HISTORY OF ECONOMIC THOUGHT

Lecture Notes for Week 10

Tomáš Cahlík

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General Economic Equilibrium Research Program

Leon Walras and Vilfredo Pareto were on the beginning of the General Economic Equilibrium research program.

Let us repeat the information about Leon Walras from the 4th week:

""Léon Walras (1834 – 1910) *was a French economist. His most notable work involves his formulation of a mathematical model to describe how supply and demand across different markets interact simultaneously to determine prices in an economy. His seminal book "Elements of Pure Economics" (1874), introduced the concept of general equilibrium. Walras used a system of equations to model the economy, demonstrating how individual markets are interconnected and how they reach a state of equilibrium. Marginal analysis is present in his definitions of demand and supply functions.*

Aside of his theoretical work, Walras worked on practical issues as well. "Etudes d´économie social" (1896) and "Etudes d´économie politique apliquée" (1898) are collections of earlier work on social justice, property, distributional issues and monetary questions.

His work laid the groundwork for the Theory of General Equilibrium, a central concept in economics that seeks to explain the functioning of economic markets as a cohesive whole rather than in isolation.

Walras modeled an economy as a system of markets and his aim was to show that this system can come to a general equilibrium in which demand equals supply in all markets.

He presented his general equilibrium model as a system of equations; each equation is for one market either for a productive service or for a consumer good. There are n productive services and m consumer goods in his model.

Variables:

- *n quantities of productive services,*
- *m quantities of consumer goods,*
- *n prices of productive services,*
- *(m-1) prices of consumer goods (one consumer good is the "numeraire" with price set to 1),*
- ***(2m+2n-1) is the** total number of variables.*

Equations:

- *n+n equations for supply and demand of productive services,*
- *m+m equations for supply and demand of consumer goods,*
- *Walras´s law: If all markets but one are in equilibrium, then the last market must be in equilibrium, too.*
- *So, we have **2m+2n-1** independent equations **for 2m+2n-1** variables.*

Walras assumed that there exists one equilibrium, in other words that there exists a unique set of prices and quantities for which all markets are in equilibrium.

How does the system come into equilibrium? Walras used the mechanism of a Crier (an Auctioneer). The mechanism works like this:

- *The Crier announces all prices and gathers information about demand and supply in all markets,*
- *The Crier changes prices based on this information and announces new prices,*
- *This is done as long as demands are not equilibrated with supplies in all markets,*
- *Then exchanges in all markets occur – no exchanges occur before the equilibrium prices are found.*

Let us cite from his "Elements d´économie politique pure" (1874):

"The markets which are best organized from the competitive stand point are those in which purchases and sales are made by auction, through the instrumentality of . . . criers acting as agents who centralize transactions in such a way that the terms of every exchange are openly announced and an opportunity is given to sellers to lower their prices and to buyers to raise their bids. "

This model opened the research on general equilibrium. Basic questions that the Theory of General Equilibrium analyzes are: Does the General Equilibrium exist? Is there only one equilibrium? Is the equilibrium stable? What mechanism brings the system back to equilibrium if it happens to be out of equilibrium?""

Other question linked with Walras´s model is following: In the tatonnement process, no exchanges occur before the auctioneer cries out correct prices, i.e. prices that clear simultaneously all markets. With these prices, profit is zero, so no incentive exists for entrepreneurs. Without an incentive, why do they take part in economic activities?

More than 150 years of research activity were centered in finding solutions to previous questions. This has been the essence of the research program General Economic Equilibrium.

Vilfredo Pareto (1848 – 1923) was an Italian economist, sociologist, and philosopher. He held the Lausanne University chair in economics since 1892, after Leon Walras. He applied further mathematical tools to the Walras´s general equilibrium approach.

He introduced the Pareto´s Law, often referred to as the Pareto Distribution or the Pareto Principle or the "80/20 rule, which posits that roughly 80% of effects come from 20% of the causes. In the context of personal income distribution, there is an empirical observation that in many societies, a large portion of wealth is held by a small number of people. Specifically, Vilfredo Pareto observed in the early 20th century that approximately 80% of Italy's land was owned by 20% of the population, and he found similar patterns in the distribution of income and wealth in other countries. It is recommended to look at the freeware´s Netlogo Model Library for simulations of income distribution to see how Pareto Distribution is generated.

Pareto abandoned the cardinal utility in favor of the ordinal utility (Irving Fisher worked on the ordinal notion before him) and elaborated it into the Pareto Optimum or Pareto Efficiency. Pareto Optimum is when resources are allocated in the most efficient manner, with no individual able to be made better off without making someone else worse off. The British economist Edgeworth gave it its name, Pareto gave the name to the Edgeworth box.

Solution of the problem of existence, uniqueness, and stability in different General Equilibrium Models: Developments in mathematics and the exodus of European thinkers to the USA before WW2 supported the work on these problems. Let us name just some results:

- Paul Samuelson presented *The Stability of Equilibrium, Comparative Statics and Dynamics* (1941) and *Foundations of Economic Analysis* (1947). In the latter he also reformulated the tatonnement process with the use of differential equations,
- In 1951: Arrow and Debreu presented two articles which demonstrated the optimality properties of a competitive equilibrium,
- In 1952: Arrow, Debreu, and McKenzie at a meeting of Econometric society demonstrated the existence of equilibrium in their models,
- In 1958: Arrow and Hurwitz presented the article *On the Stability of Competitive Equilibrium,*
- In 1960, Herbert Scarf presented the article *Some Examples of Global Instability of the Competitive Equilibrium.*

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Kenneth Arrow (1921 – 2017) was an influential American economist and mathematician. He is renowned for his "Impossibility Theorem," or "Arrow's Paradox" which highlights the complexities of creating a fair social welfare function from individual preferences. Arrow also made vital contributions to general equilibrium theory and the economics of information. His work in these areas earned him the Nobel Memorial Prize in Economic Sciences in 1972, which he shared with Sir John Hicks.

Gérard Debreu (1921- 2004) was a French-American economist and mathematician, known for formalizing the theory of general equilibrium. His 1959 work *Theory of Value* provided the mathematical proof for the existence of economic equilibrium. Debreu's contributions earned him the Nobel Prize in Economic Sciences in 1983.

Lionel McKenzie (1919 – 2010) was an American economist best known for his contributions to the theory of general equilibrium and capital theory. McKenzie was instrumental in developing rigorous proofs of the existence and efficiency of competitive equilibrium, alongside economists like Kenneth Arrow and Gérard Debreu.

Leonid Hurwicz (1917 – 2008) was a Polish-American economist and mathematician. He is best known for his pioneering work in mechanism design theory, which examines how institutions can achieve desired outcomes through strategic settings. Hurwicz's contributions laid the groundwork for much of modern economic theory and game theory. In 2007, he was awarded the Nobel Memorial Prize in Economic Sciences, shared with Eric Maskin and Roger Myerson, for his fundamental role in developing mechanism design theory.

Herbert Scarf (1930 – 2015) was an American economist and mathematician. He was renowned of his work in mathematical economics, particularly in developing algorithms for computing general equilibrium in economic models. Scarf's algorithm for fixed points provided a practical method for solving complex economic models and significantly advanced computational economics.

General Criticism of General Equilibrium (GE) Models:

- GE Models are not realistic. Ongoing research has not led to persuasive results with at least minimally realistic assumptions,
- GE Models are not relevant for solving important economic problems,
- GE Models have a weak explanatory and forecasting power,
- GE models are good tools for the ruling class; they show the possibility of the existence of general harmony.

Arguments Protecting GE Models:

- Realism is not important. A pure theory is not an imitation, description, or reflection of reality but a parable. GE models describe a possible ideal world, even analyzing ideal worlds can bring some insight to the functioning of the real world.

- Areas in which GE models are not relevant ought to be tackled with some other approach. GE Models are relevant for tackling the problem of efficient allocation of scarce resources. Who decides which problems are important?
- Research moves forward, so the research program may give good explanations and predictions at the end,
- GE research inspires research in specific theoretical fields and in forecasting,
- GE model represents a general framework that keeps many theoretical pieces together,
- It can be used as a taxonomic instrument.

Theoretical Criticism of General Equilibrium (GE) Models:

- GE Models are inconsistent:
    - For consistency, it would be necessary to demonstrate that in the individualistic competitive framework the market is able to lead the economy towards an equilibrium,
    - It has been proved that the behavior of individuals is not sufficient to give the invisible hand the strength it needs to lead the market towards equilibrium. Strong hypotheses on behavior of certain aggregate variables are necessary to lead the economy to a stable equilibrium.

Dynamic Stochastic General Equilibrium (DSGE) Models are the current state of the art. They are widely used for policy analysis and economic forecasting. These models aim to explain aggregate economic phenomena such as growth, business cycles, and the effects of economic policy through the interaction of various economic agents, including households, firms, the government, and the central bank.

Key features of DSGE models include:

- Dynamic: They analyze how the economy evolves over time and how it responds to various shocks and policies. This time-based approach helps in understanding short-term fluctuations and long-term growth trends.
- Stochastic: DSGE models incorporate randomness in the form of shocks, such as technological changes, preferences, monetary and fiscal policies, or external factors

that influence the economy unpredictably. These shocks help explain economic fluctuations and uncertainty.

- General Equilibrium: The models are based on the concept of general equilibrium, where supply and demand across different markets are balanced. They consider the simultaneous equilibrium in multiple markets, ensuring that all economic agents are optimizing their decisions given their constraints.
- Microeconomic Foundations: DSGE models are built on microeconomic principles, focusing on the behavior of individual agents. They emphasize optimizing behavior, where agents (households, firms) make decisions to maximize their utility or profit subject to constraints, like budget constraints or production technologies.

DSGE models are used by central banks (e.g. by the European Central Bank and the Czech National Bank) and policy institutions to simulate the effects of monetary and fiscal policies, understand economic shocks, and guide decision-making based on theoretically grounded predictions.

Summary

The research program in General Economic Equilibrium (GE) was initiated by Léon Walras and Vilfredo Pareto. Walras introduced a mathematical model describing how supply and demand across different markets interact to determine prices, establishing the concept of general equilibrium. He presented an economy as a system of equations illustrating market interconnections and equilibrium. Pareto enhanced Walras's model using more mathematical tools and elaborated also other research areas; e.g. he introduced the concepts of Pareto Distribution or of Pareto Efficiency.

The development of GE models continued through the 20th century with significant contributions from economists such as Kenneth Arrow, Gérard Debreu, Lionel McKenzie, Leonid Hurwicz and Herbert Scarf who tackled problems related to existence, uniqueness, and stability of equilibrium.

Despite valuable insights, GE models faced criticism for being unrealistic and lacking explanatory power. Nonetheless, they are defended as theoretical constructs offering insights into efficient resource allocation and inspiring further economic research.

Today, Dynamic Stochastic General Equilibrium (DSGE) models build on the GE framework. DSGE models are used to explore aggregate economic phenomena, policy impacts, and the behavior of agents over time, incorporating randomness and microeconomic foundations. They are instrumental in policy analysis and forecasting for central banks and other institutions.

Welfare Economics, Freedom and Justice

In economics, two fundamental Welfare Theorems were proved by Arrow and Debreu in 1950s:

- Without market failures, a competitive Walrasian equilibrium is not Pareto-dominated by any feasible social allocation,
- Without market failures, given any desired Paretian allocation, it is always possible to distribute the initial endowments among individuals in such a manner that the competitive Walrasian equilibrium after exchanges will be that desired Paretian allocation.

Usual use of the second theorem is in sanctioning the separation between the efficiency problem and the distributive-justice problem. The initial endowments are not considered to be an economic problem; economic problem is the efficiency of the market process.

Dasgupta in *Positive Freedom, Markets and the Welfare State* (1986) formulated following paradox: A central authority with knowledge how to distribute initial endowments that would develop to a Paretian allocation could come to that allocation directly, without market exchanges. Another problem is that the competitive Walrasian equilibrium must be unique and stable, and neither has been proved in a realistic setup. In mainstream economics, these problems are ignored and discussion is centered around market failures.

With market failures, we cannot expect free markets to deliver Pareto efficient results. Practical remedy is correcting market failures; we believe that this remedy increases the efficiency of the free market system.

Market failures and their remedy:

- **Externalities** are costs or benefits that affect third parties who are not directly involved in an economic transaction. These effects can be either positive or negative, and they occur outside the market mechanism, meaning that the true social cost or benefit is not reflected in the market prices.
    - Remedy 1: Use of corrective measures, like corrective taxation or subsidies, was suggested by Pigou and further elaborated by Samuelson in 1940s,
    - Remedy 2: Decrease of transaction costs. Without transaction costs, markets can solve externalities autonomously, as Coase wrote in *The Problem of Social Costs* (1960).
- **Commons** refer to resources that are shared by a community and accessible to all members, but are not privately owned. These resources can include natural assets such as air, water, fisheries, forests, and grazing lands. The "tragedy of the commons" occurs when individuals, acting in their own self-interest, exploit a shared resource to the extent that demand overwhelms supply, leading to the deterioration or depletion of the resource. This happens because each individual receives the full benefit of their use of the resource, while the costs of depletion are distributed among all users. It was firstly described by Hardin in *The Tragedy of the Commons* (1968).
    - Remedy 1: Assignment of private property rights, as Chicago school suggests.
    - Remedy 2: Collective action or adding benevolence to the individual moral code, as Albert Hirschman and Amartya Sen suggest.
- **Public goods** are characterized by being non-excludable and non-rivalrous. This means they are available to everyone without depleting upon use and you cannot easily prevent people from using them. Examples include national defense and public parks. Due to these traits, public goods often face the "free rider problem", where individuals benefit without contributing to their costs, leading to potential under-provision in markets. It is interesting that Knut Wicksell, while analyzing public goods, did not realize the free

rider problem. Probably benevolence was part of the individual moral code in Sweden in his time.

- Remedy 1: Government supply,
- Remedy 2: Adding benevolence to the individual moral code.

- **Information asymmetry** occurs when one party in a transaction has more or better information than the other party. This imbalance can lead to market inefficiencies, as the less-informed party may make suboptimal decisions. Seminal article is George Ackerlof´s The *Market for Lemons* (1970).
  - Remedy 1: Adding benevolence to the individual moral code, Solution 2: Screening and monitoring. This is accompanied by the increase of transaction costs.

Analysis of market failures has helped the development of the New Institutional Economics and of the Theory of Public Choice. The latter applies economic principles to political processes, analyzing how voters, politicians, and bureaucrats make decisions. It assumes that individuals in the public sector act in their self-interest, similar to behavior in markets. This perspective helps explain the behavior of political actors, government inefficiencies, and policy outcomes. Public choice theory challenges the notion that government always acts in the public interest and highlights the possibility of government failures like rent-seeking and the influence of special interest groups on policy decisions. Essentially, it provides a framework to understand government behavior using the tools of economics.

With increasing public sector, problems of delivery of public goods are very relevant and very conflicting. Arrow in his book *Collective Choice and Individual Values* (1951) formulated his Impossibility Theorem. It asserts that no voting system can perfectly convert individual preferences into a collective decision while simultaneously satisfying a specific set of fairness criteria. These criteria are:

- Non-Dictatorship: No single voter has the power to determine the outcome,
- Unanimity (Pareto Efficiency): If all voters prefer one option over another, the group preference should reflect that ranking,

- Independence of Irrelevant Alternatives: The group's ranking between any two options should not be affected by the introduction or removal of other options,
- Universality: The voting system must work for any set of individual preferences.

Arrow proved that it is impossible to create a voting system that meets all these criteria simultaneously when there are three or more options. This theorem highlights the challenges in designing a perfectly fair voting system.

Before Arrow, Knut Wicksell concluded that only unanimous voting leads to Pareto efficient outcomes, but in practical setting majority voting must be used. It can be efficient with the existence of proper constraints.

James M. Buchanan, the father of Constitutional Economics, co-authored his book *The Calculus of Consent: Logical Foundations of Constitutional Democracy* (1962) with the political scientist Gordon Tullock. The book is a foundational text in public choice theory, exploring the decision-making processes in political systems using economic analysis.

Freedom and Justice: Analysis of market failures has farther helped with becoming more conscious of the importance of freedom and justice in economic affairs.

Milton Friedman in *Capitalism and Freedom* (1962) explores the relationship between economic and political freedom, advocating for free markets and minimal government intervention as essential components of a prosperous and free society.

Let us present some of his positions from chapters III and VIII of his book:

- Disagreement with the opinion that a private free-enterprise economy is inherently unstable,
- Belief that the Great Depression, like most other periods of severe unemployment, was produced by government mismanagement,
- Belief that what we urgently need, for both economic stability and growth, is a reduction of government interventions, not an increase in interventions,

- Belief that it is desirable that we use government to provide a general legal and economic framework that will enable individuals to produce growth in the economy, if that is in accord with their values.
- "The fundamental defect of a commodity standard is that it requires the use of real resources to add to the stock of money."
- "Once fiduciary elements have been introduced, it has proved difficult to avoid governmental control over them, even when they were initially issued by private individuals."
- "An automatic commodity standard is not a solution to the problem of establishing monetary arrangements."
- "After a large-scale abandonment of the gold standard after WW1, the Federal Reserve System established in 1913 had become a powerful discretionary authority able to determine the quantity of money in the United States and to affect international financial conditions throughout the world."
- "The Great Depression in the United States, far from being a sign of the inherent instability of the private enterprise system, is a testament to how much harm can be done by mistakes on the part of a few men that have discretionary power over the monetary system of a country."
- "Money is much too serious a matter to be left to the Central Bankers."
- "If a general rule for the conduct of monetary policy is adopted for a group of cases as a bundle, the existence of that rule has favorable effects on people's attitudes and beliefs and expectations that would not follow even from the discretionary adoption of precisely the same policy on a series of separate occasions."
- "The essence of a competitive market is its impersonal character. No one participant can determine the terms on which other participants shall have access to goods or jobs."
- "Monopoly exists when a specific individual or enterprise has sufficient control over a particular product or service to determine significantly the terms on which other individuals shall have access to it."
- "The monopolist has power. It is easy to argue that he should discharge his power not solely to further his own interests but to further socially desirable ends. Yet the widespread application of such a doctrine would destroy a free society."

- “There are three important areas of monopoly requiring separate consideration: monopoly in industry, monopoly in labor, and governmentally produced monopoly.”
- “Concerning industry: the governmentally operated or supervised sector has of course grown greatly over the past half-century or so. Within the private sector, on the other hand, there appears not to have been any tendency for the scope of monopoly to have increased and it may well have decreased.”
- “I am myself inclined to believe that a much shorter period of patent protection would be preferable. “
- “There are three major sources of monopoly: "technical" considerations, direct and indirect governmental assistance, and private collusion.”
- “There is unfortunately no good solution for technical monopoly. There is only a choice among three evils: private unregulated monopoly, private monopoly regulated by the state, and government operation.”
- “Perhaps the three clearest examples of governmentally produced monopoly are tariffs, tax legislation, and law enforcement and legislation with respect to labor disputes.”
- “Collusion or private cartel arrangements are constantly arising. However, they are generally unstable and of brief duration unless they can call government to their assistance.”
- “There is only one social responsibility of business: to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition, without deception or fraud.”
- “The corporation is an instrument of the stockholders who own it. If the corporation makes a contribution, it prevents the individual stockholder from himself deciding how he should dispose of his funds.”
- “With the corporation tax and the deductibility of contributions, stockholders may of course want the corporation to make a gift on their behalf, since this would enable them to make a larger gift. The best solution would be the abolition of the corporate tax.”

Amartya Sen in his *Collective Choice and Social Welfare* (1970) criticized the ontological and methodological individualism and posed the following question: Why are individuals the ultimate authority?

Arthur Ocun in his *Equality and Efficiency: The Big Trade-Off* (1975) posed that following the aim of equality, efficiency can be decreased; “the pie can become smaller “.

More philosophical inputs were presented, e.g., by John Rawls in *A Theory of Justice* (1971), Robert Nozick in *Anarchy, State and Utopia* (1974), Friedrich von Hayek in *The Constitution of Liberty* (1960) and Amartya Sen in *On Economic Inequality* (1973).

It is good to realize that economic thought was since its beginning for centuries linked with ethics, so it seems to be natural that the questions on freedom and justice gain again on momentum.

Summary

In the 1950s, Arrow and Debreu proved two fundamental Welfare Theorems:

- A competitive Walrasian equilibrium, without market failures, is not Pareto-dominated by any feasible social allocation.
- Any desired Paretian allocation can be achieved by appropriately distributing initial endowments, allowing market exchanges to lead to that equilibrium.

These theorems suggest separating efficiency from distributive justice, though practical challenges exist, such as the need for a unique and stable equilibrium.

Market failures as externalities, commons, public goods, or asymmetric information prevent free markets from achieving Pareto efficiency, necessitating different remedies.

Analysis of market failures spurred the development of New Institutional Economics and Public Choice Theory. Public choice investigates government behavior through an economic lens, challenging assumptions of government prioritizing public interest and highlighting inefficiencies.

Arrow's Impossibility Theorem reveals challenges in designing fair voting systems. Wicksell, Buchanan, and others explored how voting and justice intersect with efficiency.

Notable thinkers like Friedman, Sen, Ocun, Rawls, Nozick and von Hayek contributed to realizing the importance of freedom and justice in economic affairs.

Adam Smith

You can find many videos and texts on Adam Asmith on web. For recommended videos, click here, a recommended text is Adam Smith – A Primer from Eamonn Butler.

We have met with Adam Smith many times in previous weeks. Let us remind, e.g.:

1st Week - Self Interest and Public Benefit: "*Adam Smith (1723 – 1790), considered the grounder of modern economics, wrote two basic works:*

- *The Theory of Moral Sentiments (1759)*
- *The Wealth of Nations (1776)*

The Theory of Moral Sentiments examines the foundations of human morality and ethical behavior. Smith posits that moral judgments are rooted in innate human sympathy - the capacity to understand and share the feelings of others. He argues that our sense of right and wrong is influenced by the impartial spectator, an imagined viewpoint that enables objective evaluation of our own and others' actions.

In The Wealth of Nations, Adam Smith emphasizes the importance of self-interest as a driving force for economic activity and societal prosperity. He argues that when individuals pursue their own self-interest, they inadvertently contribute to the overall economic well-being of society through a mechanism he famously describes as the "invisible hand." This principle suggests that individuals seeking to maximize their own gains - such as producers aiming for higher profits or consumers striving for the best value - lead to competitive markets, efficient resource allocation, innovation, and wealth creation. According to Smith, this self-regulating nature of the free-market economy - if accompanied with reasonable institutions - ensures that the pursuit of personal gain translates into collective benefits, fostering economic growth and development."

2nd Week – Ideas on Property Rights from Classical Antiquity to Modern Time: "*Adam Smith (1723-1790) was a seminal Scottish economist and philosopher, often hailed as the "Father of Economics". Concerning property rights, in The Wealth of Nations (1776) he follows the natural law tradition but states that the right to property is not self-evident. Only through an agreement could the physical act of taking become the moral act*

of owning – rights are meaningful in a social setting only. In the Lectures on Justice, Police, Revenue and Arms (1763) he follows the Romal law tradition and specifies that property comes legitimately into one´s possession through:

- *Occupation: Similar to John Locke.*
- *Tradition: Through a voluntary transfer from a previous owner.*
- *Accession: The owner of a thing owns not only the thing but also everything it produces (e.g. an apple tree and an apple).*
- *Prescription: Property right emerges with long possession even if the original claim was an invalid one.*
- *Succession.: Through inheritance."*

Why is Adam Smith Important?

- Smith revolutionary changed the old mercantilist view of economics,
- He stressed that in a free exchange both sides are better off,
- He defined the wealth of a nation as the total of its production and commerce,
- He posed that the maintenance of a good social order does not need the continues supervision of government,
- He believed that freedom and self-interest need not lead to chaos,
- He understood human beings as complex creatures that have a natural sympathy for others that enables them to moderate their following of self-interest and preserve harmony.

Life

- Born in Kirkaldy (Scotland) in 1723, we do not know the exact day,
- In 1737, he started to attend the local university in Glasgow, where he studied Greek lectures, logic, natural philosophy, mathematics, physics, and moral philosophy,
- 1740 – 1746: He studied in Oxford, he was punished when caught reading the

Treatise of Human Nature written by David Hume,

- 1746 -1748: He studied in Kirkaldy on his own,
- 1748 – 1751: He was public lecturer in Edinburgh on rhetoric and English literature,
- 1751 – 1764: He was professor at Glasgow University, he held the chair of logic and later the chair of moral philosophy,
- 1764 - 1767: He was tutor to a young nobleman and travelled on the continent,
- 1767 - 1773: He lived in Kirkaldy with his mother and worked on *The Wealth of Nation*s,
- 1973 - 1778: He lived in London to follow printing of his book,
- In 1777: He wrote about the life of David Hume,
- In 1778: He wrote a memorandum on the American situation, arguing for a uniform system of taxation for Great Britain, Ireland, and the American colonies,
- 1778 - 1790: He lived in Edinburg and worked as Commissioner of Customs for Scotland,
- In 1784: His mother passed away,
- After his death in 1780, with respect to his instructions, 16 volumes of manuscripts were destroyed.

Method

On epistemology (what is knowledge) and methodology (how do we get knowledge), Smith wrote in *The principles that lead and direct philosophical enquiries; illustrated by the history of astronomy* (1754). According to him, philosophers are driven by three sentiments:

- Wonder: They are excited by what is new and singular,
- Surprise: They are excited by what is unexpected,
- Admiration: They are excited by what is great or beautiful.

Philosophical systems are mere inventions of the imagination. They serve to connect together in mind the otherwise disjointed phenomena of nature. Philosophers create, rather than discover. There does not exist any mathematical structure intrinsic to reality.

Another source on his methodology are his *Lectures on Rhetoric*, written down by some of his students in 1772-1773 and found in 1958. Here, Smith proposed the method of rhetoric as the way to select the propositions to be accepted and those to be rejected. An impartial spectator is assigned the role of the arbiter of what is – provisionally, not absolutely – true or false.

The Theory of Moral Sentiments (1759)

In this book, Smith develops the Moral Principle of Sympathy and the notion of an impartial spectator. He writes:

- "Sympathy, namely the ability to share the feelings of others, leads us to judge our actions on the basis of their effects on others in addition to their effects on ourselves."
- „Individuals evaluate their own actions by taking the viewpoint of an impartial spectator who, endowed with the knowledge of all the elements they know, judges such actions as an average citizen. "

On the relation between private and public interest he writes:

- "The distinction between private and public interest becomes an irreconcilable conflict only if the private interest is interpreted as selfishness rather than self – interest."

He identifies four elements to guarantee the development of civilized societies:

- Moral behavior based on the sentiment of sympathy,
- The driving force of personal interest,
- A set of juridical rules and customs,
- Public institutions designed among other things to guarantee the administration of justice.

The Wealth of Nations (1776)

- The full name is *An Inquiry into the Nature and Causes of the Wealth of Nations*.
- Structure:
    - Book 1 concerns: The division of labor and the theory of value and income distribution,
    - Book 2 concerns: Money and accumulation,
    - Book 3 concerns: History of institutions and economic history since the fall of Roman empire,
    - Book 4 concerns: Criticism of mercantilists and physiocrats,
    - Book 5 concerns: Public expenses and receipts and the role of state in the economy.
- Key points:
    - The wealth of nations is identified with what we today call the national product,
    - National product is given by labor productivity times the number of productive workers,
    - Productivity depends on the division of labor and the latter depends on the size of the markets,
    - The share of productive workers in the total population depends on the stage reached by the process of accumulation, explicitly:
        - On the amount of means of production available to give work to new productive workers,
        - On institutional elements.

    - Natural price is the theoretical price that expresses the conditions of reproduction of the productive process. It must cover production costs and guarantee a standard rate of profit. He writes: “The whole annual produce . . . of every country . . . naturally divides itself . . . into three parts; the rent of land, the wages of labor, and the profits of stock; and constitutes a revenue to three different orders of people; to those who live by rent, to those who

live by wages, and to those who live by profit. These are the three great, original and constituent orders of every civilized country. “

- Market price of every particular commodity is regulated by the proportion between the quantity which is actually brought to the market and the demand of those who are willing to pay the natural price of the commodity, namely effectual demand.
- Smith supports laws on primary public education for all and is against child labor.

Miscellaneous

- Smith writes: “The division of labor is the necessary, though very slow and gradual consequence of a certain propensity, the propensity to barter and exchange one thing for another.” This Smith´s attitude has been discussed; the division of labor might be a consequence of different innate abilities of people. Smith explicitly denied that people might have different innate abilities.
- After the French revolution, Smith´s liberalism became too suspicious. Acceptability was re-gained with the re-interpretation of his liberalism as an economic liberalism, not as political liberalism. Chinese political dictatorship and economic liberalism could be linked with Adam Smith in this way.