HISTORY OF ECONOMIC THOUGHT

Lecture Notes for Week 4

Tomáš Cahlík

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Modern Time – Basic Milestones

Let us start this chapter with a short summary of some topics from the philosophy of science that allow us to understand how is it possible that we can have more parallel economic theories:

- **Verification of economic theories**: Sciences use the method of induction to derive theories from observations or experiments and verify these theories with additional observations or experiments. Successful predictions are crucial for verification, and successful technologies embody successful predictions. However, verifying economic theories using facts is less conclusive due to causal complications. J.S. Mill (1806–1873) suggested a two – stage modification of induction more suited for social sciences: distinguishing between a posteriori and a priori induction. Induction a posteriori explains facts with a limited number of causal factors. Induction a priori deductively investigates the combined effects of facts explained a posteriori. The same set of facts explained a posteriori may support multiple theories.
- **Instrumentalism in economics**: Milton Friedman (1912–2006) argued in his 1953 essay *The Methodology of Positive Economics* that theories and models are tools for prediction, not understanding. A theory should be judged by its predictive power for the class of phenomena it seeks to explain. Unrealistic assumptions are not problematic if they lead to accurate predictions.
- **Falsificationism**: In the early Enlightenment, there was a belief in the linear development of science through induction from empirical facts and verification via successful predictions. Karl Popper (1902–1994) developed Falsificationism, which is based on the idea that "absolute" verification is impossible. A theory is considered true as long as it has not been falsified. Theories that cannot be falsified are not scientific. Instead of verifying, we should attempt to falsify, which is a key part of the scientific process.
- **Economic theories as structures**:
    - Thomas Kuhn (1922–1996) introduced the concept of "paradigm shifts" in his 1962 book *The Structure of Scientific Revolutions*. A paradigm is a

widely accepted framework that defines scientific research within a field, including theories, methods, standards, and assumptions. Scientific fields progress not only through linear development but also through paradigm shifts, where new discoveries challenge existing frameworks and open new approaches. The notion of scientific truth at any given time is determined by a consensus within the scientific community. In economics, we use the term revolution in the context of the Marginalist Revolution in 1870ies, the Keynesian Revolution following the publication of Keynes´s *General Theory* and the Monetary Counterrevolution that is linked especially with Milton Friedmann.

- Imre Lakatos (1922–1974) developed the concept of "research programs" to reconcile the perceived conflict between Popper's Falsificationism and Kuhn's "revolutionary" structure of science. Lakatos's research programs consist of a "hard core" of fundamental assumptions protected by a "protective belt" of auxiliary hypotheses. Progress is judged by a program's ability to predict novel facts and expand explanatory power over time, distinguishing between "progressive" and "degenerative" programs. Examples of research programs in economics include the Neoclassical Synthesis (mainstream), Post-Keynesian Economics, Austrian Economics, Public Economics, International Economics, and Economic Growth Theories.

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During the 19th century, capitalism underwent significant transformation, driven by rapid industrialization and the rise of large firms. Technological advances, such as railways and telecommunications, facilitated industrial growth, leading to the emergence of big firms like Standard Oil and Krupp. These enterprises benefited from economies of scale and adopted corporate structures like limited liability, enabling further expansion.

Simultaneously, European powers accelerated their colonial pursuits, especially in Africa, motivated by the need for raw materials and new markets. Colonies were exploited for resources and served as markets for manufactured goods, with infrastructure developed primarily to support these goals. This period saw heightened global trade but also deepened

economic disparities, both within industrialized nations and between them and their colonies.

Amidst this capitalist growth, labor movements began to form in response to poor working conditions, advocating for improved wages and rights. Thus, the era marked the intertwining of industrial expansion, colonial exploitation, and significant socio-economic changes that laid the foundation for modern capitalism.

In the first half of the 19th century, classical political economy was disintegrated. The Ricardians expanded upon Ricardo's ideas. Important figures were James Mill, and later his son John Stuart Mill. The Ricardian Socialists were a group of thinkers who built upon the economic theories of David Ricardo to argue for social reform and critique capitalism. While Ricardo himself was not a socialist, these thinkers took his labor theory of value and theories on distribution and used them to highlight the inequalities and injustices they perceived in the capitalist system. The anti-Ricardians were economists and thinkers who opposed or critiqued the economic theories of David Ricardo and his followers. They were of different types, let us stress those that realized the danger coming from the socialist elaboration of the labor theory of value. These thinkers stressed that classes have in principle the same interest and that capitalism can develop harmoniously. Frédéric Bastiat, a 19th-century French economist and writer, can be given as an example.

Classical economists concentrated on the elaboration of macroeconomic ideas of Adam Smith: the creation of surplus and accumulation of capital. Other thinkers, especially on the Continent, where the influence of David Ricardo was weaker, elaborated the microeconomic ideas of Adam Smith and can be considered as predecessor of the marginalist revolution in the second half of the 19th century.

Augustin Cournot, the French mathematician and economist introduced in his seminal work, *Recherches sur les Principes Mathématiques de la Théorie des Richesses (Researches into the Mathematical Principles of the Theory of Wealth*) (1838) the concept of oligopoly, analyzing the behavior of firms in a market where several suppliers influence prices. He was one of the first to systematically apply mathematical techniques to economics. Among other things, he articulated the law of demand in mathematical terms, demonstrating the inverse relationship between price and quantity demanded. This concept is

foundational in current economic theory. Cournot influenced many later economists, including Léon Walras, who developed the theory of general equilibrium.

Jules Dupuit, the French engineer and economist, articulated in his paper titled *De la mesure de l'utilité des travaux publics (On the Measurement of the Utility of Public Works)* (1844) the concept of consumer surplus, which represents the difference between what consumers are willing to pay for a good and what they actually pay. He was probably the first one who used the Supply – Demand diagram.

Hermann Heinrich Gossen, the German economist, formulated in *The Laws of Human Relations and the Rules of Human Action Derived Therefrom* (1854) the law of diminishing marginal utility, which states that as more of a good is consumed, the additional satisfaction gained decreases. Today, we call this the First Gossen´s Law. According to the Second Gossen´s Law, outlined in the same paper, consumers allocate their resources in a way that equalizes the marginal utility per unit of currency spent across all goods and services.

The Old German Historical School was a significant 19th-century economic movement in Germany that marked a departure from the abstract models of classical economics. Instead, it focused on understanding economic phenomena through historical context, empirical research, and a multidisciplinary approach. It integrated insights from various disciplines such as sociology, history, and law, to offer a more comprehensive understanding of economic systems. Key figures included Wilhelm Roscher (1817- 1894), Bruno Hildebrand (1812 – 1878), and Karl Knies (1821 – 1898). This School played a foundational role in the development of institutional economics and economic history, influencing later thinkers like Max Weber.

Friedrich List, a notable 19th-century German economist, is best known for his advocacy of economic nationalism and his challenges to classical free trade theories. In his influential work *The National System of Political Economy* (1841) List argued that developing nations should protect their emerging industries with tariffs to allow them to grow and become competitive. This concept, known as the "infant industry" argument, posits that young industries need temporary shielding from international competition. List also proposed that nations progress through economic stages, from agriculture to manufacturing and to an industrial economy, emphasizing the importance of industrialization for national

prosperity. Often regarded as the father of economic nationalism, List's ideas significantly influenced the economic policies of countries like the United States and Germany during their industrialization periods. While debated over time, his focus on the strategic development of national industries remains relevant in modern discussions on trade policy and economic development.

John Suart Mill

John Stuart Mill (1806–1873) was a British philosopher, political economist, and civil servant. He worked for the East India Company office between 1823 and 1857), but is mostly known for his significant contributions to a range of fields, including philosophy, economics, and political theory. In economics, he makes a bridge between the classical political economy and the neoclassical economics which development started after the marginalist revolution.

- Key Contributions:
    - Advocacy for Social Reforms: Mill was a progressive thinker who supported several social reforms, including women's rights and education. His work *The Subjection of Women* (1869) advocated for gender equality and women's suffrage. He supported also the anti – slavery and anti – racist movements and the birth control.
    - Utilitarianism: Mill was a major proponent of utilitarianism. In his work *Utilitarianism* (1863), Mill refined the Bentham´s theory by distinguishing between higher and lower pleasures, emphasizing qualitative differences in happiness.
    - Advocacy for Liberty and Individual Freedom: Mill's essay *On Liberty* (1859) is a foundational text in liberal political philosophy. He argued for the protection of individual freedoms against societal and governmental encroachment, asserting the importance of free speech and expression. His "harm principle" states that individuals should be free to act as they wish, provided their actions do not harm others.
    - Political Economy: In his seminal work *Principles of Political Economy with Some of Their Applications to Social Philosophy* (1848), Mill integrated

classical economic thought with social philosophy. It was used as a basic textbook in the Anglo-Saxonian world almost until the end of the 19th century. It is structured into five books: production, distribution, exchange, economic development, and the role of government. Mill broadly used statistical data for supporting his analyses.

- Some of Mill´s opinions from Book V (On the influence of government), Chapters V, VI:
  - "It is an excellent maxim to make present resources suffice for present wants."
  - "The basic way of extinguishing or reducing a national debt, is by means of a surplus revenue."
  - "Any casual gain, or god-sent gain of the nation, is naturally devoted to reducing a national debt."
  - "There are cases in which it is not desirable to maintain a surplus revenue for the redemption of Debt."
  - "The doctrine of Protection to Native Industry is false."
  - "The doctrine of Protection to Native Industry is supported by pleas of national subsistence and defense."
  - "Protecting duties can be temporarily used for naturalizing a foreign industry."
  - "The policy compelling colonies to trade exclusively with the dominant country is bad."
- The wage-fund theory posits that employers have a set amount of capital, or a "fund," out of which they can pay wages to workers. Based on the theory, the level of wages is then determined by the size of this wage fund and the number of laborers. The larger the fund and the smaller the number of workers, the higher wages would be, and vice versa. Mill used this theory in his *Principles* but abandoned it in an article in 1869. When he used this theory, he suggested to his trade union friends less revolution and more contraception.
- Mill differed from Ricardo in the theory of value. For Ricardo, profit and interest were part of the surplus. For Mill, profit and interest were costs. Mill used

the Abstinence Theory of Interest. This theory proposes that the interest charged on capital loans is a form of reward for the lender abstaining from current consumption. In other words, it compensates the lender for the sacrifices made by not using their capital immediately for consumption purposes, and instead making it available for productive purposes.

- Secular stagnation: Mill believed that economies would reach a 'stationary state' when they exhaust their ability to convert land and other natural resources into capital. Once in this stationary state, he considered economies would experience zero growth. However, Mill did not view this as necessarily negative; he saw potential benefits such as potentially increasing happiness and quality of life and better distribution of wealth.
    - The term 'secular stagnation' itself, however, was coined much later by the American Keynesian economist Alvin Hansen (1887–1975) in the 1930s. The term is used to describe a prolonged period of slow economic growth or stagnation, potentially indefinitely.

Marginalist Revolution

The Marginalist Revolution, occurring in the second half of the 19th century, was a fundamental shift in economic thought that changed the classical political economy to the neoclassical economics. Key figures of the Marginalist Revolution include William Stanley Jevons, Carl Menger, and Léon Walras. Their seminal books were published in 1870ies.

Let us start with the comparison of the classical system with the neoclassical system:

- Classical political economy develops the “macroeconomic” ideas of Adam Smith. Central question is the accumulation of capital as the basic condition for the increase of the wealth of nations. Neoclassical economics is centered around the analysis of the allocation of given resources among alternative uses. It develops the “microeconomic” ideas of Adam Smith.

- Classical economist used the objective theory of value, basically for the explanation of the distribution of income. Neoclassical economists shifted to the subjective theory of value based on utility. Marginal utility becomes the basis for the explanation of allocations. Neoclassical economists work with the substitution principle which refers to the concept that consumers or firms will substitute goods or resources to maximize their of utility or output.
- Classical political economists understood their theories as explaining the capitalist system with its three classes: capitalists, workers and landlords. Neoclassical economists believe that economic laws are ahistorical. They use optimizing behavior of individuals for their explanations. This approach is called methodological individualism and contrasts with the methodological holism of classical political economists, which do not use individuals for their explanations but classes.

Neoclassical concepts are the basis of current microeconomics, what Figures 4–1 and 4-2, that are currently used in the introductions to microeconomics, demonstrate:

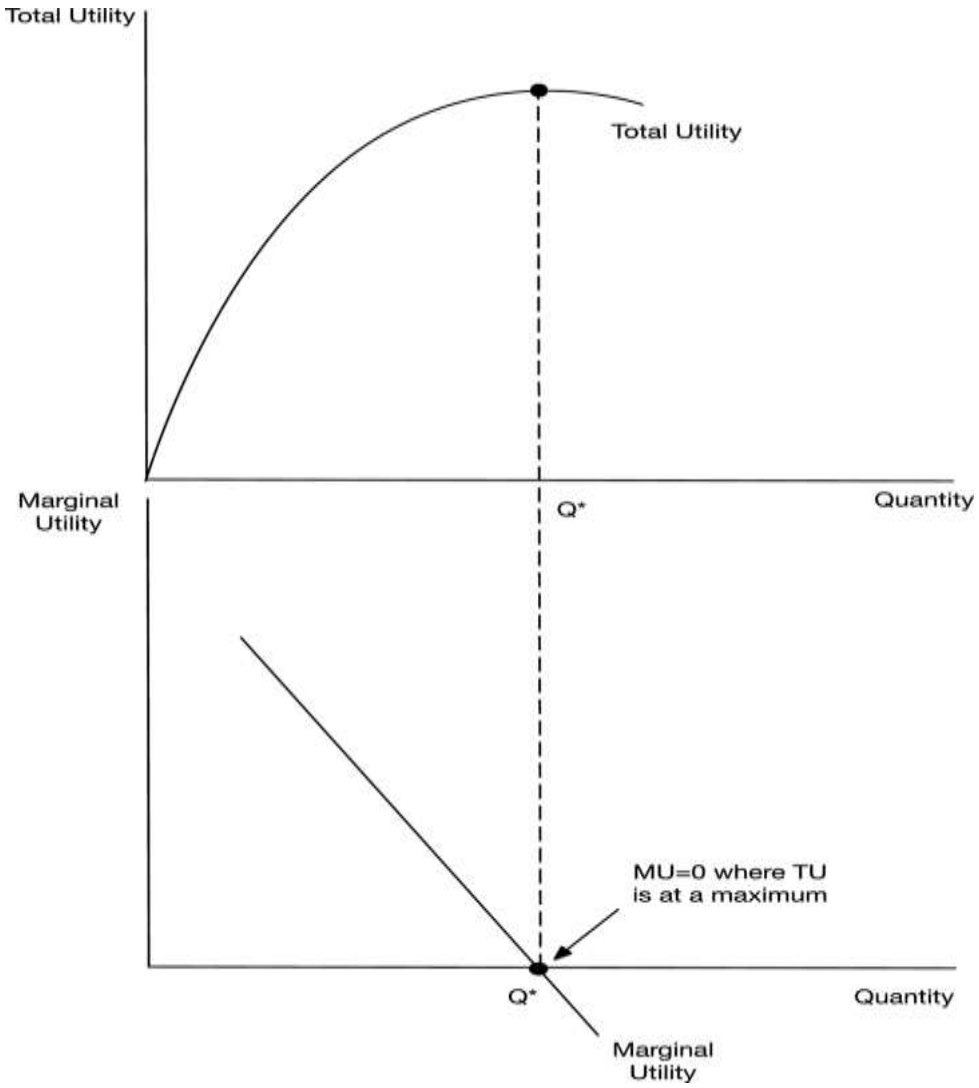

Figure 4-1: Total and marginal utility

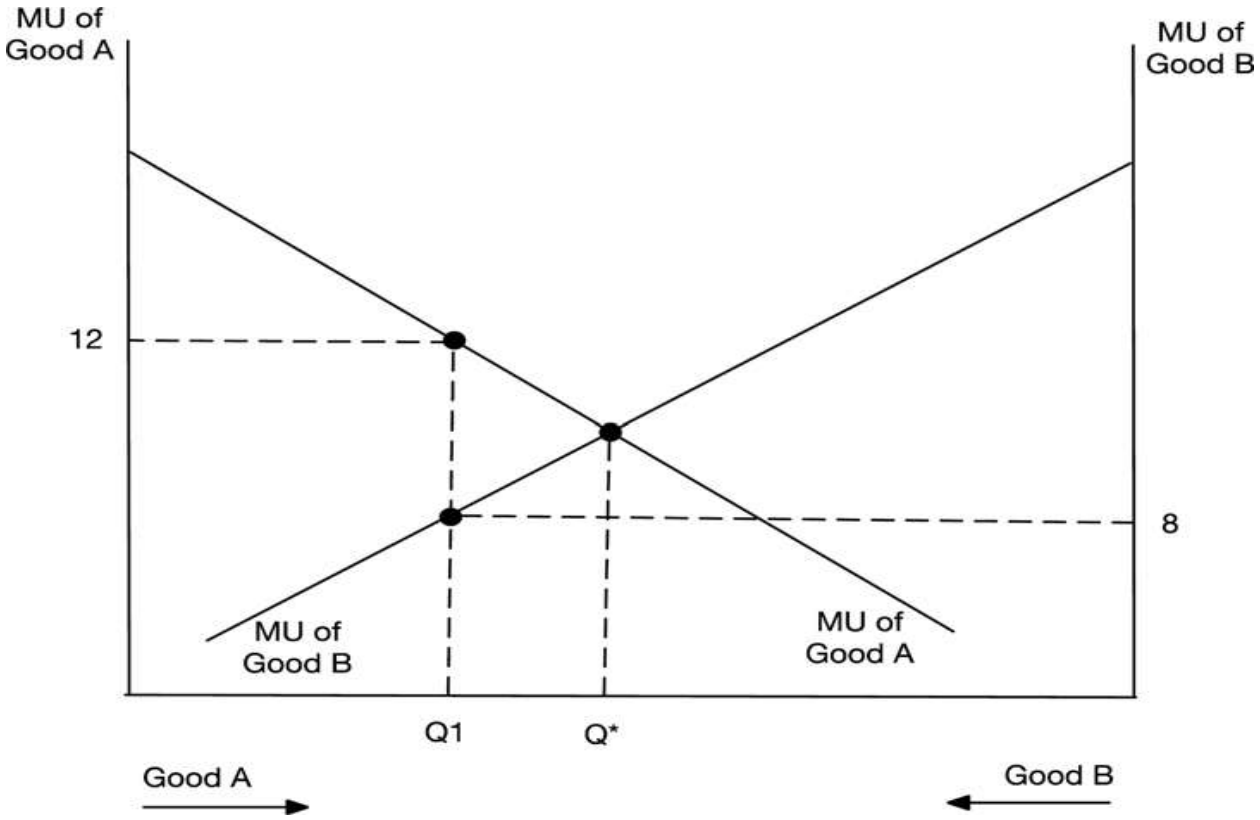

Figure 4-2: Substitution principle

William Stanley Jevons (1835 – 1882), originally a chemist, was an influential British economist and logician. He was professor of political economy at the University College in London between 1876 and 1880. In 1882 he drowned during a seaside holiday.

His *The Coal Question* (1865) explores the sustainability of Britain's reliance on coal during the Industrial Revolution. Jevons raised concerns about the economic implications of finite coal resources, predicting that as accessible reserves dwindled, extracting coal would become more difficult and expensive, potentially slowing industrial growth. A critical insight from his work, later termed the Jevons Paradox, suggests that improvements in energy efficiency could paradoxically lead to increased overall consumption, as lower costs stimulate demand.

Jevons is best known for his work on the theory of marginal utility, which he detailed in his book *The Theory of Political Economy.* (1871) In this work:

- He used mathematics for the elaboration of his economic ideas.
- He used the subjective theory of value,
- He quantified utility as a one-dimensional continuous variable – product of intensity and duration of pleasure and pain,
- He developed the theory of consumer choice, where the marginal utility of goods is balanced with the marginal disutility of labor.

Let us cite from this work:

„Exchange is so important a process in the maximizing of utility . . . that some economists have regarded their science as treating of this operation alone . . . . I am perfectly willing to agree with the high importance attributed to exchange. It is impossible to have a correct idea of the science of economics without a perfect comprehension of the theory of exchange."

Beyond economics, Jevons also made notable contributions to the field of logic, particularly with his work on the development of formal logic and decision-making processes. His book *The Principles of Science* (1874) addressed the scientific method and probability theory.

Carl Menger (1840 – 1921), was a prominent economist, born in Neu Sandez, Galicia, in the Austrian Empire (now Nowy Sącz, Poland). He studied law at the universities in Vienna, Prague and Cracow. Between 1876 and 1878 he was tutor to the Crown Prince Rudolf of Austria. Between 1878 and 1903 he was professor of political economy at the University of Vienna. He is considered the grounder of the Austrian Economic School.

Menger built upon the German universities' tradition, where the most utilized textbook was from Wilhelm Roscher (26 editions from 1854 to 1922), a prominent economist of the German Historical School. His aim was to transcend simple description of economic phenomena. In contrast with both Jevons and Walras, he was distant from the project to construct economic theory as a mathematical science.

Menger's most renowned contribution to economics is his book *Principles of Economics (Grundsätze der Volkswirtschaftslehre)* (1971), dedicated to Wilhelm Roscher, which offers following ideas:

- Economic activity is a search for knowledge and power.

- Goods are of different order. Goods of the first order are consumer goods or final goods that directly satisfy human needs or wants. They are ready for consumption without any further transformation. Examples include food, clothing, and household items. These goods derive their value directly from the utility they provide to consumers when used or consumed. Goods of a higher order are production goods, also known as capital goods or intermediate goods. They do not directly satisfy human needs but are used in the production process to create goods of a lower order, ultimately leading to consumer goods. Goods of a higher order include raw materials, machinery, tools, and equipment. They derive their value from their ability to produce goods of a lower order, which eventually satisfy consumer demands.
- Consumption goods (goods of the first order) have value in use for satisfaction of needs. Scarcity determines how needs are satisfied at the margin, as is illustrated in the Menger scales (Figure 4-3). Needs are ordered from I to X according to their importance. Goods are used for needs´ satisfaction but the marginal utility decreases from 10 to 0. Hint how to use the Menger scale: Instead of putting the third unit of goods into the need I, it is better to put it into the first unit of need II. We assume homogeneous goods that can satisfy all needs.

I	II	III	IV	V	VI	VII	VIII	IX	X
10	9	8	7	6	5	4	3	2	1
9	8	7	6	5	4	3	2	1	0
8	7	6	5	4	3	2	1	0	
7	6	5	4	3	2	1	0		
6	5	4	3	2	1	0			
5	4	3	2	1	0				
4	3	2	1	0					
3	2	1	0						
2	1	0							
1	0								
0									

Figure 4-3: Menger Scales

- The value of a good is ultimately linked to its ability to satisfy consumer needs directly or indirectly. Value is imputed to the production goods (goods of higher orders) from the consumer goods (goods of the first order) and the value of consumer goods is directly linked to its marginal utility. Let us cite: "Assuming in each instance that all available goods of a higher order are employed in the most economic fashion, the value of a concrete quantity of a good of higher order is equal to the difference in importance between the satisfactions that can be attained when we have command of the given quantity of the good of higher order whose value we wish to determine and the satisfactions that would be attained if we did not have this quantity at our command ."

The First Struggle on Method (Methodenstreit) was a significant intellectual debate in the late 19th century between the Austrian Economic School and the Young German Historical School of Economics, notably Gustav von Schmoller. This debate centered around the appropriate methodology for economic research. The debate started with Menger´s *Investigations into the Method of the Social Sciences with Special Reference to Economics* (1893) and got in strength with his *Irrthummer des Historismus in der Deutschen*

Nationaloekonomie (1895).

Menger, representing the Austrian School, advocated for a theoretical and abstract approach to economics, emphasizing universal laws derived through logical reasoning and the study of individual human actions. He believed that economic principles could be deduced from a priori reasoning and that these principles were applicable universally, irrespective of historical context.

In contrast, the German Historical School, led by Gustav von Schmoller, argued for an empirical and historical approach. They emphasized the importance of inductive reasoning and contended that economic phenomena were too dependent on specific historical and cultural contexts to be explained by universally applicable laws.

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.

Keynesian Revolution

The Keynesian Revolution got an impetus from the Great Depression between the World Wars. It refers to a paradigm shift in economic thought that began in the 1930s, following the publication of John Maynard Keynes's seminal work, *The General Theory of Employment, Interest, and Money* in 1936. This paradigm shift significantly altered the

approach to economic policy and theory and shifted attention of economists to macroeconomic problems, particularly in addressing issues of unemployment and economic instability.

- Basic differences from the neoclassical approach:
  - **Markets are not Self-correcting; Government Intervention is Necessary**: Keynes challenged the neoclassical economic view that markets are self-correcting and advocated for active government intervention to stabilize the economy. He suggested that during economic downturns, governments should increase spending and cut taxes to boost demand and pull the economy out of recession. He preferred the fiscal policy.
  - **Aggregate Demand**: Keynes emphasized the importance of total demand in the economy (consumption, investment, government spending, and net exports) as the primary driver of economic activity and employment levels. He argued that insufficient aggregate demand could lead to prolonged periods of high unemployment. The Say´s Law of Markets does not hold in the short run.
  - **Short-run Focus**: While neoclassical economics focused on the long-run equilibrium, Keynes introduced a short-run perspective, arguing that during periods of low demand, wages and prices are sticky (inflexible) and do not adjust quickly enough to restore full employment. His attitude was that "in the long run we are all dead."

Monetarist Counterrevolution

Monetarism is an economic theory that emerged as a response to Keynesianism. It gained attraction during periods of high inflation and economic stagnation in the 1970s, when traditional Keynesian policies seemed less effective. Monetarism offered such a significant shift from Keynesian ideas that it can be considered as a scientific counterrevolution.

Developed and popularized by the American economist and libertarian Milton Friedman, monetarism emphasizes controlling the amount of money in circulation as the primary method of managing the economy, rather than using fiscal policy to influence

demand as Keynesians prefer. Monetarists argue that variations in the money supply have major influences on national output in the short run and the price level over longer periods. Unlike Keynesianism, which advocates for discretionary fiscal policy interventions, monetarism stresses the importance of rule-based monetary policy geared toward controlling inflation. Monetarists contend that excessive government intervention can lead to inefficiencies and inflationary pressures.

Summary

Verification in economics is complex due to causality, leading J.S. Mill to propose a two-stage induction method that allows for different theories to explain the same facts. Milton Friedman's instrumentalism suggests that theories are tools for prediction, judged by their accuracy rather than realism. Karl Popper's Falsificationism emphasizes testing theories by attempting to falsify them.

Thomas Kuhn's "paradigm shifts" describe how scientific progress involves shifts in accepted frameworks, seen in economics through events like the Marginalist, Keynesian, and Monetary revolutions. Imre Lakatos's "research programs" idea reconciles Kuhn and Popper, assessing progress by a program's ability to predict new facts and expand its explanatory range.

In the 19th century, capitalism transformed significantly due to rapid industrialization and the rise of large corporations. Technological advancements, such as railways and telecommunications, supported industrial growth and the emergence of powerful firms like Standard Oil and Krupp, which leveraged economies of scale and corporate structures like limited liability for expansion. European nations intensified colonial efforts, particularly in Africa, driven by the need for raw materials and new markets, exploiting colonies and developing infrastructure to serve these aims. This era experienced increased global trade but also heightened economic inequalities both within industrialized countries and between them and their colonies. Concurrently, labor movements emerged, advocating for better wages and working conditions. This period marked the confluence of industrial progress, colonial exploitation, and socio-economic shifts, laying the groundwork for modern capitalism.

In the early 19th century, classical political economy split into various streams. Ricardians like James Mill expanded on David Ricardo's ideas, while Ricardian Socialists critiqued capitalism using his labor theory of value. Meanwhile, anti-Ricardians, including Frédéric Bastiat, argued against socialist interpretations and supported the idea of harmonious capitalism.

Some economists focused on microeconomic theories, laying the groundwork for the later marginalist revolution. Augustin Cournot introduced oligopoly concepts and mathematical economics, influencing Léon Walras. Jules Dupuit developed consumer surplus, and Hermann Heinrich Gossen articulated the laws of diminishing marginal utility.

The Old German Historical School, including Wilhelm Roscher and Karl Knies, emphasized historical and empirical analyses of economics, and influenced thinkers like Max Weber. Friedrich List promoted economic nationalism, advocating for protecting emerging industries with tariffs and emphasizing industrialization for national prosperity. His ideas on the "infant industry" argument have influenced economic policies and remain relevant in trade discussions today.

John Stuart Mill (1806–1873) was a British philosopher, economist, and civil servant who played a pivotal role in advancing both classical and neoclassical economics. He was a strong advocate for social reforms, championing causes such as women's rights and education, as seen in *The Subjection of Women* (1869). Mill refined utilitarianism by differentiating between higher and lower pleasures in *Utilitarianism* (1863) and advocated for individual freedoms in his seminal essay *On Liberty* (1859), promoting the "harm principle."

In economics, his *Principles of Political Economy* (1848) integrated classical thought with social philosophy, addressing production, distribution, and government roles. While initially supporting the wage-fund theory to explain wages, he later rejected it. Unlike Ricardo, who saw profit and interest as surplus, Mill treated them as costs He used the Abstinence Theory of Interest.

Mill also foresaw a 'stationary state' in economies once natural resources were fully utilized, which he believed could enhance the quality of life. This idea of zero growth was later expanded into the concept of 'secular stagnation' by economist Alvin Hansen.

The Marginalist Revolution in the late 19th century marked a major shift from classical political economy to neoclassical economics, led by key figures like William Stanley Jevons, Carl Menger, and Léon Walras.

Jevons, originally a chemist, introduced the theory of marginal utility in *The Theory of Political Economy* (1871), using mathematics to quantify utility and explore consumer choice.

Menger, the founding figure of the Austrian School, authored *Principles of Economics* (1871), which differentiated between goods of varying orders and linked value to consumer needs and marginal utility. His approach emphasized theoretical deductions over historical context, sparking the "Methodenstreit" debate with the German Historical School.

Walras developed the concept of general equilibrium in *Elements of Pure Economics* (1874), using mathematical models to explain how markets interact to determine prices. His work established the foundations for the General Equilibrium Theory.

The Marginalist Revolution shifted focus from classical macroeconomic ideas of capital accumulation to neoclassical principles of resource allocation and subjective value, forming the basis of contemporary microeconomics.

The Keynesian Revolution, triggered by John Maynard Keynes's 1936 publication *The General Theory of Employment, Interest, and Money,* marked a significant shift in economic thought. It emphasized the need for government intervention, advocating for increased spending and tax cuts during downturns to boost demand and address unemployment. Unlike the long-run focus of neoclassical economics, Keynes highlighted the importance of a short-run perspective, arguing that prices and wages are inflexible and need prompt adjustment to restore full employment.

Monetarism, developed by Milton Friedman, gained attraction during the high inflation and stagnation of the 1970s. It marked a significant departure from Keynesian ideas, representing a counterrevolution in economic thought.

It focuses on controlling the money supply as the main economic management tool, contrasting with Keynesian reliance on fiscal policy to influence demand. Monetarists argue that money supply variations significantly impact national output in the short term and price levels over the long term. They advocate for rule-based monetary policy to control inflation, warning that excessive intervention can cause inefficiencie

Economies as Systems

William Petty, Richard Cantillon and Francois Quesnay approached economies as systems. For medicine doctors Petty and Quesnay was the systemic approach quite natural: human body is a system as well as an economy. Petty wrote about “body politick” and considered money as fat that gives energy to the body. Cantillon used three different definitions of sectors in an economy and verbally described the flows among sectors. Quesnay was the first economist who presented the links and flows among sectors with the use of a table. Nowadays, the flows among sectors are approached in the System of National Account and in the Input-Output analysis.

The System of National Accounts

The System of National Accounts (SNA) is an internationally recognized framework for collecting, compiling, and presenting economic data. It provides a comprehensive and standardized set of accounts that enable economists and policymakers to analyze the economic activities of a country. The SNA offers a systematic way of measuring national economic performance and guides international comparisons. The most recent version, the 2008 SNA, provides updated guidelines to reflect modern economic realities, and it is maintained by several international organizations, including the United Nations, the International Monetary Fund, the World Bank, the Organization for Economic Co-operation and Development (OECD), and the European Commission.

The American economist Simon Kuznets (1901 – 1985) laid the foundation for modern national income accounting. After immigrating form Russia to the United States in 1922, he studied at Columbia University, earning his Ph.D. there in 1926. Kuznets' research at the National Bureau of Economic Research focused on empirical studies of economic growth and national income, which became crucial during the Great Depression and World War II, when he also worked with U.S. government agencies. He was awarded the Nobel Prize in Economic Sciences in 1971 for his insights into economic growth and his

foundational work on the measurement of GDP.

The principle of the SNA can be explained with the help of the circular diagram in Figure 4-4.

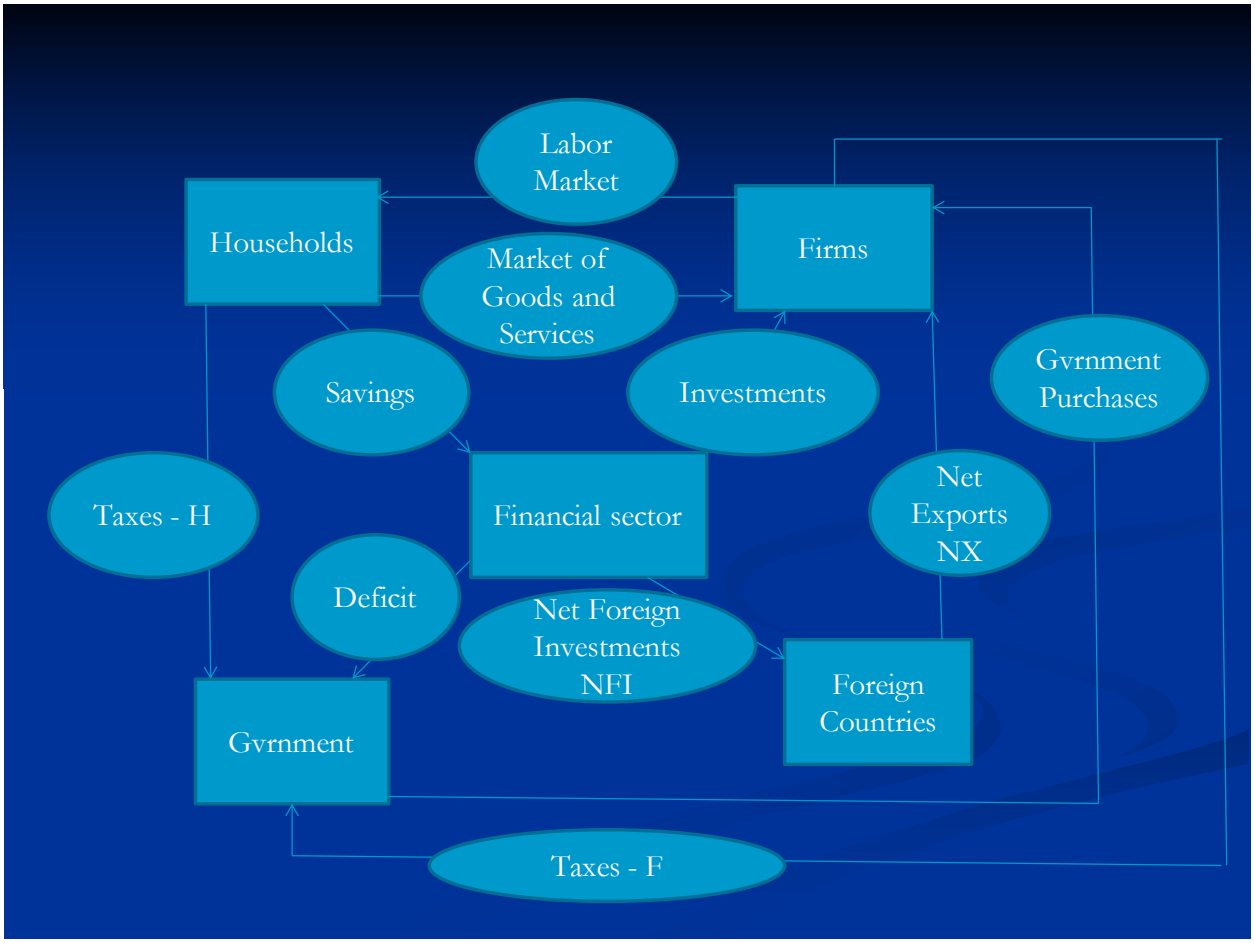

Figure 4-4: Circular Flow Diagram

In this circular flow diagram, there are flows among five sectors: households, firms, the financial sector, the government, and foreign countries. These sectors are connected by different flows. Both households and firms pay taxes to the government. The government purchases goods and services from firms and can finance any deficit through the financial sector. Households buy goods and services from firms and sell their labor in the labor market. What they save is kept in the financial sector. Firms export goods and import from foreign countries; foreign countries finance our net exports with our net foreign

investments. Firms can borrow for investments in the financial sector. The financial sector is the "heart" of the entire system that "pumps" savings to where they are needed.

This circular flow is model of an economic system: it is a set of interacting or interdependent components - sectors - forming an integrated whole.

We can present this system in the form of T-accounts (Figure 4 -5).

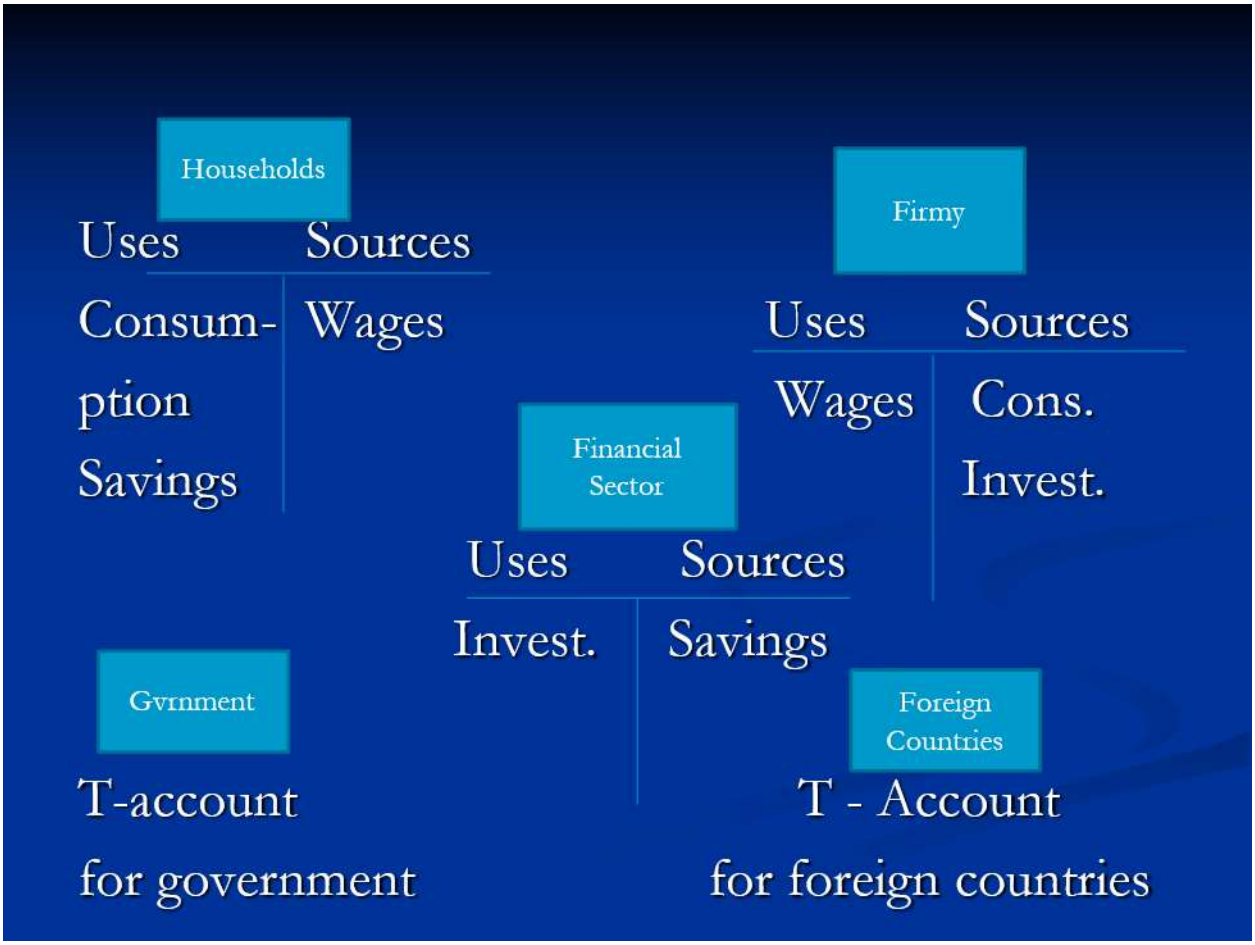

Figure 4-5: System of Accounts.

Each sector in the circular flow diagram has its own T-account. For example, households' sources are wages they receive from firms. All links in the circular diagram have two ends, so they must appear in two T-accounts. Wages are recorded under uses in the firms' T-account. Households use their sources for consumption and savings. Payments for

consumption are among the sources for firms, and savings enter the financial system as a source.

T-account for government is the state budget ex post and T-account for foreign countries is the balance of payments.

The SNA has changed its structure but the principle does not change. Important is the use of double entry for each flow. The history of double-entry accounting traces back to the late medieval period in Italy, where it began to develop among merchants in busy trade centers. It was formalized and popularized by Luca Pacioli in *Summa de Arithmetica* (1494). The system spread throughout Europe as trade expanded during the Renaissance. It was embraced by merchants and businesses for its precision in tracking financial transactions. Its adoption was crucial in the evolution of modern capitalism and the coordination of complex business activities.

Input – Output Analysis

Input – Output Analysis describes the flow of goods and services between different sectors of an economy. It is used to understand the interdependencies between industries, allowing analysts to see how changes in one sector can affect other sectors. The model is typically represented in a matrix format, where rows and columns correspond to different industries or sectors. Each entry in the matrix shows how much output from one sector is used as an input in another, providing a detailed snapshot of the economic structure at a given time.

An input-output (I – O) table is a structured representation of the economic transactions between different sectors of an economy over a specific period. The table quantifies how the output from one industry is used as input in another, capturing the flow of goods and services within an economy. It is the representation of ex-post statistical data.

Based on the data in the I-O table we can calculate the technical coefficient that are interpreted as relatively stable technical links among industries. We can use these coefficients later in the I-O matrix for calculating if the sources and uses in different industries are balanced or not.

The American economist Wassily Leontief (1906-1999) is known for developing input-output analysis. He studied economics at the University of Leningrad and later received his Ph.D. from Harvard University, where he spent much of his career. In 1973, he was awarded the Nobel Prize in Economic Sciences.

Walras´s General Equilibrium Model

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 analyses 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? Since the Walras's model, mathematicians interested in economics have developed many general equilibrium models and for some of them they succeeded in answering the above questions. For educational purposes, simpler partial equilibrium models are usually used that try to answer the questions just for one market.