

Influence of Internet Innovation to Macro-economy and Financial Fluctuations

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Abstract: Since the financial crisis in 2008, macro-economy and financial fluctuation have become widely concerned issue for scholars from all circles. Internet innovation, as a new business model, has achieved rapid progress in China and makes significant impact on macro-economy and financial industry. This paper analyzes the influence of internet innovation to macro-economy and financial fluctuations, investigates the macro-economic and financial development under influence of internet innovation, and thus provides reference for rapid development of China market economy.

Keywords: Internet innovation; Macro-economy; Financial fluctuation; Influence

1. Introduction

In recent years, China financial industry is seeking a new development pattern. Under the background of internet innovation, conventional financial industry has been severely affected, not in content but in trading range and object. Moreover, as financial management and trading mode are networked, financial cost control under internet innovation shows significant advantage. As internet financial products are constantly enriched and internet finance system is gradually improved, macro-economy and financial fluctuations are changed in certain degree, with financial products being more and more simple and software-oriented. On this basis, this paper explores the influence of internet innovation to macro-economy and financial fluctuations, with the purpose of providing aid to relevant sectors.

2. Influence of Internet Innovation to Macro-economy and Financial Fluctuations

2.1. Internet innovation mechanism change

In recent years, as internet plays an increasingly important role and enjoys advantage of high degree of sharing, wide applicable range and fast propagation speed, the internet innovation mechanism has changed a lot, which poses great influence to macro-economy and financial fluctuation. The change of internet innovation mechanism is mainly manifested in following aspects: (1)clustering of innovation. As an important platform of transinformation in contemporary society, internet is constantly gathering personnel and enterprises in conventional industries. Under the management of flat network, many conventional economic industries start to optimize their information resource via internet, which reflects the key role of internet innovation.(2)Fast innovation. As internet platform is widely applied, the innovation cost of

conventional enterprises have been significantly reduced. By integrating innovation thoughts and ideas in resource pool, the fast innovation of internet can be given full play.(3)popularization of innovation. On the basis of efficient communication of internet, the innovation results can be delivered to end users very quickly, which increases innovation value while reducing enterprise cost, promotes the sustainable development of macro-economy and financial industries[1].

2.2. Internet innovation reduces macro-economic fluctuation risk

Through relevant researches, the essence of internet innovation is to guarantee economic individual make correct decision on the basis of circular appreciation of resource information, so as to reduce the impact to macro-economy. Risk undermining effect of internet innovation is mainly manifested in following aspect:(1)internet innovation can leads to balance between supply and demand, and thus reduces the economic fluctuation caused by demand.(2)internet innovation optimizes and improves financial market mechanism, and effectively avoids financial fluctuation caused by information asymmetry.(3)internet innovation makes macro-economic decision more reasonable, and gives fully play to the adjustment effect of macro-economic policy.(4) internet innovation breaks space-time limit and controls global financial fluctuation.

3. The Opportunity and Challenge to Macro-economic Development under the Background of Internet Innovation

3.1. Opportunity brought by internet innovation

3.1.1. Internet-based peer-to-peer lending (P2P)

For traditional lending, cost is a big limitation prohibiting direct dealing between both parties, which gives opportunity to the lending services of financial industry. In conventional situation, financial enterprises normally provide corresponding funds to customers according to their risk assessment levels and benefit from such transaction. Under the background of internet innovation, the transaction of lending can be realized via internet, allowing capital demander to obtain money more quickly. Although, a large number of documents are needed during the operation process and most lending modes are identical, substantial cost can be saved for financial enterprises. In addition, traditional financial enterprises generally ignore small and micro businesses in lending, while the internet-based lending can cover all enterprises, which broadens financing channels, relieves pressure of enterprise operation and promotes sound development of macro-economy.

3.1.2. Internet-based money management

Due to the limitation of cost, the threshold amount of application money for money market fund is relatively high, which is not friendly to middle and low-income family. In the context of internet innovation, financial mode is dominated by internet financing, which can integrate function of capital pooling, money management and investment and fast payment at lower cost, shocking the conventional financial industry in certain degree. The internet-based financing products can provide good services for small share savers and allow them to select financing products according to their enterprise needs. On the basis of internet platform and customer resources, finance enterprises can effectively control cost, improve economic benefit, meets the investment desires under the premise of saving investors' time and cost, and manage invested funds during spare time [2].

3.1.3. Enhancement of capital allocation efficiency

Internet innovation accelerates the development pace of financial market, therefore, financial sectors must enhance their capital allocation efficiency, so as to catch up with the economic growth pace. China financial system has long been in depression state, the interest and capital are managed by specific systems, leading to severe problem of financing deposition. In the context of internet innovation, the velocity of money circulation of financial sectors can be increased, and small idle funds can be gathered effectively. In addition, internet innovation means the online trading of financial resources is possible, therefore the role of intermediary agent can be removed, and the capital amount, individual preference and investment time can be communicated via internet, which substantially increases the utilization efficiency of financial funds. Internet innovations accelerate the distributing rate of bank deposit, and thus pose certain shock to con-

ventional banks. According to incomplete statistics, Yu 'ebao capital scale has reached to 1.43 trillion as of the end of June, 2017.

3.2. Challenges brought by internet innovation

3.2.1. Imprecise judgment of pre-alarm function of internet innovation

The pre-alarming function of internet innovation is mainly manifested in following aspects: (1) internet innovation has forewarning function to macro-economic fluctuation, and innovate transmission mode and improves transmission speed based on business model of the internet. However, unstabilizing factors still exist during the development of macro-economy. The internet fluctuation index will show magnifying trend at certain time point, which exerts pre-warning function upon external economy.(2)Internet innovation relieves the macro-economic fluctuation. Through relevant trend analysis, it can be known that internet fluctuation will be reduced when the economic crisis emerge. (3) Internet innovation can control the phenomenon of information asymmetry and quickly restore supply-demand balance. However, it is an extremely challenging work to judge macro-economic fluctuation situation and risk under quantitative data analysis [3].

3.2.2. Increase the operational risk of macro-economy

Internet innovation not only brings opportunities for macro-economy and financial fluctuation, but also causes operational risk due to network security factors. For instance, due to the virtuality of internet, some trading activities are performed without real-time monitoring, leading to operational risks for many financial enterprises.

4. Countermeasures to Macro-economic and Financial Fluctuations in the Context of Internet Innovation

4.1. Learning from the experiences of western developed countries

In the development of macro-economy and financial institutions, we can learn from the experience in internet innovation of western developed countries and explicit the position of internet innovation in the process of industrialization. To prevent the risks in macro-economic fluctuations, first we should establish an internal risk monitoring system, improve risk evaluation system and formulate short-term and long-term development strategy. Regarding short-term development, we should focus on the development of advanced industries such as internet, promote macro-economic growth, prevent risks in macro-economic fluctuation with the aid of fiscal and monetary policy under governmental decision. Secondly, re-

garding long-term development, we should formulate systematic development strategies, take internet technology as industrial core, and promote harmonic economic and social development. Promoting macro-economic development with internet innovation not only guarantees the stability of economic structure, but also allows to achieve national economic goals on schedule, so as to realize sustainable development of macro-economy and financial institutions [4].

4.2. Innovation of economic management mode

Internet innovation creates opportunities for the development of financial industry. Serving as the basis for informatization, internet has become a innovation platform for promoting urbanization, agriculturalization and industrialization. Under such circumstance, backward management system is to be reformed urgently. Only upstream and downstream industrial chains are connected through, and the economic management mode is innovated, can the fundamental effect of internet innovation be given full play. First, on the basis of scientific and technological innovation, the governmental sectors should strengthen macro-management of scientific and technological innovation plan, give fully play to internet innovation platform, realize effective monitoring and management of market using innovation mechanism, and make reasonable allocation of markets. Secondly, internet platform can realize integration and innovation of traditional industries. For example, car-hailing apps, the internet provides open management pattern.

4.3. Giving full play to the function of internet finance

4.3.1. Comprehensive monitoring of internet innovation

Comprehensive monitoring of internet innovations can be implemented from following aspects:(1)establishing a sound legal system, formulating corresponding supervisory law according to actual situation of internet innovation, perfecting intellectual property protection measures, guaranteeing legal interest of internet innovations. (2)giving fully play to the guiding and leading role of internet innovation, guaranteeing internet innovation develop in a correct direction, enhancing supervision of the effect of internet innovation on macro-economy and financial fluctuations.(3)establishing risk-reducing system for macro-economic fluctuation under internet innovation, effectively monitoring and eliminating risk factors.

4.3.2. Organic integration of traditional economies and internet innovation

Regarding the integration of traditional economies and internet innovation, following issues should be considered:(1)The consciousness of innovation should be in-

duced into traditional economies. Under the mode of internet innovation, we should accumulate experience, optimize the operation procedure of the two and enhance the accuracy of integration.(2)The data on traditional economy should be subjected to networked analysis. On the basis of using internet tools, we should focus on the internal value of value and provide relevant basis for macro-economic development[5].

4.3.3. Construction of environment for internet innovation

To enhance sound development of macro-economy under background of internet innovation, a suitable environment for internet innovation must be constructed, which can be implemented from following aspects:(1)The government should introduces awarding policies and files for risk premium. The government can grant reward to those enterprises which achieve accomplishments via internet innovations, offer risk premium for those encountered with problems during innovation, so as to give full play to the key role of internet innovation in macro-economy.(2)Constructing network-based credit evaluation system, realizing standard development of internet innovation, and rationally dealing with macro-economic and financial fluctuations.(3)Constructing sound customer security system via internet innovation, strengthening propaganda work on risk prevention, reducing the influence of internet innovation to macro-economy.

5. Conclusion

In conclusion, internet innovation not only bring opportunities but also challenges to enterprise reform and innovation. Therefore, we must master the development law among internet innovation, macro-economy and financial fluctuation, effectively avoid economic risks, realize reasonable adjustment of industrial structure, secure economic stability and promote sound development of China macro-economy.

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A Review of Four New Nanomaterials

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Abstract: This paper briefly describes the research status of embedded fullerene, graphene, self repair materials and carbon nanotubes, and its properties, application field and defect analysis are briefly summarized. Finally, this paper summarizes how new materials should be popularized, and points out the future research directions of new materials.

Keywords: Graphene; Embedded fullerenes; Self repairing materials; Carbon nanotubes; Properties

1. Introduction

Material is a very broad term. Small to the naked eye of nanotechnology, as large as the world's largest building, as long as it is able to constitute our life, it is called material. It can be said that materials constitute the condition of our lives.

2. History of Material Development

In the early days of ancient times, archaeologists called this period the Paleolithic period, while human processing techniques were polished. By the end of the ancient period - the Neolithic age, man learned to make use of fire to burn clay, so Tao became the first material for processing technology. With the technology of fire, man has found the two materials, copper and iron. In the early twentieth Century, the development of science such as chemistry and physics gave mankind a new perspective to look at materials. People began to use synthetic materials and synthetic polymers. But human beings are not limited to this. Human beings are beginning to want a material to have two completely opposite attributes. The emergence of cermets marks the birth of composite materials. The variety of materials became richer after twenty-first Century. A variety of 3D printing technology and nano materials have been integrated into people's lives, there are more new materials are also in the promotion and application.

3. Graphene

3.1. Graphene profiles

British physicist Novoselov used his graphene to win the Nobel prize for physics in 2010. Graphene belongs to nano material, because of its extremely rare conductivity, extremely low resistivity, very fast electron migration speed, and beyond the strength of dozens of times steel and excellent light transmission and swept the world.

3.2. Properties of graphene

Graphene is a honeycomb lattice structure formed by the close packing of SP² carbon atoms, so it has the following properties:

1) Electrical properties. The conductivity of graphene is 106S/m, which is the best material to be found at room temperature at present.

2) Optical properties. The zero bandgap structure of graphene makes it theoretically free to absorb light at all wavelengths and is referred to as an optically transparent conductor. The transmittance of single graphene sample is 97.7%, and graphene has saturable absorption to light.

3) Mechanical properties. The modulus of elasticity of graphene is 1.1TPa, while its tensile strength is 125GPa, which is the largest tensile strength in the current material.

4) Thermal properties. At room temperature, graphene has a thermal conductivity of 5000W/m.K, the highest thermal conductivity found in humans.

5) Other properties. Graphene has a large surface area, which makes it possible for battery storage. Graphene also has sensing capabilities, as well as hydrogen absorption, double click semiconductors, superconducting ferromagnetism, and other characteristics.

3.3. Applications of graphene

Graphene's superior electrical and optical properties make it widely used in both electronic and semiconductor applications, as well as in aerospace and military applications. Graphene has also been used in the field of biomedicine: in 2015, Dr. Jiao Guozheng of Harbin studied the effects of graphene on biological metabolism of liver cancer or liver cells.

Graphene and other materials composed of composite materials is also one of the directions of scientists. Graphene has a very wide range of properties, and its range of applications is very wide, so this determines its importance.

3.4. Prospects and defects of graphene

Graphene has many properties, which make it applicable in various fields, and it can also create new materials. Graphene will be visible in all areas in the future.

Graphene, however, cannot be produced in large quantities, which is a major impediment to its popularity. How to manufacture a large amount of graphene with cost-effective way is the focus and difficulty of scientists. Now scientists have developed effective methods for producing graphene, this method is done by Dr. Wang Xiaona and the teacher of the Harbin Institute of Technology in 2015, so the graphene mass production and promotion can be realized in the near future.

4. Endohedral Fullerenes

4.1. An overview of fullerenes embedded

Fullerenes embedded in fullerenes are developed from fullerenes. Fullerene is the third allotrope of elemental carbon, which has a unique effect in anti HIV, inhibition of enzyme activity, DNA cleavage and photodynamic therapy. In 2001, University of Oxford discovered that there are some specific species in fullerenes, which are embedded fullerenes.

4.2. Characteristics of embedded fullerenes

Because fullerenes contain special materials, they also have quantum properties. The special substances in fullerenes can be metals, inert gases and rare earth elements. Among them, the embedded fullerene has become the main research object of fullerene because of its rich variety and diverse structure, and the embedded metal fullerene has many excellent physical and chemical properties.

4.3. Applications of embedded fullerenes

Fullerenes and graphene are new materials derived from carbon atoms, so fullerene has great efficacy in optics, electricity, mechanics, medicine and catalysis.

The combination of special materials and carbon cages makes the embedded fullerene molecules break through the original physical and chemical behavior, which greatly broadens their application fields.

Fullerene is also a carbon nano material, which has antioxidant activity and cell protection in biomedicine. Metallofullerenes may develop into high temperature superconducting materials, optical materials, molecular devices, functional MRI contrast agent and biological tracer and other new materials, and may become a new diagnostic and therapeutic radiopharmaceuticals.

4.4. Prospects and defects of embedded fullerenes

Embedded fullerenes are prominent in the field of medicine, but, like graphene, its high cost is the biggest obstacle to its popularity. Because of the difficulty of separating embedded fullerenes from other mixtures of fullerenes, the difficulty of refining technology leads to higher

cost of the material. But studies have found that the chemical effects of fullerenes can greatly alter their toxicity. If you can overcome these two difficulties, then embedded fullerenes may appear in the public life, especially in the field of medical and beauty.

5. Self-repairing Material

5.1. Overview of self-repairing materials

As the name suggests, self-repairing material is a self-healing process where the material is damaged. It includes reversible polymers, shape memory materials, inorganic capsules, confining systems, and popular biomaterials.

5.2. Characteristics of self-repairing materials

Be able to repair some minor external damage independently and repair the damage of some materials by heating. Convenience and durability are the reasons for its concern.

5.3. Applications of self-repairing materials

5.3.1. Architectural aspects

Recently, the more successful self-repairing materials are self-repairing concrete and self-repairing coatings. Compared with traditional building materials, they have the advantages of long service life, low maintenance cost, high safety and high environmental protection.

5.3.2. Space and ship aspects

Self-repairing coatings are also significant in cutting-edge technology. They have excellent strength, heat resistance, adhesion, scratch resistance and stain resistance.

5.3.3. Electronic aspects

The function of self-repairing coatings in electronic protection is also outstanding, and its scratch resistance is one of the main reasons for attracting the attention of consumers. Electronic products are easy to scratch, which is a pain in the minds of every consumer, so the film and tempered film will be purchased by consumers. Consumers no longer have to worry about electronic products being scratched, which will greatly boost the development of self-repairing coatings.

5.3.4. Mechanical aspects

With this kind of material, the running state of all kinds of mechanical equipment will be close to the ideal state, and the service life will be increased, while the maintenance cost will be reduced.

5.4. The prospects and defects of self-repairing materials

Self-healing materials can be used in various industries, covering a wide area, and its practicability is also very

strong. If we want to promote self-repairing materials, we must reduce the manufacturing cost. Only in this way can we promote it in large quantities and enter the market with superior performance.

6. Carbon Nanotubes

6.1. General situation of carbon nanotubes

Carbon nanotubes aka buckytubes, which is a kind of special structure of one-dimensional quantum materials. It can be divided into single wall carbon nanotubes and multi walled carbon nanotubes according to the number of graphene sheets. The perfect hexagonal structure of carbon nanotubes makes it mechanical, electrical, and chemical.

6.2. Characteristics of carbon nanotubes

6.2.1. Mechanical properties

Carbon nanotubes tensile strength of very high, up to 50~200GPa, which is 100 times the steel, while the elastic modulus of 1TPa, in full about 5 times that of steel. Although the hardness of carbon nanotubes is similar to that of diamond, it has good tensile properties, which is an ideal high strength fiber material.

6.2.2. Electrical property

Carbon nanotubes have good conductivity, and their conductivity is 10 thousand times that of copper.

6.2.3. Heat transfer performance

As long as a small amount of carbon nanotubes are doped in the material, the thermal conductivity of the composite will be greatly improved.

6.2.4. Optical property

The optical properties of carbon nanotubes are nonlinear, their luminous intensity is high, and their resistance and boundary are relatively stable.

6.3. Applications of carbon nanotubes

Carbon nanotubes can be made into composites with other materials. The composites made in this way are greatly improved in strength, elasticity and fatigue. And because of the tensile properties of carbon nanotubes, they can be used to make shock absorbers for vehicles.

6.4. Prospects and defects of carbon nanotubes

Because of its unique wall forming structure, carbon nanotubes have wall defects, and the wall defects can affect

the mechanical properties of carbon nanotubes. Moreover, the immaturity of carbon nanotube fabrication process will lead to a large number of STW types in carbon nanotubes. The immaturity of the manufacturing process has led to the high cost of carbon nanotubes, so the fabrication of inexpensive carbon nanotubes is still under the study of scientists. In 2009, Dr. Yang Zhi of the Hunan University developed a multi walled carbon nanotube with high efficiency.

7. Conclusion and Prediction

New materials are far more than these four, and the most widely used are new materials related to fiber, such as high strength, high modulus fiber, high heat resistant fiber, ultra-light fiber, high conductive fiber, biodegradable fiber and so on. Some of these fibers have been able to achieve large-scale production, such as high-strength, high modulus fiber, and its pride, our country has been able to achieve annual output of 30 tons.

Plastics are also a research direction of new materials, such as conductive plastics and composite conductive plastics. In other words, renewable materials are the main directions for scientists. However, for graphene, embedded fullerenes, and self-healing materials, these three materials, their common feature is the high cost. Because of the lack of refining technology, the three new materials can not be extracted with simpler techniques. They are rare and expensive, making them difficult to use in society even if they are of great use.

But the technology is always in progress, there is a new type of machine was invented, just this machinery can mass production of one of the new materials, by that time, our society will be another revolutionary change, and into a new material composed of the new society.

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