accept to lose in order to gain **1** more unit of good 1.

- That is the objective relative price matching goal concept
 - That introduce (popular) ranking scales between goods
 - It is the slope of the indifference curve at (x_1, x_2) or the .
- ▶ The *relative price of good 1 in good 2* is the amount of good 2 that you could afford by selling **1** unit of good 1. It is p_1/p_2
- ▶ It is not far from the concept of willingness to pay

Back to behaviors with the willingness to pay



The willingness to pay a good is the price above which your behavior changes. If the price of the good is above your willingness to pay, you don't buy the good. If the price of the good is below your willingness to pay, you immediately buy the good.

Fixing the public good for an individual

An individual is indifferent among the combinations of public and private goods shown in the following table :

Combination	Public goods	private goods
A	1	16
B	2	11
C	3	7
D	4	4
E	5	3
F	6	2

Draw the individual's indifference curve. Assuming that the economy can produce one unit of public goods and ten units of private goods, but that it can produce one more unit of public goods by reducing its production of private goods by two units, draw the production possibilities schedule. What is the maximum production of private goods? The maximum production of public goods? Can it produce five units of public goods and one unit of private goods? Which of the feasible combination maximizes utility?

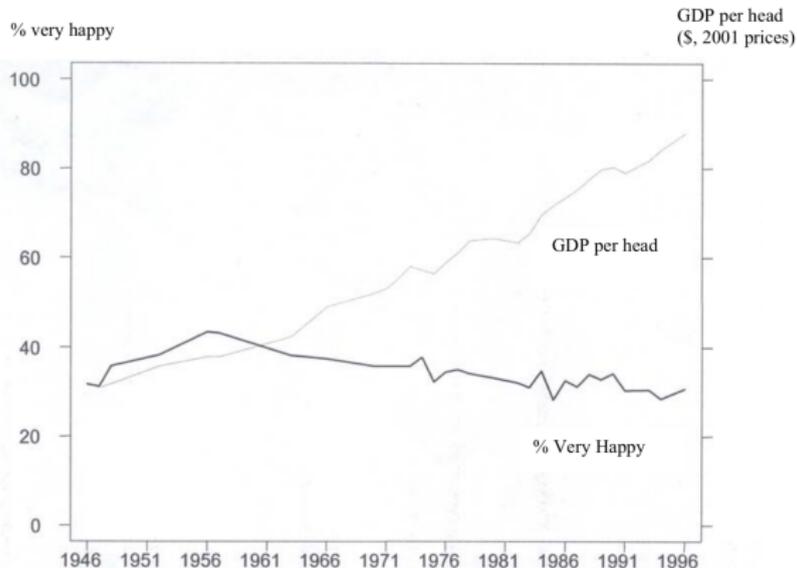
1c. Individual welfare

- Time and Inter-country comparisons

Easterlin Paradox

As you can see in the next picture, the proportion of people who said they were very happy rose in the 1950s, fell in the 1960s and has been fairly stable ever since. The contrast with the trend in GDP per head is striking.

Figure 4
Income and happiness in the USA



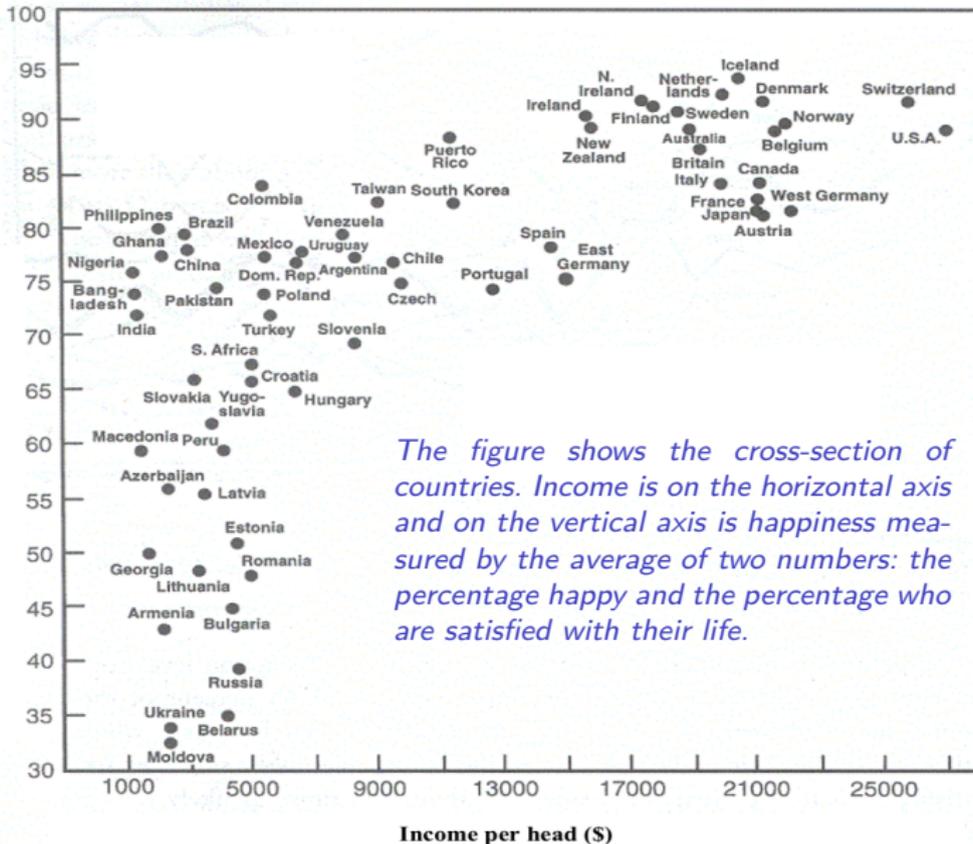
Easterlin Paradox Explanation

What to think about ?

- 1 People have simply shifted upwards the standard of happiness which they identify as “very happy”. Their expectations of happiness have risen, so that, although they are truly happier, they do not report themselves as such.
- 2 if people now expect to be happier than people used to be in the past, one would expect the biggest changes in expected happiness to occur between cohorts, rather than within cohorts. Yet within each cohort the level of happiness is remarkably flat over the lifespan, despite sharp rises in income over the lifespan.
- 3 European survey data also tell us whether people are “satisfied with their life”. The word satisfied has a more relativistic character than the word happy. Also, there is rise in depression and crime.

Intercountry comparison

Happiness (index)



The figure shows the cross-section of countries. Income is on the horizontal axis and on the vertical axis is happiness measured by the average of two numbers: the percentage happy and the percentage who are satisfied with their life.

First remarks

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- As it shows, once a country has over \$15,000 per head, its level of happiness appears to be independent of its income per head.
 - For poorer countries, however, there is a clear impact of income on happiness, which is also borne out by the time-series in India, Mexico and the Philippines.
 - When you are near the bread-line, income really does matter.

If the figure tells us something about economics, it also tells us something about politics. The most striking finding is the misery of Russia and South Africa, where oppression as well as poverty has degraded the human condition.

Possible comparison ?



Of course one could question whether the word 'happy' means the same thing in different languages. If it does not, we can learn nothing by comparing different countries. However countries can be rated separately on three different measures : how 'happy' they are, how 'satisfied' they are, and what score they give to life, using a scale running from 'worst possible life' to the 'best'. The ranking of countries is almost identical on all three measures. This suggests that words are not causing a problem.

2a. Collective welfare

- Pareto optimal (or efficient) allocations

Motivation for a theory of normative economics

In economics, even if there is agreement about the full consequences of some policy, there may be disagreement about whether the policy is desirable.

There are frequently trade-offs,

- a policy may increase national output but also increase inequality
- it may increase employment but also increase inflation
- It may benefit one group but make another group worse off

and individuals may weigh these consequences in different ways

Feasible allocation

Economies depends upon a lot of decisions; some of them are made by the government, but many of them are left up by a myriad of firms and household. So, there are many possible outcome of the economy, what we call a *feasible allocation*.

Definition

A *feasible allocation* of resources is a description of what obtains every economic agent, when public choice are set and when the decisions of productions and consumptions are made.

- An allocations does not describes the quantities of goods employed in production, but only the quantities of goods consumed by each human economic agent, when production is achieved.
- We can associate to each allocation the utilities that each agent obtain

Pareto optimal allocation

Definition

A resource allocation that have the property that no one can be made better off without someone being worse off is said to be *Pareto efficient*.

- ▶ Assume for instance that the government is contemplating building a bridge and that those who wish use the bridge are willing to pay more than enough in tolls to cover the costs of construction and maintenance. The construction of this bridge is likely to be a Pareto Improvement, that is a change that makes some individual better off without making anyone worse off.

Continuing the example

In the bridge example, there are always people that might be adversely affected by the construction of the bridge.

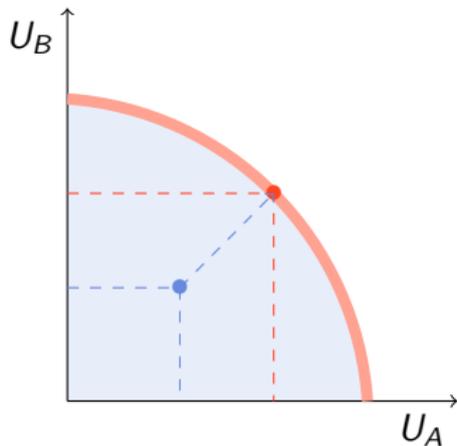
For example, if the bridge change the traffic flow, some stores might find that their business is decreased and they are worse off.

Or an entire neighborhood may be affected by the noise of bridge traffic and the shadows cast by the bridge superstructure.

Frequently on summer days, or at rush hour, large backups develops at toll booths on toll roads and bridge. If tolls were raised at those time and the proceeds used to finance additional toll booths or more peak-time toll collectors, everyone might be better off. People would prefer to pay a slightly higher price in return for less waiting. But even this change might not be a Pareto improvement : among those waiting in line may be people relatively little concerned by the waste of time but who are more concerned about spending more money in tolls.

Agreeing not to be inefficient

The concept of Pareto optimal allocation is minimal : An allocation is said optimal is there is no allocations that gives more utility to everybody. For instance, in the case of an economy with two agents, call them A and B , we can represent the utility that both could obtain with all the feasible allocation (blue area). Are efficient the Pareto frontier drawn in red.



Mum, Car and Doll

- A mother has to share a doll and a car between her daughter and her boy, how many effective Pareto allocations do you have?
- ▶ To analyze that example, we should consider the preferences of the daughter and the boy.

$$\text{Daughter : } \{D, C\} \succeq \{D\} \succeq \{C\} \succeq \emptyset \quad (1)$$

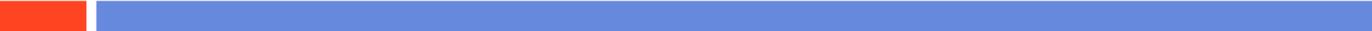
$$\text{Boy : } \{D, C\} \succeq \{C\} \succeq \{D\} \succeq \emptyset \quad (2)$$

we should enumerate all feasible allocations and count the inefficient ones.

2b. Collective welfare

- Social Welfare Functions and utilities

Main question : choose between different Pareto allocations



How do economists think systematically about how to make social choices when there are trade-offs, that is, when after finding all possible Pareto Improvements, gains to the welfare of one individual must come at the expense of the welfare of others ?

What is the social welfare function and why economists find this concept useful ?

Social Welfare Function

Definition

A social welfare function is a function that ranks social states (alternative complete descriptions of the society) as less desirable, more desirable, or indifferent for every possible pair of social states.

There are two major distinct but related types of social welfare functions :

- A Bergson–Samuelson social welfare function considers welfare for a given set of individual preferences or welfare rankings.
- An Arrow social welfare function considers welfare across different possible sets of individual preferences or welfare rankings and seemingly reasonable axioms that constrain the function.

Bergson-Samuelson Social Welfare Function

The "Bergson-Samuelson" social welfare function (SWF) takes the following general form :

$$W = W(U_1, U_2, \dots, U_H)$$

so that "society's" welfare denoted, W , is merely a function of the utilities of its constituent members, U_h , $h = 1, 2, \dots, H$, where H are the number of households in society.

In using welfare measures of persons in the society as inputs, the social welfare function is individualistic in form. It provides the government with a simple guideline for achieving the optimal distribution of income.

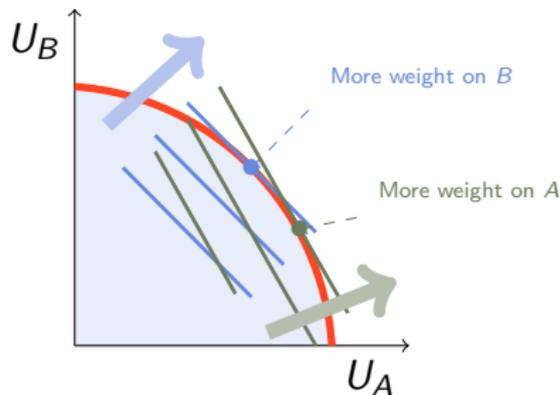
Linear Social Welfare Function

As a leader of the classical utilitarianism, Bentham argued that society should maximize the sum of utilities of its members; In its view, the SWF is $SWF = \sum_{h=1}^{h=H} U_h$

One can generalize that idea by considering a weighted sum of the utilities of the households : $SWF = \sum_{h=1}^{h=H} \alpha_h U_h$

Proposition

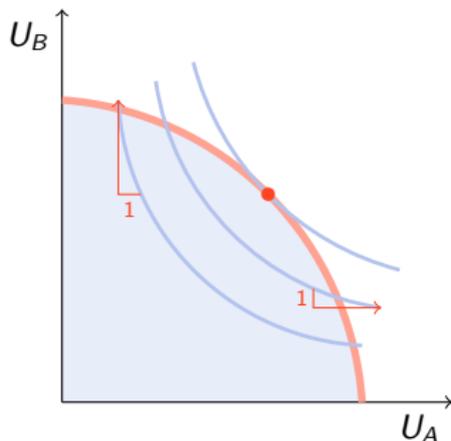
If the set of feasible allocations is convex, then, to any Pareto optimal allocation corresponds one set of weights, such that that particular allocation is the one maximizing the households weighted sum.



Social indifference curves

How the society select a point among the Pareto frontier ?

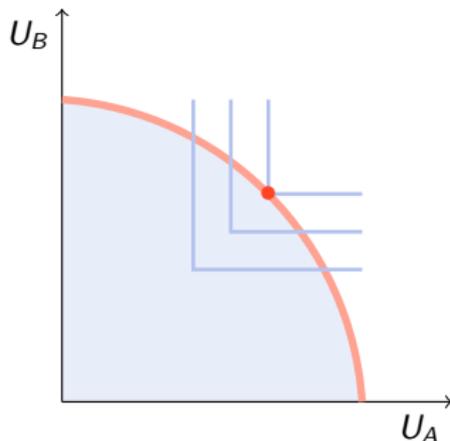
Social indifference curves describe how society might make trade-offs between utility levels of different individuals. A social indifference curve gives those combinations of utility of, say individual A and B , between which society is indifferent.



Here the SWF is such that society requires more than an equal increase of the utility of a rich individual to compensate for one unit of decrease of a poor individual

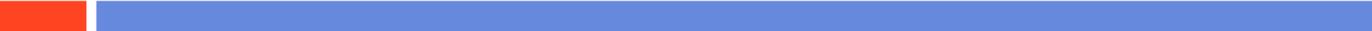
Alternative Social Welfare Functions

Rawls maintains that no amount of increase in the welfare of the rich can compensate for a decrease in the welfare of the poor. This implies that the social indifference curves are L-shaped.



Rawls argue that the welfare of society only depends on the welfare of the worst-off individual ; Society is better off if you improve his welfare but gains nothing from improving the welfare of others.

Interpersonal comparisons



While public economists make extensive use of the SWF and the possibility utility curve, these concepts have been extensively criticized, on several grounds.

Indeed, SWF suppose that

- this is a meaningful way of measuring an individual utility
- there is a scientific basis to making welfare comparisons