



History of Social Choice and Welfare Economics



What is Social Choice Theory?

- SCT concerned with evaluation of alternative methods of collective decision making and logical foundations of welfare economics
- Welfare economics concerned with evaluation of economic systems and policies

In the beginning

- => SCT can be traced to antiquity as long as multiple individuals involved in deciding some method invoked
- 4th C B.C. Aristotle in Politics, [Kautilya](#) in Economics explored collective-decision possibilities
- Design of economic mechanisms or policies cannot avoid social welfare judgment (distribution of costs and benefits)

Instrumental and Theoretical

- Welfare point of view central to Bentham and English utilitarians
- Except for positive spirit of Ricardian economics, it can be found in English classics like J. S. Mill
- 1) Instrumental concern with concrete methods of CDM – old
- 2) Theoretical investigation into CDMs logical performance – more recent

Condorcet and Borda

- Real origin of formal CDM contributed to Marie-Jean de Condorcet and Jean-Charles de Borda (around time of French revolution)
- “It was the intellectual atmosphere of the European Enlightenment during the eighteenth century, with its conspicuous concern with human rights and its reasoned design and implementation of rational social order, that Condorcet (1785)” addressed the mathematical discipline of CDM in terms of simple majority voting and related procedures” Suzumura

Condorcet paradox

- Condorcet paradox
- With simple majority and three alternatives a cycle can occur where there is no *Condorcet winner* => *no social choice possible*
- *A = any restriction placed on commerce is an injustice*
- *B = only those restrictions placed through general laws can be just;*
- *C = restrictions placed by particular orders can be just*

Borda rank-order

- Condorcet's work partly inspired by Borda (1781) who proposed the *Borda method* of rank-order decision making
- For n alternatives worst alternative gets score 0 and best $n-1$, *scores added and candidate with highest score wins*
- French academy adopted method for electing members and used till 1800 when attacked by Napoleon Bonaparte

Dishonesty proof

- Pierre-Simon Laplace (1812) observed a problem, voters may place the strongest opponents to their favorite candidate at the bottom of the list...enhancing the chances of the mediocre
- Borda also saw this difficulty and said that his scheme was “only intended for honest men”
- =>strategic manipulation of voting scheme

Single Peak

- Intermittent exploratory work in nineteenth century: Charles Lutwidge Dodgson known by his pseudonym (Lewis Carroll) was second only to Condorcet in his understanding of voting schemes
 - Major breakthrough in late 1940s by Duncan Black (1948): found sufficient condition *single-peaked preferences* for simple majority (with odd number) to pick just one alternative
- => First possibility result; opened way for modern theory of voting

Greatest Happiness Principle

- Welfare economics part can be attributed to Bentham (1789)
- In contrast to Condorcet, Bentham a stark critic of the concept of inviolable natural rights “nonsense upon stilts”
- Instead foundation the *greatest happiness principle*
- Legislator arrange laws and statutes accordingly

Utilitarianism

- Utilitarian approach permeated work of John Stuart Mill, Alfred Marshall, Francis Ysidro Edgeworth, and Henry Sidgwick
- Pigou (1920) synthesized this tradition in early 20th Century
- Pigou's "old" welfare economics presupposed cardinal interpersonally comparable utility

Ordinalism

- Robbins (1935) harsh ordinalist critic – denial of possibility of ‘objective’ interpersonal comparisons
- By end of 1930s new foundations of *ordinal* and *interpersonally non-comparable* utility information
- Ironically same informational basis of Borda-Condorcet theory

Pareto principle

- Ordinalists turned to *Pareto principle*
- John Hicks (1939) 'new' welfare economics made Pareto efficiency central exercise
- But limited scope of Pareto principle (no guidance where losses to some) led to *compensation criteria* (Nicholas Kaldor, Tibor Scitovsky, Paul Samuelson) of a hypothetical nature

Social Welfare Function

- 2nd approach *social welfare function* by Abram Bergson (1938) and Paul Samuelson (1947) – investigate logical consequences of any value judgments irrespective of origin
- On this basis attempted separation of ethics (where economists qua scientists have nothing to say) from welfare economics

Compensationalist school

- The compensationist school of 'new' welfare economics confronted serious logical contradictions: *lack of asymmetry* or *transitivity* in welfare judgments based on Kaldor-Hicks-Scitovsky criteria (credibility fatally damaged)

Enter Rawls

- This was the backdrop to the publishing of Kenneth Arrow's Ph.D. Dissertation: *Social Choice and Individual Value* in 1951
- At this time a fundamental criticism of the Benthamite utilitarianism by John Rawls (1962) focused on the ethical nature of the outcome morality
- Classical utilitarianism: "society is rightly ordered, and therefore just, when its major institutions are arranged so as to achieve the greatest net balance of satisfaction summed over all the individuals belonging to it"

Rawls' critique

- Classical utilitarianism based on
 - Welfarism (utility information)
 - Sum-ranking
- Rawls proposed alternative informational basis: *social primary goods* “things that every rational man is presumed to want”
- Rawls critical of sum-ranking for being indifferent to distribution of benefits and proposes equal distribution of primary goods unless an unequal distribution favors the least well off
- Invoked the *original position* and *veil of ignorance*

Social choice and Individual Values

- Kenneth Arrow's SC and IVs brought social choice theory to a qualitatively different level
- All previous work (Condorcet, Borda,...) were concerned exclusively with some specific voting scheme
- In contrast, Arrow developed an analytical method allowing a unified framework for all voting schemes

From individual to social

- Consider simplest imaginable society with only two individuals and three alternatives
- There exist six distinct preference orderings of the three social states:
 - $\alpha: x,y,z$ $\beta: x,z,y$ $\gamma: y,x,z$
 - $\delta: y,z,x$ $\varepsilon: z,x,y$ $\zeta: z,y,x$
- Each one can represent individual preference ordering for 1 and 2 over three social states

From individual to social

- Arrow christened *social welfare function* (*constitution*) a function that maps each profile of individual preference orderings into a unique social preference ordering (aggregating process)
- There exist an astronomical 6^{36} (10^{28}) social welfare functions
- Cannot check all of these for democratic legitimacy: axiomatic approach allowed him to analyze all at once

Arrow *Possibility* Theorem

- Imposed a set of axioms deemed necessary for *reasonable* social welfare functions
- Lead to celebrated *general possibility theorem* or *Arrovian impossibility theorem*: there exists no social welfare function satisfying a set of conditions necessary for democratic legitimacy and informational efficiency

Politics, Ethics or Economics?

- In contrast with Bergson-Samuelson SWF which was assumed outside economics, Arrow believed that the *process* or *rule* for constructing the B-S SWF should also be a subject of logical scrutiny (for economics to have social relevance)
- In this sense Arrow's work is a basic criticism against the foundations of "new" welfare economics
- Samuelson doubted that the Arrow theorem related to B-S swf and thought it related to politics rather than economics

Axioms

- 1. individuals free to express any preferences over social states and swf must be able to aggregate these into social preference ordering
- 2. swf must reflect the unanimous preference expressed by all individuals over a pair of social states (minimally democratic)

Axioms

- 3. swf informationally efficient in that sufficient to know individual ranking of two alternatives to be able to socially rank them
- 4. there should be no *dictator* whose preferences determine social preferences
- Majority voting satisfies these conditions but leads to intransitivities
- No voting procedure satisfies all 4 axioms

Socialist Planning Controversy

- Ludwig von Mises (1920) believed that monetary prices are necessary for rational calculation: “affords us a guide through the oppressive plentitude of economic potentialities” making computation and attainment of higher goods possible
 - Impossibility thesis: since collective ownership prevails in a socialist state, production goods will not become object of market exchange

Socialist Planning Controversy

- Oskar Lange (1938) countered that “efficiency prices” exist irrespective of ownership structure of means of production
- Friedrich von Hayek (1935, 1944, 1948) never denied the existence in theory of “efficiency prices” but focused on the complexity and difficulty of motivating individuals to submit private information to central authorities in order to compute these

Socialist Planning Controversy

- Oskar Lange (1936-7) and Abba Lerner (1944) countered with their *Lange-Lerner market socialism*
 - markets allow consumers and workers to choose goods and occupations
 - prices of capital goods and productive resources other than labor are mere 'accounting prices' calculated by Central Planning Board as Walrasian auctioneer

Socialist Planning Controversy

- Sonnenschien-Mantel-Debreu Theorem however shows that general equilibrium neither unique nor stable raising problems for both the market and market socialism
- Incentive compatibility problem: “Prices must be treated as constant as they are treated by entrepreneurs on a competitive market” but for managers in centrally planned system accounting prices treated strategically.

Socialist Planning Controversy

- But as von Hayek observed: “the common feature of collectivist systems...[is] the deliberate organization of the labours of society for a definite social goal”, not just efficiency
- But if consumer sovereignty is key (democracy) we are trying to construct a conscious social goal on the basis of individual judgments (=Arrow’s goal)
- Socialist Planning Controversy forerunners of theory of mechanism design (decentralized planning)

Gibbard-Satterthwaite Theorem

- “As long as there are at least three alternative outcomes and at least two voters, there exists no non-dictatorial voting scheme which is free from strategic misrepresentation of preferences by individuals”, i.e., ubiquity of strategic manipulation of voting schemes.
- New possibilities lie beyond the narrow confines of the welfarist-consequentialist approach (social primary goods, capabilities, theories of individual)

Structure of Course

- Focus on distributive justice (endstate justice)
- 1. Four underlying norms: *exogenous rights, compensation, reward, and fitness*
- *Collective welfare*
 - 2. Cardinal welfarism
 - 3. Ordinal welfarism
 - 4. Arrow's Impossibility Theorem

Structure of Course

- Competitive Markets: Partial Equilibrium
 - Two welfare theorems
- Externality and Public Goods
 - market failure and private information
- Adverse selection and moral hazard
- Mechanism design
 - Gibbard-Satterthwaite impossibility