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# The Importance of Using Economic Information in Economic Thought and Its Role in Achieving Economic Growth

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**Abstract:** The actual need for innovation and renewal is fundamentally the starting point for utilizing economic resources through accurate information. This information contributes to developing local economic activities and making them competitive, in addition to giving these activities greater flexibility and adaptability to surrounding changes. Furthermore, it enables them to connect with the outside world to emulate the innovation and renewal witnessed globally across various sectors.

Information can provide a suitable economic environment that keeps pace with development and modernization. It can also bridge the information gap between developed and developing countries, as it relies on accuracy and precise selection, based primarily on an analysis of current and future economic conditions.

Relying on information allows us to understand future needs by using it in statistical programs to predict actual future requirements. This presents us with all current and future options, which can alleviate many difficulties for financial decision-makers, in addition to determining the level of expenditure that the economy will require in the future. Simply put, information plays a fundamental and crucial role in providing the economy with all the necessary current, future, and historical data upon which the future development of society can be built.

**Keywords:** Information, Economic Growth, Economic Philosophy.



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## Introduction

Information is one of the most important issues that can lead researchers to the scientific truth they seek. Given the rapid and significant development in the use of information and data, researchers believe it is possible to trace the intellectual development of this research topic by examining the historical evolution of the use of economic information and its role in finding solutions to the problems facing society. The scientific importance of using information lies in the fact that it provides economic decision-makers with a significant opportunity to make the right decision at the ideal time. This contributes to the comprehensive restructuring of the economy and sets it on the right path, in order to increase productivity in various economic activities and guide the economic community precisely to create opportunities, enhance innovation and renewal, and strengthen the competitiveness of local production against foreign production [1], [2], [3], [4].

The more accurate this information is, the better equipped we can be to understand the current economic situation and identify the most significant obstacles to economic growth. Therefore, the optimal use of information can lead to positive outcomes, increasing productive opportunities by understanding market conditions and the actual demand for diverse goods and services.

Given the rapid technological advancements the world is currently witnessing, the need for optimal use of

economic information is paramount. This is essential to revitalize the local economy by creating genuine opportunities for economic diversification, rather than relying excessively on crude oil exports. Focusing on information can significantly accelerate technological innovation and provide the economy with technologically advanced products. This, in turn, creates new job opportunities and contributes to GDP growth [5], [6], [7], [8], [9].

### **Research Methodology:**

**1- Importance of the Research:** Information is a crucial and fundamental element capable of transforming the economy from decline to development. Most individuals involved in economic activities recognize the importance of information, which can greatly facilitate work, as it is a key factor in determining market competition. Information also empowers economic decision-makers to choose the appropriate economic decisions that contribute to increasing the actual productivity of society.

**2- Research Objective:** This research aims to clarify the effective economic role of information and the rapid development of information in terms of its importance to decision-makers. It also aims to analyze the economic characteristics of any society to identify its unique advantages that differentiate it from other societies. This is achieved by relying on local economic resources, namely natural resources and human resources. The latter possesses the opportunity for development through continuous training to foster innovation and renewal.

**3- Research Problem:** The research problem lies in the fact that the use of economic information is still in its infancy in developing countries, where developed countries hold the largest share in innovation, renewal, and technological development. This makes competition difficult. Therefore, researchers believe that adopting an economic approach based on economic principles can change the economic equation and move these economies to a more secure position than they are currently in.

**4- Research Hypothesis:** The research is based on the hypothesis that the use of economic information can rescue economies that rely on outdated production methods, support economic activities, and transform them into more efficient ones.

### **Result and Discussion**

#### **Section One: Information Economics in Economic Thought**

##### **Introduction: The Conceptual Framework of Economic Information**

Varian, in his published work on economics and the information revolution, asks: What does the information revolution mean for our economy?

Economists also ask: What does this astonishing growth in information markets mean? Is it sufficient to use the same lessons learned in traditional and modern economics to analyze current events and to provide insights into future developments? These are questions they raise that may prove useful in resolving the problems created by information, or in explaining the radical changes in the world of economics.

Does the information revolution play such a powerful role in change, or is it a failed endeavor, something unworthy of attention in human history?

The first requirement: A review of the concepts of information economics and information economy.

Economic thought distinguishes between two fundamental terms used in economic literature: information economics and information economy. To understand their dimensions, it is necessary to present the two concepts in detail.

Information economics is viewed as a term formulated to combine two interconnected concepts: economics and information.

The term "economics" refers to the concept that examines the foundation of the economic problem in its broad, complex, and general form. For many years, economics has recognized a fundamental economic problem: the relative scarcity of resources. It has explored development, utilization, pricing policies, markets, costs, values, and so on. Throughout the long period of discussion of the economic problem, the association of these economic concepts in the minds of those studying economic matters has been with material production and its focus, as well as on how to allocate the scarce resources involved in this

production. The questions revolve around the nature of the goods produced, how they are produced, who produces them, and how they are distributed. Despite radical changes in many concepts, both modern and classical economists agree that these concepts remain largely unchanged [10], [11], [12], [13].

Furthermore, economics, in addition to what we know about the nature of economic study, encompasses vital topics in both microeconomics and macroeconomics. Microeconomics deals with the economic behavior of individuals (both independently and within businesses), including their behavior as consumers, producers, investors, and so on. Its topics include theories of supply and demand, cost and production analysis, price and market structures, and other issues that influence and are influenced by individual behavior. Macroeconomics, on the other hand, deals with overall economic behavior at the national level, such as gross national product, national income, and national consumption.

As for the term "information," it has been treated as an abstraction representing the essence or distillation of mental activity. Therefore, there is a difference between it being a mental abstraction and it being a tangible product or economic resource subject to economic laws. What is not something the mind of someone interested in economic matters is used to is that information has economics. Therefore, the study of the interconnected and interdependent relationships between information science and economics is what is called the economics of information from an economic perspective, which examines the field in which new forms of information have been created with different economic manifestations, such as being a commodity, an economic resource, a product, or something else [14], [15], [16].

Despite the broad scope of both economics and information, attempts to define the concept of information economics precisely have not been entirely successful in achieving complete satisfaction and comprehensiveness. There remain ambiguities and a lack of clear definitions regarding the boundaries and features of this new concept. This is because a study of the intellectual output in this emerging field reveals its comprehensiveness, encompassing numerous and diverse topics explored within their specialized areas. These include, but are not limited to (Hirshleifer, 1973: 31):

- The fundamental informational assumptions for the conceptual analysis of demand functions, costs, imperfect competition, and others.
- The crucial and sensitive role of information in transaction formation.
- Keynesian imbalances in macroeconomic theory and information on opposing functions in a decentralized market economy.
- The specialized translation of scientific skills and unemployment.
- Money as an economic model and its importance in completing the transaction chain.
- The future of information generation for determining liquidity demand and transaction behavior.
- The suitability of forecasting models and other educational models. - Efficient information flow within multiple organizations.

Above all, research in the microeconomics of information, in its narrow sense, revolves around the results of applying the economic theory of uncertainty and investigating the subjective probability distribution of possible situations in the world.

Therefore, the analysis of the subject should proceed in two directions:

First - Micro-analysis: which attempts to express the value of information in quantitative terms within the context of individual economic use or at the firm level.

Second - Macro-analysis: which focuses on the contributions of information to the calculations of national output and national income... Despite the scarcity and inadequacy of attempts to provide a specific definition of the concept of information economics, Marten and Flowerdew (specialized economists) offered a definition when they defined it as:

Information economics: that branch concerned with the study of costs and cost-effectiveness. The cost return, in relation to information and the systems for displaying, disseminating, and transmitting information, is considered in relation to these systems. Information in this context refers to recorded knowledge, not, as understood by telecommunications engineers, signals passing through a communication system [17].

While this is an attempt to provide a specific definition of the concept, the focus in presenting the various aspects of the topics has been on the cost aspect, the other side of which points to production theory. This

means that it has focused on the production of information and has not addressed other aspects of the topics, such as processing and distribution.

The concept of "information economics" is that field of study defined by a contemporary and future phenomenon related to the emergence of a new and distinct economic sector known as the "information sector," in addition to the other economic sectors, namely "agriculture, industry, and services.

The "information economy" refers to an economy that relies on information as a primary driver of its goods and services across all sectors. It is also characterized by a workforce in the information sector that exceeds the combined workforce in agriculture, industry, and services, with varying proportions between developed and less developed countries.

This sector is the main generator of employment, national income, trade, and structural transformation. Knowledge-based activities play a crucial role in the information economy, similar to the role of energy and raw materials in industrial production.

While the use of the term "information sector" has sparked debate and reservations, most economists have endorsed its validity and consider it a fourth sector [18]. The prominence of this sector is perhaps one of the reasons economists have termed our current era the "Information Age." Indeed, it is an era in which the world has entered the information society, and the term "information society" has replaced "post-industrial society." The second requirement: The reasons for and dimensions of the emergence of the concept of information economics in economic thought.

The twentieth century witnessed rapid changes with profound implications, challenging humanity's ability to renew its productive forces and absorb its economic crises. Information led this change with a revolutionary force rooted in the scientific and technological revolution. Understanding the essence of this revolution is impossible without understanding its foundation. Contrary to popular belief, it is not a revolution stemming from the invention and spread of machinery. The reality paints a different picture. Its true essence emanates from science itself, through a revolution termed the scientific and technological revolution. In this revolution, science relinquished its humanistic and social role, directly linking it to the production process and production itself, making it the primary productive force (Annual Symposium of the National Center for Social Research, 1984: 76). What we now mean by revolution is the explosion of all forms of information, the use of science in multiple practical fields, as well as the increasing differentiation and integration between different sciences and the emergence of new sciences. This revolutionary nature was embodied in those revolutionary changes that were achieved in multiple fields, most notably:

The first field, which can be summarized as the "Information Technology Revolution," is the revolution related to the collection, transmission, storage, retrieval, processing, and analysis of information. It is based on linking microelectronics-based technologies with the information industry [19].

The second field is the so-called Biotechnology Revolution. This revolution utilizes the achievements of biology, genetic engineering, space research, and gene restructuring. The abundance of knowledge and information, along with advancements in genetic engineering and cell fusion, has opened up new horizons for the economical use of biotechnology [20].

The third field is the Materials Technology Revolution. This field involves the synthesis of new materials and their replacement of older natural materials based on chemical and petrochemical technologies, while also promoting the efficient use of natural resources, especially energy resources.

With the significant development resulting from the scientific revolution, which linked information and technology, and in which science became the primary productive force, new and previously unknown fields of production and reproduction opened up, leading to market expansion, increased consumption, and consequently, a transformation of the working class and human activity. Human activity shifted primarily towards intellectual work, replacing manual labor with automation. This altered the relationship between humans and machines, giving rise to new problems stemming from the relationship between capital and labor. All of this made possessing science and technology more powerful than owning factories and farms. Nations began striving to acquire science as a guarantee of global leadership or to maintain their sovereignty. The economic landscape (including services, goods, capital, and labor) expanded, acquiring the characteristic of the steadily increasing internationalization of economic life, whether spontaneously or consciously and intentionally.

These were merely the basic precursors to more serious objectives aimed at achieving self-organization, a phenomenon already present in nature, in order to enable humanity to control nature [21]. This revolution led to the formation of a comprehensive system whose fundamental characteristic is scientific progress, where science itself became a direct productive force, carrying dimensions that reshaped the face of economic life through:

1. **Restructuring the National Economy:** Economists believe that this radical change is part of a structural transformation of the economy, and its implications are evident in the following two signs.

The first sign: The increase in information activities, accompanied by an increase in the number of workers in information jobs—that is, jobs that involve the production, creation, processing, and distribution of information. This occurred as a result of the shift from the industrial sector and the change in the internal structure of systems revolving around physical production to systems revolving around information based on non-physical intellectual production. This is in addition to the transformation of the service sector from personal services to information-based services [22].

The second sign: The increased contribution of information to the Gross National Product (GNP), as the production and distribution of information goods and services adds total added value to the GNP. The two do not represent different phenomena, but rather two sides of the same coin, given that the data generated on the number of employees is required to estimate the total added value of the information sector, i.e.

### **Restructuring the Global Economy:**

The international division of labor is now taking on new forms of scientific, technological, and industrial exchange. These forms have imposed a type of international exchange that is currently characterized as an intellectual or conceptual exchange, as opposed to a purely commodity exchange. The revolution in the field of information exchange and communications is considered one of the most significant developments in this revolutionary field. Every corner of the world and every individual within it is now capable of overcoming all physical and political barriers between peoples and becoming familiar with consumption patterns and future aspirations worldwide. The information industry is characterized by unique features, including a high degree of internationalization of capital. Moreover, production within it has reached a global scale. Furthermore, the inequality between countries is evident in the new international division of labor, which has excluded a large number of countries from the information society, as information technology has become a criterion of progress. Consequently, the economies of advanced societies, particularly Western ones, have begun to rely primarily on information industries (manufacturing and distribution) more than traditional industries. Indeed, most countries in the world have begun competing with each other to transform their societies from traditional heavy industries to information-based societies, as seen in Japan.

### **3. Restructuring the Structure of the Economy Itself:**

The question that usually arises in this field, with these radical changes in the national and global economy, is: what will be the impact of the increasing importance of information on the structure of the economy itself? Some non-economist observers argue that certain elements of the public good of information will fundamentally change the nature of the economy. For example, Price predicted that information would replace money in the economy. The importance of this question stems from the fact that the form and structure of the economy will change with technological advancements over time, and because economic growth entails an expansion in the scope and capabilities of all goods and services, including new ones. Therefore, economists and other scholars will be preoccupied with these future changes, proposing new approaches and theories to accommodate them. However, Casper counters that those who believe this development reflects a new economy do not understand the old one, because the fundamental problem will remain constant even if the growth of our information stock and the improvement of communication, information exchange, and dissemination capabilities lead to the reduction or even elimination of resource constraints. Resource constraints will still be relative because human desires are not static as technology's ability to satisfy them grows.

Even if we could eliminate all resource constraints, one simple temporal constraint would remain: humans have a limited lifespan. Casper continues, stating that even if we could remove resource

constraints on humans, there would still be problems in the old economy that remain unsolvable and require further study. Allen points out in her research that introducing information as an economic commodity contradicts the assumptions agreed upon in microeconomic theory [7], [8].

Nevertheless, the question remains: what does the information revolution mean for the economy?

The second topic: The importance of modernizing the essence of economic research:

Another dimension of the scientific and information revolution is the fundamental change in the nature of science and scientific research. Science has relinquished its role as a social force, necessitating a change in the state's perspective and stance towards science and scientific research. The essence of the process currently underway is that science, possessing qualitative and quantitative characteristics, has become organically integrated into the process of material production. It now expands production in terms of its content and has itself become a direct economic process.

Scientific research has become the most revolutionary element in this process, to the extent that it has become the effective means of increasing production. The results of scientific research have become the basis for introducing new products and new production processes, given that science is a productive force and has thus become subject to the requirements and implications of the laws of economics. As conditions changed, the old relationship between science and the state changed. Thanks to the state's immense influence on society, science began to receive increasing assistance from the state, because science is no longer a private system but is now part of the basic structure of society. Given the state's role in spending and stimulating the economic cycle, research continued in the development of science and technology to encourage the modern application of scientific research findings. The state played a significant role in this regard, supporting producers and offering tax exemptions for upgrading production equipment and implementing accelerated consumption methods. This incentivized businesses and stakeholders to utilize research results in production. Furthermore, the trend of interest in scientific research in capitalist countries took a more significant and far-reaching turn when a new type of shared ownership emerged among capitalists in the field of scientific and technological research. This gave rise to a new industry within the capitalist economy called the "knowledge industry," where science became a commodity and an object of production and exchange. It received the largest share of investments and expenditures. Despite the superiority of some companies, such as the G7, in this area, they still dedicate a percentage of their spending to research and development, accompanied by efforts to stimulate and activate demand for research and development outputs through industry.

### **1- Capitalism and the Scientific and Technological Revolution:**

The scientific and technological revolution has a capitalist intellectual dimension; indeed, it can be described as the capitalism of science and technology. Capitalism has been able to renew its power exponentially, re-emerging under the name of contemporary capitalism, a system of production based on the private ownership of capital. This is not unusual for capitalism, as it has changed and diversified several times throughout its development. In each stage, it passes through a phase of its life cycle, progressing from commercial capitalism to industrial capitalism to financial capitalism, and finally to post-industrial capitalism. Contemporary capitalism, therefore, has surpassed all of this, reaching a higher stage of developing the forces of production based on science and technology. Capitalism has effectively utilized and developed the achievements of modern science. It has integrated science and production, transforming science into a productive force, so that capitalism remains capitalism despite its changing manifestations. Its fundamental law remains uneven development, both internally and externally.

### **2- Globalization and the Scientific and Technological Revolution**

The scientific and technological revolution embodies the intentions of globalization as it is understood, as it entails dismantling the existing divisions between national and external economic spaces and removing all economic restrictions between them.

Countries, by virtue of the information technology revolution, have made globalization possible, facilitated by scientific and technological advancements.

- Perfect quality control.
- Standardization of industrial processes.
- Establishment of cost-effective and reliable transportation facilities.

- World-class management systems with communication services.
- Globalization of manufacturing and trade through Just-In-Time (JIT) management and production, eliminating defects.

In this context, it is essential to distinguish between the globalization of technological development in information and the content of the information that must be circulated and globalized. The fundamental and immediate issue is not the globalization of technology, but rather the globalization of information itself and its monopolization by technology owners. It is crucial to emphasize the increasing danger of information monopoly.

3- Information Economics in Economic Intellectual Output  
The 1960s witnessed a trend towards serious studies on information economics, both microeconomic and macroeconomic. An analysis of the intellectual output of Information Science and Technology (ARIST) indicates the existence of diverse studies on the subject, varying according to the interests and contributions of economists and researchers in dealing with this phenomenon. The researcher has classified the aspects addressed by economists and researchers in studying the subject, based on the economic nature of information, into:

The first axis: This focuses on measuring the information sector at the national level and analyzing the economics of the patent system from the perspective of scientific research and science. It implicitly focuses on the economics of information in education and discusses how major economic activities are structured, measured by cost-benefit metrics.

The second axis: This focuses on studying the value of information and its crucial role in formulating economic theories and analyses, as well as the contribution of information to the development of economic theory, given the extraordinary economic characteristics of information.

The third axis: This focuses on studying the economics of information technology, information systems, and spending and investment in the information industry. First Axis: Measuring the Information Sector at the National Level and Analyzing the Economics of Patents

In the era of the scientific and technological revolution, economists recognized the importance of science and scientific research, leading to the establishment of a new industry within the economy: the "knowledge industry," also known as the "invention industry," where science became a commodity and a subject of production and exchange.

Perhaps the first to observe this phenomenon in terms of its impact on the future of the economy was Fritz Machlup in his early published work, his famous book on the world of economics, information, and knowledge distribution in the United States in 1962. In it, he coined the term "knowledge industry" and developed a specific concept for the information sector. He presented a model for solving the intellectual problems in defining and measuring the information sector, due to the inadequacy of models designed for the agricultural, industrial, and service sectors to measure the size of the new sector. His model gained prominence when he was commissioned by the US Congress to study and analyze the economics of the patent system. His study relied on cost-benefit analysis, and through examining the operation of the patent system, he found that this system is only part of a larger issue.

Investing in research and education led to the recognition of the need to modify the general framework of national accounts to analyze this large-scale process. He began with the premise that economists had developed the National Income and Product Accounts (NIPA) to provide a systematic method for measuring economic activity. NIPA is capable of providing a framework for organizing data and generating statistics about activities within the national economy. Such statistics describe what is happening and the relationships between different sectors. Machlup emphasized the role of the accounting system in clarifying the conceptual boundaries that allow for identifying which activities should be included and which should be excluded.

The main problem that concerns economists is defining the appropriate conceptual boundaries for the NIPA framework for measuring information activities. Machlup presented a framework, illustrated in **Appendix 1**, that includes the components of this sector:

1. Education.
2. Research and Development.
3. Communications.

#### 4. Information Technology.

#### 5. Information Services.

Based on this model, the share of the information sector in the United States' gross national product in 1958 was estimated at between 23% and 29%, increasing to 40% by 1968 (Lamberton, 1971: 37).

Machlup's studies have been a major contribution to our understanding of the information sector within the framework of the global economic system. Boulding, K. E., points to their importance when he describes them as having profound implications for traditional economic theory, because the concept of the "knowledge industry" contains enough dynamite to derail traditional economies (Boulding, 1963: 39).

Machlup's studies have profound implications for traditional economic theory. And when discussing Machlup's studies, we mustn't forget Porat's 1977 study, which is considered one of the two most important foundational studies in this field. Machlup's study ranked first, and Porat's second, as he developed the concept of the information economy and created a methodology for measuring the size of this sector, as illustrated in Appendix 2. This methodology utilized concepts based on national income accounts and their relationship to other sectors. Furthermore, he studied the implications for an economy transitioning from manufacturing to information technology.

Porat began his discussion of information activities, which he grouped into primary and secondary information sectors, based on the existence of market transactions related to information activities. He provided an answer to the question of whether the pre-NIPA framework could be used to define a suitable measure of the information economy, or whether the NIPA framework should be redefined to reflect the structure of the new economy. Although both scholars addressed the same general topics, the fundamental difference lay in their approaches. Machlup aimed to establish a framework for measurement and define the information economy, while Porat sought to measure its size using concepts based on national income accounting. This led to disagreements between them. According to Machlup's commentary on Porat's study, the dispute centered on the content of the secondary sector and the validity of value added or final demand as an accurate measure of the size of the information economy (Machlup, 1980: 240). In their efforts to define the information sector precisely, they questioned whether a definition existed within the accounting conventions of the National Institute of Statistics (NIPA).

It is necessary to define the basic sectors comprising the information sector (information services and information goods) because the overall objectives of the information sector become clearer when its primary and secondary components are defined. Many elements of the sector can be independent industries or affiliated with other industries. Primary components include goods and services that have monetary value in the market. Therefore, it is essential to define information activities that may be considered part of the secondary sector and that may remain hidden [12]. For example, if a company purchases accounting services from the market, such information activity is classified as primary. However, if the company arranges these accounting services internally by employing one of its staff, such activity is classified as secondary information [14].

The primary components include information services and information goods. The second axis: The value of information and its role in formulating economic theories and analyses. Measuring and analyzing the information sector was only one aspect of the concerns of information economics, as the subject has other, more important facets that require further investigation. Therefore, economists began studying it because they recognized the importance of information and its unusual characteristics, which must be examined when developing their models. The seriousness and importance of the subject became evident when it became one of the major challenges facing economic theories, namely, neglecting the subject without in-depth study [17].

From this perspective, the concept of information economics was readily accepted by the economic community. This topic gained extraordinary importance, surpassing previous research, when the economic nature of information and its distinctive economic characteristics began to be explored. These characteristics played a significant role in economic thought, prompting economists to investigate them in two main directions:

The first direction examines the value of information and analyzes its role in developing economic thought and theories.

The second direction studies the nature of information, its unique economic characteristics, and how its value is assessed. As for the first approach, it is concerned with analyzing the role that information plays and its value in the development of economic thought and its theories. Most classical economic theories rely on a basic premise that information is available, complete, and suitable for those who deal with it. The classical economists' disregard for information as a variable in building their economic analyses and their acceptance of the fact that information is free and complete has led them to miss the important role that information plays in developing their analyses. Perhaps the existence of the phenomenon of risk and uncertainty, and the developments and changes that classical economic theories faced, played a role in the emergence of the concept of information economics, as a reaction or response to the need to develop economic theory based on some unrealistic assumptions related to providing certain and sufficient information to its users (Ibid: 33). Therefore, the first appearance of the concept of information economics was to be a countermeasure to the state of uncertainty, as the subject of information economics has an effective role where the subject of uncertainty economics has no effectiveness in its existence. It examines the role of information that reduces the states of uncertainty for its recipient, based on the idea that economists know information as a phenomenon to reduce uncertainty. It also examines the difficulties of the expected value of information, which is the basis for meeting the uncertainties of its recipient. Therefore, classical economists "positivists" placed a role for information in their economic models, and modern "normative" economic thought also emphasized the importance and role of information in organizational, technological and informational change and in economic analysis.

This demonstrates the growing interest in the subject within economic analysis, given the role of information in reasoning. This is embodied in the early trends that emerged within the framework of the concept of information economics. The complete disregard for the role and value of information in constructing the hypotheses of economic theories and in their application has led to difficulties and problems in economic thought, necessitating an investigation into the role of information in:

- Market theory
- Evolutionary theory
- Decision-making theory. Within the scope of market theory, the clear assumption is that:
- Information is complete, certain, and available to everyone.
- Information is a free and cost-free commodity.

Information economics has proven the failure of the assumption that information is cost-free for the user in economic analysis, because it has built upon flawed perceptions and incorrect analytical models. Individuals and organizations incur costs to obtain information. In the field of economic development theory, the assumptions underlying the theoretical framework for economic growth have proven inaccurate because they yield questionable values. This is because economic development theory is part of the broader problem of evolutionary change in science. This problem has led to the adoption of mathematical models for proof and demonstration, aiming to determine which economic systems should be retained and which should be eliminated. This reflects the value of information content in determining options for future development in the construction of systems and their structures, which is part of the concept of system change.

In the area of decision-making, economists have overlooked the fact that their assumption of free and complete information has been invalidated by the proven reality that organizations and individuals incur costs in acquiring information, and that information, with its inherent certainty, plays a role in decision-making. The decision-making approach represents another direction in information economics. It examines situations of uncertainty or the lack of complete and certain information for decision-making purposes. The study presented by economist Frank Knight in 1921 on risk, uncertainty, and profit (Risk, Uncertainty & Profit) is considered the first analytical study to consider the problem of decision-making in the absence of complete information. Rationality is seen as a guide to behavior, where rationality refers to the appropriate selection of decision situations that lack empirical evidence for probabilistic estimates of possible returns. From this stems the adoption of the decision-making approach to measuring the value of information.

The second approach examines the nature of information and its unusual economic characteristics, along

with how to estimate its value. Information economics has given extraordinary importance to measuring and evaluating the value of information by understanding its nature and its unusual economic characteristics. Hirshleifer describes a number of these characteristics that indicate the value of information to its potential users and producers in the following list.

1. Certainty
2. Diffusion
3. Applicability: particular vs. general
4. Content: Environmental vs. behavioural tastes, endowments, technology vs. Market parameters
5. Decision-relevance

Horton and Cleveland present the concept of information as a resource in comparison to other resources, stating that :

1. Information as a human resource: It exists within human perception.
2. Information is expansive: The free flow of information maximizes its use, even though many instances of this contradict the economic methods of valuing and appraising things, because mass production renders things useless.
3. Information is compressible.
4. Information is substituteable, as in the case of money replacing other resources.
5. Information is easily transportable using technological applications.
6. Information is diffuse; it is capable of being leaked, and thus, its possession is like a mental substance in the human mind.
7. Information is shareable.

Boulding was the first to investigate the nature of information. He attempted to use explanations offered in other cognitive fields to describe the mental content of the human mind represented by information, and to search for its counterpart outside the realm of the mind, which represents this cognitive content residing in the human mind. His research led him to find that information possesses abstract properties that tend toward the meaning of the word "truth." It constitutes meaningful mental facts. From this, he deduced that to assess the value of information, one must consider the intrinsic properties of information that make it a commodity subject to the rules of economic exchange. He faced difficulty in convincing the economic community, as his conclusion sparked controversy and difficulties in accepting the idea from some and opposition from others.

We are now faced with a new commodity: information. This commodity has a vast market, as it can be sold to multiple buyers simultaneously without diminishing the owner's capital. Furthermore, it is not subject to conventional marketing methods.

Information is a commodity that cannot be completely withheld from the market. What distinguishes its market is that market mechanisms are unsuitable for information due to the difficulty of achieving fair competition in dealing with this commodity.

If information is a commodity, it can also be a product in itself. Therefore, it requires a source for its production, in addition to incurring costs that determine its economic value.

As soon as the idea of information as a commodity emerged, design, research and development centers and production processes proliferated, requiring the investment of skills. Discussions then turned to the scale of investments in the information technology industry and information manufacturing, and spending on long-term, high-risk research and development became central to the new model of economic growth.

With the emergence of the new field of knowledge called information economics, the concepts of "information owners" (those who produce information and profit from selling their private information) and "information seekers" (those who profit from producing information obtained through purchase or other means) arose.

Given the disparity between the costs of information production, represented by research and development expenditures, and the potential return, coupled with the lower cost of producing counterfeit information, intellectual property rights laws for electronics and information emerged.

Third Section: A Study of the Economics of Information Technology and Information Systems as an Economic Resource

With the spread of the concepts of knowledge and computer industries in the information age, research and development centers proliferated. The new investment landscape shifted to information technology and human capital, leading to discussions about the scale of investment and spending in high-risk research and development projects, and the new economic growth model and its interpretation with the emergence of the field of knowledge known as information economics.

Economists recognized the importance of information as a resource, whether for human capital investment or investment in the information industry and data storage, when economist Jacob Marschack highlighted it in his series of research papers published between 1954 and 1977, which explored:

- Towards an Economic Theory of Information Systems (1954)
- Observations on the Economics of Information (1959)
- The Economics of Inquiry, Communication, and Decision-Making (1968). In these works, he investigated the foundations upon which investment projects and economic integration with technological phenomena are built, as well as attempting to establish rules and principles for dealing with them.

To help organizations maintain their competitive advantage, he presented the following model (Figure 1-3), which illustrates how large quantities of data are collected, transmitted, and processed, thus transforming information into an economic resource in itself. The technological revolution has brought about a decisive development, establishing an information technology economy reliant on electronic intelligence. The advancement of microelectronics has led to greater efficiency in transforming the relationship between small-scale production and large-scale operations. Current trends are exploring:

- Market conditions in the context of information production and distribution.
- How to quantify the costs and benefits of information projects.
- How to price information services and estimate their production costs.
- Researching the problems of measuring information scientifically and technically.
- The criteria for evaluating and designing effective systems.
- The nature of national policies for support and intervention.

### **Conclusions:**

- 1- Information is one of the most important pillars for building economic research and proving the hypotheses from which the researcher proceeds. The success of the results depends on the credibility of the information obtained from actual sources relevant to the research topic.
- 2- Most economic studies and research indicate the importance of obtaining information from reliable sources and avoiding reliance on inaccurate information that could affect the accuracy of the results and lead economic policymakers to unrealistic, almost misleading, conclusions.
- 3- When examining economic theories, we observe the extreme precision required to obtain economic information and its effectiveness in addressing problems that could lead to structural imbalances in the economy. Upon closer examination, we see that classical and Keynesian theories remain effective to this day because they were based on ideas and approaches that relied on accurate information.
- 4- Most economies, whether developed or developing, suffer from inherent problems that are almost a defining characteristic of these economies. These problems are often primarily linked to the lack of accurate information about the size of resources and the nature of the economy's advantages. This leads to the emergence of the problem and the accumulation of measures that exacerbate it, transforming it into a widespread phenomenon.

### **Recommendations:**

- 1- The researcher recommends relying on economic information through a realistic examination of economic theories that can address the problems plaguing the economy. Relying on accurate economic information will guide economic policymakers toward successfully addressing the problem.
- 2- Economic information should be obtained from direct sources, avoiding reliance on secondary sources whose data may be unrealistic and often biased, thus leading to inaccurate results.
- 3- It is important not to rely solely on current information. Attention should be paid to historical data and data issued by the government and its institutions to arrive at accurate results that reflect the economic

reality of the region under study.

4- The growing interest in information technology is an open invitation to researchers in various fields, especially economic researchers, to benefit from these modern experiences that would reduce the time and effort spent in obtaining information.

## REFERENCES

- [1] R. O. Yousef and M. J. Al-Sumaidi, *Marketing Technology*, 1st ed. Amman: Dar Al-Manahij for Publishing and Distribution, 2004.
- [2] S. G. Yassin and B. A. Al-Alaq, *E-Commerce*, 1st ed. Dar Al-Manahij, 2004.
- [3] S. G. Yassin, *Fundamentals of Management Information Systems and Information Technology*, 1st ed. Amman: Dar Al-Manahij, 2006.
- [4] S. G. Yassin, *Analysis and Design of Management Information Systems*, 1st ed. Dar Al-Manahij, 2000.
- [5] A. R. M. Qasim, *Analysis and Design of Accounting Information Systems*, 1st ed. Amman, Jordan: Dar Al-Thaqafa Library for Publishing and Distribution, 2004.
- [6] M. T. Naseer, *E-Marketing*. Amman: Dar Al-Hamid for Publishing and Distribution, 2004.
- [7] A. M. Naasani and M. W. Aqili, *Human Resource Management (A Strategic Approach)*. Amman: Directorate of University Books and Publications, 2005.
- [8] A. J. M. et al., *Measuring the Institutional Performance of Government Agencies*. Arab Organization for Administrative Development, Seminars and Conferences, 2000.
- [9] R. McLeod, *Management Information Systems*. Kingdom of Saudi Arabia: Dar Al-Marikh Publishing, 1998.
- [10] D. M. Stowell, *Sales, Marketing, and Continuous Improvement: Six Best Practices for Revenue Growth and Customer Loyalty*, 1st ed. Saudi Arabia: Al-Akeeban Library, 2002.
- [11] J. Kao, *Creativity in Projects and the Role of Free Improvisation*, 1st ed. Cairo: Al-Ahram Center for Translation and Publishing, 2001.
- [12] J. Fuller, *Project Management for Performance Improvement*. Cairo: Dar Al-Fajr for Publishing and Distribution, 2001.
- [13] N. J. Caper and L. F. Dessler, *Public Administration: Adaptive Social and Administrative Change*. Amman, Jordan: Dar Al-Basheer, 1988.
- [14] M. Q. Al-Qaryouti, *Principles of Management: Theories, Processes, and Functions*, 1st ed. Amman: Dar Safaa for Publishing and Distribution, 2001.
- [15] A. S. of Certified Accountants, *Information Technology*. Amman, Jordan: Al-Shams Printing Press, 2001.
- [16] M. Q. Al-Qaryouti, *Organizational Behavior and the Study of Individual and Group Human Behavior in Different Organizations*, 3rd ed. Amman: Dar Al-Shorouk for Publishing and Distribution, 2000.
- [17] F. J. Al-Najjar, *Management Information Systems*. Amman: Dar Al-Hamid for Publishing and Distribution, 2005.
- [18] A. T. A.-M. et al., *Information Technology and its Applications*. Ministry of Higher Education and Scientific Research, Technical Education Authority, 2001.
- [19] S. M. Al-Masri, *Organization and Management: An Introduction to the Elements of Planning, Organizing, Leading, and Controlling Processes*, 1st ed. Alexandria: University Press, 1999.
- [20] M. Al-Lawzi, *Administrative Development*, 2nd ed. Amman, Jordan: Dar Wael for Publishing and Distribution, 2002.
- [21] A. K. Al-Kubaisi, *Human Resource Management in the Civil Service*. Publications of the Arab Organization for Administrative Development, 2005.
- [22] O. Al-Kilani and et al., *Introduction to Management Information Systems*, 2nd ed. Amman, Jordan: Dar Al-Manahij for Publishing and Distribution, 2003.