Technology Innovation and the Possible Path to Expand Consumer Demand in the Context of China’s New Normal Policy

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ABSTRACT
In China, inadequate consumer demand is an outcome of traditional economic growth mode, which used to overly depend on exports and investment. Since 2008, western states adopted trade protectionism which hinders China’s exports, exacerbates inadequate consumer demand, even hampers economic growth further in China. Based on the change of international situation and domestic economic problems, Chinese government put forward new normal economic development policy. It focuses on structural adjustment in supply side reform. Seen from the economic history of western states, it proved that industrial structure upgrade once became a major driven force to expand consumer demand, which also became a pushing factor to their economic growth. While in the process of industrial structure adjustment, measures of technology innovation such as internet plus, industrie 4.0 are becoming major force to ease the tension between supply and demand which seemed to be an inherent crux imbedded in free market mechanism. In the end, some useful proposals for cultivating new technique and pushing them into social production and consumption.

INTRODUCTION
Compared with the western states, China’s economic growth has been driven by exports and investment for a long historical time, and it became common in the world. Therefore inadequate consumer demand is a certain consequence of China’s economic growth mode. Whereas the problem of China’s insufficient domestic demand became even worse after the submortgage crisis broke out in 2008, which made a profound influence on China’s economic development in the future. Since 2008, western countries have widely adopted trade protectionism which hampered export of China’s product. Also it undermined one of the three driven factors that has been pushing China’s economic growth in the past years. Statistics shows that China’s economic
growth rate turned to a down trend in the late of 2008. GDP growth rate is 8.7 in 2010, 7.7 in 2013, 7.3 in 2014 and even 6.9 in 2015. See figure 1.

Meanwhile affected by global price fluctuation in bulk commodities, some of the China’s industries appeared a large amount of inventory backlog. And this situation bring China’s economy series tasks of de-stocking, reducing excess capacity and keeping growth rate, which have needed to be dealt with for the future China’s economy.

Aiming at above economic problems, Chinese government put forward a new economic development strategy called China’s economic transition in a new normal state. And new normal adjustment is giving high priority to economic structural adjustment and encouraging supply-side reforms in China’s economic development. Obviously, all these new policies are focusing on improving a situation arisen from inadequate demand that are inherent in traditional economic growth mode which has driven China’s economic growth with too much more of internal investment and external exports, and trying to find a new economic path which could balance the gap between supply side and demand side. In the process of searching new economic road in the context of new normal state, technology innovation will play an important role in it.

![GDP growth rate of China](image)

**Figure 1. GDP growth rate of China.**

**TECHNOLOGY INNOVATION AND MACRO PATH OF EXPANDING CONSUMER DEMAND: STRUCTURAL ADJUSTMENT AND SUPPLY SIDE REFORMS**

**Innovation: From Concept to New Production Function Combination**

Early last century, Austria scholar Joseph A. Schupter published his work with the title of the theory of economic development and proposed the concept of innovation. That innovation theory has been applied into different theoretical framework. In the view of western economic growth, technology innovation is treated as a new production function attributing to the economic growth. And its role is to enhance productivity in the production. In 1957, Solow published an article titled with technical change and the aggregate production function on the review of economics and statistics. In his article, he used mathematical expression to formulate the role of production function to the economic growth. In the formula of production function $Y=$
f (L, K, A), Y denotes aggregate output, f is an expression of function, L denotes labour input, K denotes capital stock, A is total factor productivity. Capital K and labour L are production input factor. And their productivity are associated with state of A. Namely is the bigger of A, the much of output at a same amount of capital and labour input. A is called total factor productivity affected by factors such as institutions, technical level and nature conditions, including all the rest of productive factor except capital and labour.

Based on above theoretical review, we know that new economic policies involving into structural adjustment and supply side reform are focusing on through structural adjustment to optimize output of supply side, eliminating parts of backward production capacity, shifting industries to the nascent and innovation industries, further driving China’s economy up to the rapid economic growth route.

**About the Contents of Supply Side Reforms and Structural Adjustment**

Arguments of structural adjustment in supply side has been treated as one of the effective tools for prospering national and regional economy after global financial crisis by European Commission. Peoples of European Commission believed that the main content of structural adjustment must include reform in labour market, tertiary industry liberalization, enhance business environment and competiveness in service industry, encourage innovation. And most of these measures are arguments belonging to supply side arrangement. In 2014, Varga and Veld gave all these measures a positive evaluation after making a quantitative analysis, believing all these measures has positive role to social aggregate output and employment which are especially to increase social output level in a long term.

Different with the arguments of European Commission, China’s supply side reform emphasis on supply side adjustment, demand side arrangement and control, which are aiming to find a balance in the contradiction of two sides. In China, structural adjustment in supply side reforms is composed of structure improvement in production factors, in three industries, and among main suppliers. Supply side reform in China are not only worked on reducing amount of supply, but also enhances efficiency of supply factors, promoting economic transition from traditional economic growth mode to the new one, realizing the task of balancing supply side and demand side and optimizing industrial structure.

As for the arguments of reforming in supply side, it will promote social aggregate consumption which has been from the experience of western industrial adjustment.

**MACRO STRUCTURAL ADJUSTMENT IN SUPPLY SIDE AND ITS LOGICAL ROUTE TO PUSH AGGREGATE CONSUMPTION EXPANSION**

The concept of supply side can be traced back to Say’s law in the early of 19th century. And Say’s law emphasized the role of supply to the social economy. It states that production can create an equal quantity of aggregate demand. Say’s law gave high attention to social aggregate supply. After the first global economic crisis,
Keynes’s theory began to emphasize demand side adjustment. And it became very popular in the western academic field. In the 1970s and 1980s, Keynes’s theory had caused a widely spread stagflation in the western advanced countries. Responding to this economic crux came the school of supply side in the academic field which also swept over western academic field for many years. Scholars of supply school believed that the sources of economic growth comes from increasing in supply, reducing tax and less government intervention, enhancing the utilization ratio of productive factors such as labour and capitals. In essences, supply side reform is trying to push up economic growth by adjustment in economic structure and social institution.

As a manifest of innovation, economic structural adjustment has once become a driven force to the economic growth for a certain developed western states with a higher economic increment. While we study on some of the advanced country in the process of economic growth, structure adjustment in the economy can be an effective driven force for the economic growth of a nation, which has been proven in the history of western economic development. Seen from the developmental history of western industrial structure, it had proved that industrial structure upgrade can be a source of economic increasing and also made consumer demand became a major factors driving to economic growth.

Taking America as an example, we can easily find the expansion of social aggregate demand is closed link to industrial structure adjustment. Since 1930s, consumer demand rose with the industrial structure upgrade and it also become an engine to economic growth rates. See figure 2 below, we find in 1950s, social consumption rate has reached up to 60%, before subprime crisis it was up to more than 70%. In 2013, it deceased to 68%. See Figure 2

![Figure 2. Consumption rate of the U.S.](image)

Consumer rate increases with economic growth and become a drive force, which has a close linked to the industrial structure adjustment. And the route of American industrial structure upgrading is becoming a regular path for other developed states to follow in. Its principal evolutionary route of industrial proportion is from first industry, second and tertiary industry in descending trend to that of tertiary, second and first industry. Accompanying with the industrial structure upgrade is the improvement in labour-intensive industry shifting to technology intensive industry. And industrial improvement has helped to complete transition of productive mode with high productivity and high add production value. And the advantage of primary product manufacturing has given ways to the middle and final product manufacturing. Taking
America as an example, in the early of 20\textsuperscript{th} century, the first industry accounted for 28\% of the total shares. In 1960s its shares were down to 4\%; in 1974 that was 3.3\%, and to 2008 that was 1.5\% of the total. The change of second industry among the total is from 53\% in the early of 20\textsuperscript{th} century down to the 15\% in 2010. As for the tertiary industry, it increased from 19\% in the early of 19\textsuperscript{th} century to 82\% shares in the year of 2010. And in the process of industrial structure upgrade, it is common to be seen that consumer demand are becoming a main factor to push up economic growth. See Chart below.

### Consumption rate of member states in G20 (2008).

<table>
<thead>
<tr>
<th>GDP (billion dollar)</th>
<th>G20 total</th>
<th>developed states</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>total</td>
<td>U.S</td>
</tr>
<tr>
<td>GDP</td>
<td>514,976</td>
<td>381,916</td>
</tr>
<tr>
<td>consumption/GDP (%)</td>
<td>59.0</td>
<td>62.3</td>
</tr>
<tr>
<td>investment/GDP (%)</td>
<td>23.0</td>
<td>20.5</td>
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</tbody>
</table>

Source: IMF database

Seen from above, in the process of supply side adjustment, one result of industrial structure upgrading in the western states are the increase in consumption rate. Following with this process is the expansion of the third industry which has been attracting more and more labour forces in the excess labour market. It creates more employment position and give more of attribution to the economic growth during the process of industrial structure improvement.

### TECHNOLOGY INNOVATION IN SUPPLY SIDE REFORM AND CONSUMER DEMAND EXPANSION IN MICRO ECONOMY

In the midst of industrial structural adjustment in the supply side reform of the western states, it follows the rule of efficiency priority. Namely is that a higher efficiency happened in a certain industry which led an expansion in that industry among the total industrial shares. While most of the efficiency enhancement is the consequences of technology innovation and its application into the social production. Owing to this, we can say that technology innovation is either the direction of industrial structure upgrading or the possible helpers to pull up the lower consumer demand in our society.

According to the formula of production function above, we know that total factor efficiency (A) is affected by the change in technology innovation and institutional reform. In terms of the former, internet plus as one of the manifest for internet technique which has been thinking as one kind of the update technical innovation applied into commercial exchange. Its roles appear somehow. Nowadays in China, internet plus is becoming a new possible technical path to improve the contradiction between supply and demand, in which it shows an overheat demand for investment in some of the productive industries belonging to supply side, such as over-demand for steel, cement in building material industry. Excessive investment in these industries
caused environmental pollution and inventory stock and excessive production capacity. On the demand side, consumer demand affected by imperfect system of social security and traditional customs of consumption, all that works together to curb consumption rate to rise and become a leading force to pull up economic growth in China.

While new technique and its application can be used as a new path to ease the tension from inadequate consumption of China. According to Marxism, the contradiction between supply and demand arises from information asymmetry in the free market. And it made producer to enlarge their productive scale at random. Since producers are very difficult to know the will and preference of consumer, let alone to predict the quantity wanted by consumers exactly. Leading by the price signals, producers make their decision which are timelag. It usually makes social quantity needed deviated from quantity wanted. And this contradiction is treated as an inherent and insurmountable problems along with capitalism, it also worked as a catalyst to push capitalism to evolve into advanced socialism which is a planned economical society.

In essence, internet plus and industry 4.0 are two forms of technology innovation which being as an embodiment of new techniques has been applied into social production and business service. Such kinds of new techniques are changing the role and significance between supplier and demander in the social production and business exchange activity, which bring a storm to change relationship between producer and consumer. Traditional economic crux like information asymmetry between producer and consumer in the free market can be possible solved by new techniques. And production and consumption as two separated productive stages involved into one process of manufacture, and which caused the information asymmetry or through intermediary business to improve their separated relationship. Now by new technique relating to the internet plus, the contradiction owning to the detachment in time and space between consumer and producer can be fixed up through new techniques and its application into social production and business exchange activity. Furtherly it make a more balance state in quantity between producer and consumer.

A fashionable product mode called C2F is an outcome of internet plus applied into production activity. It is also the cornerstone of industrie 4.0 innovative technique. The update technique is a product of manufacturing industry integrated with internet technique; that is a new form of technology revolution. And this integration brings us a possibility to make a product by want of consumers. Some fashionable expression such as customization, build to order (BOT) are the embodiment of manufacturing trend. In the future, industrie 4.0 will realize interconnection among producer, consumer, product information and business dates. Namely, it is by using some new information technique such as big data, cloud computing, internet of things, internet web, mobile internet and information network to realize manufacture by orders. And it will integrate the following factors—consumer demand, producer made, proceedings service—into one manufacturing process and management. Therefore, it is possible to wipe out quantity unbalance that comes from a separated time and space between consumer and producer in the process of manufacture.
SOME PROPOSALS FOR TECHNOLOGY INNOVATION AND ITS APPLICATION INTO EXPANDING DOMESTIC DEMAND

As a new form of technology innovation, we can find out that the roles of internet plus and industrie 4.0 in our production and consumption is growing up day by day. But there are still some hinderance for its development in China.

Institutional Arrangements on Consumer Behavior Are Still Based on Traditional Industrial Manufacture

And new arrangement and new system based on E-commerce and internet of things are still in booming and waiting for a new regulation. In terms of financial surveillance and promoting information flow, regulations and institutional arrangements relating to the areas that focus on transition and upgrade consumption mode are waiting for strengthen and improvement.

In our sense of spreading new technique in internet, our sense still in the early stage of information technology

As for new concept of cloud compting, big data, internet of things. And what those new concepts will bring changes in consumer mode are still lacking of attention. It means our sense has not shifted to a business pattern of consumer orientation.

The living environment of small and micro businesses has not improved in current China

Mini size businesser especially E-mini businesses are growing rapidly and becoming a main power to lead a transition in consumer pattern. While our government did not pay too much attention on the development of small and mini businesses. In the fields of finance and relating policies supporting, China’s large state-owned enterprises have different kinds of advantage and developmental priority. Small and mini business are getting less finance from national bank and less policy supporting which are owning to their vulnerable social position and weak credit ability in current China.

Shortage of skilled and trained labor forces in the field of E-commerce

Compared with labor force with less skilled, talents in internet plus are still cannot meet social demands in China. And talented employee training structure is not fit for rapid development of E-commence in China. Nowadays we are still short of talented people who are skilled in big data mining, E-commerce, mobile internet development, E-finance area.

Based on above problems, government as a major force to join in and push up economic development should care much about the following tasks.

Firstly, Transforming old mindset and realizing that internet related technique will be effective tools to increase consumer demand, resolve contradiction between producer and consumer in the future. Therefore, it will definitely become a new economic mode to push up China’s economic development from now on. Statistics shows that amount of E-commerce transaction is up to 12.3 trillion yuan in 2014,
increase by 21.3%. Among it, online shopping rose by 48.7%, online tour increased by 27.1%, online to offline (O2O) increased by 42.8%. These data illustrate consumer demand link to internet plus are growing faster in China.

Secondly, supporting small and mini businesses based on internet plus to builds up their careers. Normally, small and mini business are small size while has a strong will. It is full of innovation consciousness. We believe that small and mini business will have some innovation enterprises to surpass Baidu.com Company and Alibaba.com. And their existence will contribute to economic development in the future China. Therefore, Chinese government should follow the principles such as less intervention and more preferential policy in tax collection, market supervision and business administration for the development in the internet plus. To play a role as a industry incubator to help small and mini business grow bigger and stronger in future China.

Thirdly, developing industrial strategy based on cloud computing and internet plus. Compared with western advanced states, China’s new technical developments are getting behind of those in advanced states. In current China, big data, internet of things, cloud computing are just new concepts instead of new techniques application into social society. While so called such kinds of techniques has been wildly used into finance, medical care and transformational areas. The reasons for them have not spread over our social practices is that the hardware and infrastructures cannot catch up with the rapid developmental speed of internet web system. And government interventions are still too much there in our society, traditional economic growth pattern has not been broken up. Department and regional segmentation still existence in there. All these problems need government to guide and even wipe out to pave for new internet technique to be developed in the future China.

REFERENCES