



**Transformation of Efficiency Driven to Innovation Driven  
Economy of China**

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### **Abstract:**

The basic intention of this research was to understand, how economic transformation of china is possible through three efficiency enhancers of Global competitiveness index (GCI) namely Market efficiency, Higher education & Training & Technological readiness. China is trapped into middle income category since 2005 and if china needs to catch up with the developed countries, it needs to jump up into higher economic development category. Until 2015, China was the world's fastest-growing major economy with growth rates averaging 10% over 30 years, until it was surpassed by neighboring India in 2016 (Farooq, 2016). The growth rate released by the Chinese government work report in 2017, estimated Chinese growth rate to be 6.5% for the year 2017 as announced by the premier of China in National People's Congress. (Xinhua, 2017). The research has used NCA (National Competitiveness Advantage) theory (1990) by porter in which he argued that national competitiveness is based upon factor conditions; those are general sets of factors that make a nation competitive. These factors can be anything from human resources and material resources to infrastructure and the quality of research at universities. The research is quantitative in nature with deductive approach using questionnaire to collect data from 292 master degree students from four universities namely, Guangzhou University, Jinan University, Sun yet San University and South China University of Technology. The data was then analyzed through SPSS software. It was found during the research that, when asked about the free market mechanism being supportive for market efficiency, 225 out of 292 participants agreed with the idea, when asked regarding the independent central bank being the market efficiency improver in china, 200 out of 292 participants agreed with the point. When asked regarding the experiential teaching pedagogy impact on innovation in china, more than 200 participants agreed with the concept. When asked regarding the innovation induced curriculum and its role for the economic transformation of china, almost 200 participants nodded their heads in agreement. Finally, when inquired regarding the impact of all three efficiency enhancers on the economic transformation of china, 200 out of 292 agreed with the relationship. This kind of association was also found between each independent and dependent variable. It was found to have weak relationship between market efficiency, technological readiness and Chinese economic transformation, while it was discovered to have moderate kind of relationship between higher education & training and Chinese economic transformation. Therefore, it is concluded through this research that if china has to move up in the economic ladder and break the middle income trap that, it is

in since 2005, it has to focus on improving at least three GCI pillars namely, market efficiency, higher education & training and technological readiness.

**Keyword:** Social Capital, Family Networking, Friends Networking, Relationship, Quantitative, Business Graduates



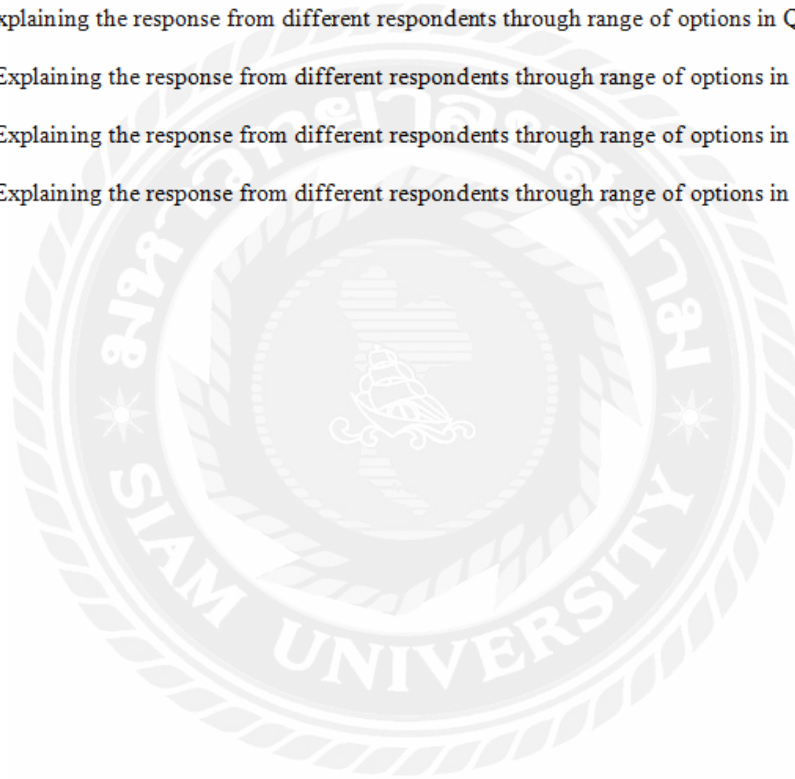
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## **Chapter 1: Introduction**

### **1.1 Introduction:-**

The purpose of this study is to understand how china can transform its current economic state that is efficiency driven into innovation driven economy as China is regarded efficiency driven economy by Global competitiveness index. China's socialist market economy is the world's second largest economy by nominal GDP and the world's largest economy by purchasing power parity according to the IMF, although China's National Bureau of statistics rejects this claim. Until 2015, China was the world's fastest-growing major economy with growth rates averaging 10% over 30 years, until it was surpassed by neighboring India in 2016 (Farooq, 2016). The growth rate released by the Chinese government work report in 2017, estimated Chinese growth rate to be 6.5% for the year 2017 as announced by the premier of China in National People's Congress. The report mentioned that the projected target is in line with both economic principles and realities, stressing that it will help stabilize market expectations and facilitate the country's structural adjustments (Xinhua, 2017). According to Porter national competitiveness model (1990) there are three stages of economic development, factors driven economy, efficiency driven economy and innovation driven economy. After 1979, China initiated its growth process by using its natural resources, huge amount of land and vast pool of unskilled cheap labor and basic infrastructure to produce cheap price competitive products that requires basic technological advancement; this was the time when china was agrarian economy (Wu, 1997). It moved unprecedented onwards towards factors driven economy with double digit growth rate from 1983 till 2010. China initiated open door policy in 1979 under which it builds Special Economic Zones (SEZs) and Open cities where MNCs and other foreign corporations can access cheap land, electricity and other public utilities with tax incentives in order to become competitive in the international market(Beule & Bulcke, 2005). FDI inflow increased from less than \$200 million in 1980(y-o-y) to \$44.9 billion until 1997(y-o-y) - an increment of 225 times. It accumulated FDI stock of \$579 billion until 2010. China received \$13.3 billion inward FDI in

2012(Bano & Tabbada, 2012). FDI has been declining since December 2015 and this shows that Chinese economic structure needs revision and modification (Economic Times, 2016). China was considered a low income country until 1998 as per GNI (PPP) method by World Bank but then it was included as middle income country in Global competitiveness index 2000(World Bank, 2014). From then onwards, China is considered middle income and then upper middle income country but it's trapped in middle income category for a quite long. So now the question arises why it's in middle income country as Singapore and Taiwan and even Middle Eastern countries like Oman and Qatar have left that group and moved to advanced economy group. According to Global Competitiveness index (GCI) index 2005-06, there were 9 pillars as termed Institutions, Infrastructure, Macroeconomy, Health and primary education, Higher education and Training, Market efficiency, Technological readiness, Business sophistication and innovation. China was ranked on 54<sup>th</sup> position in GCI (2006-07) with institutions ranked 80<sup>th</sup>, health and primary education 55<sup>th</sup>, higher education and training 77<sup>th</sup>, Market efficiency 56<sup>th</sup>, Technological readiness 75<sup>th</sup>, Business sophistication 65<sup>th</sup> and innovation 46<sup>th</sup> position. Now let's compare these pillars with GCI 2016-17, China is ranked 28<sup>th</sup> in 2016-17 global competitiveness index as same as last year 2015-16. Institutions are ranked 45<sup>th</sup> nine points above last year but still quite lower than its nearby country Taiwan 30<sup>th</sup>. Health and primary education 41<sup>st</sup>, three points better than last year, 14 points better in 11 years. Market efficiency was similar to last year and reached at 54<sup>th</sup> but, it also means that Chinese market efficiency remained similar in last 11 years. Higher education and training got 54<sup>th</sup> rank, amazingly 14 points better than last year and 23 points better in 11 years, this seems to be tremendous progress in higher education sector in china in last 11 years. Last but not the least, Technological readiness ranked at 74<sup>th</sup> as similar to last year and just one point lower in 11 years. Business sophistication ranked at 34<sup>th</sup> four points better than last year and innovation at 30<sup>th</sup> one point better than last year (Schwab & Porter, 2006-07, Schwab, 2016-17). In this situation, by considering all the factors of GCI, this research has chosen three factors necessary for the Chinese transformation as Market Efficiency, Technological Readiness and Higher Education & Training in

order to find out how these three can contribute in the transformation of Chinese economy from efficiency driven to innovation driven economy.

## **1.2 Chinese Context:-**

China has grown rapidly after 1979 reforms for three decades until 2010 but now, china is slowing down because of its economic model, it chooses to follow, and that seems to have problems, therefore, it no longer serves the country in its best interest. China has to change its policies, priorities and the economic model it used to follow in the past. China in this situation of reaching lower than 7% growth rate for two consecutive years, need to emphasize on the private sector playing a key role in economy, technology being at the forefront and institutions playing the key role for the development. The country's economy has accumulated an abundance of resources, it has gained financial influence, and it has also established effective decision making within the country as well as an increasingly more influencing role outside the country. Moreover, the current economic slowdown additionally offers the possibility to pause for a moment, reflect past developments and make possible corrections (Schnorpfeil et al, 2016). China needs to stimulate the idea of consumption based growth and service oriented economy. According to Porter (1990), if nations would like to be competitive, they need to find factors based on them, they can compete in domestic and international arena and china is losing those factors and if china needs to remain competitive, it needs to change those factors in order to remain competitive. According to latest figures of GCI (2016-17), China is still lagging behind in business sophistication and innovation ranking, the two parameters; those are used to define innovation-driven economy than Taiwan, Singapore and other East Asian countries like Hongkong and South Korea. China has to improve its institutions and market efficiency in order to provide the basis for future economic growth and development. Moreover, Economic development is a process that requires radical changes from public and private sector to change its direction. As economy moves to higher ladder, less technological intensive products and semi-skilled workforce would be obsolete so China needs huge ramification in its human resource development and product

selection that will take China towards higher ladder of economic development. According to global entrepreneurship index 2015 (GEI), China is ranked 61 out of 130 countries list and its ranked 9<sup>th</sup> even in regional ranking. According to global talent index 2015, China is positioned at 87<sup>th</sup> out of 134 countries. According to Global creativity index 2015, China is ranked at 62<sup>nd</sup> position. According to ease of doing business index, China is ranked at 90<sup>th</sup> position from 189 economies.

### **1.3 Problem Statement:-**

Chinese economy is mainly based on three pillars, export of products, investment in fixed assets and consumption. Chinese exports of goods and services as a percentage to GDP have been declining since 2010. It means that china is not getting enough as it used to be due to sluggish world demand. But china has huge internal domestic market of 1.3 billion? Interestingly, Chinese imports have been declining as well and domestic consumption is also slow. So now Chinese economy can only move with big push from the government investment. Government of china was investing heavily in its fixed assets projects from last 15 years (2000 onwards) but from last year it also seems reluctant to pour more money in the ditch. As economic development theories suggest that investment led growth is not sustainable in the long run as it always needs external force to push the economy. Consumption led growth and investment by private entities is the only way for long term economic sustainability. Therefore, This study will analyze three GCI pillars namely Higher education training, Technological readiness and Market efficiency in order to find out how these pillars can contribute in future economic development of China and explain their role in order to take Chinese economy from its current position to the higher ground.

### **1.4 Main Theory of this Research:**

This research is based on Porter's National Competitive advantage (NCA) theory, NCA is basically an evaluation of how competitively a nation participates in international markets. It explains the impact of domestic business environment on national competitiveness. Porter offers a diamond-shaped diagram to outline the

framework of four key factors that can modify four ingredients to become more competitive. The four ingredients are the availability of resources, the information used in deciding which opportunities to pursue for the company, the goals of individuals in companies, and the innovation and investment pressure on companies. He proposed this theory in his book “The Competitive Advantage of Nations”. He argued that factor conditions are general sets of factors that make a nation competitive. These factors can be anything from human resources and material resources to infrastructure and the quality of research at universities. Although a nation may have an abundance of factor conditions (i.e. low-cost labor and lush vegetation), the usage of these factors is more important than their mere existence. He further mentioned that there are three stages of economic development namely, factors driven economy, efficiency driven economy and innovation driven economy. Factors driven economy needs basic ingredients like basic production infrastructure, land and huge cheap labor in order to produce cheap products so the competitive advantage of nation lies in price not quality. In investment driven economies, national competitiveness is based on the state’s willingness to invest aggressively with the use of new technologies acquired from abroad (through the purchase of licensing or joint ventures). The competitiveness of local firms is based not only on factors of production, but also on more advanced business strategies as this can be seen in China and Thailand. The highest level of development of national competitiveness is the innovation-driven phase. At this stage of economic development competitiveness is based on innovation, unique business strategies of domestic companies and on globally recognized products and brands. Significant outward foreign direct investments emerge at this stage, as domestic companies seek to exploit their competitive advantages abroad (Porter, 1990, p. 552, 554).

### **1.5 Hypothesis:-**

H1= whether there is a relationship between market efficiency and transformation of Chinese economy?

H2= whether there is a relationship between quality of higher education and training and Chinese economic transformation?

H3= whether there is a relationship between technological readiness and transformation of Chinese economy?

### **1.6 Objectives of the Study:-**

1. To understand and elaborate the role of market efficiency in Chinese economic transformation that may lead china towards future economic development
2. To contemplate the role of qualitative higher education and training with regards to economic transformation of china
3. To find out technological readiness of Chinese society from the societal and institutional point of view and its impact on Chinese economic transformation

### **1.7 Three Independent Variables:-**

1. Market Efficiency
2. Higher Education & Training
3. Technological Readiness

#### **1.7.1 Market Efficiency:-**

Fama (1970) defined an efficient market as one in which prices always 'fully reflect' available information. The efficient markets hypothesis (EMH) or commonly known as "Random walk Theory" suggests that price of any security, good or asset depends on the quality of the information and that is why, right value at right time is difficult to judge. It further elaborate that profiting from predicting price movements is very difficult and unlikely. The main engine behind price changes is the arrival of new information. A market is said to be "efficient" if prices adjust quickly and, on average, without bias, to new information. As a result, the current prices of securities reflect all available information at any given point in time. Consequently, there is no reason to believe that prices are too high or too low. Security prices adjust before an investor has time to trade on and profit from a new a piece of information. The key reason for the existence of an efficient market is the intense competition among investors to

profit from any new information. The ability to identify over- and underpriced stocks or assets or commodity is very valuable (it would allow investors to buy some stocks for less than their “true” value and sell others for more than they were worth). Consequently, many people spend a significant amount of time and resources in an effort to detect mis-priced commodities/stocks/assets. The most crucial implication of the EMH can be mentioned in a slogan called “Trust market prices”. Because, at any point in time, prices of securities/assets/commodities in efficient markets reflect all known information available to investors. There is no room for fooling investors, and as a result, all investments in efficient markets are fairly priced, i.e. on average investors get exactly what they pay for (Clarke et.al, 2000). The EMH’s concept of informational efficiency has a Zen-like, counter-intuitive flavor to it: the more efficient the market, the more random the sequence of price changes generated by such a market, and the most efficient market of all is one in which price changes are completely random and unpredictable. This is not an accident of nature, but is in fact the direct result of many active market participants attempting to profit from their information. When it is driven by profit opportunities, an army of investors pounce on even the smallest informational advantages at their disposal, and in doing so they incorporate their information, into market prices and quickly eliminate the profit opportunities that first motivated their trades. If this occurs instantaneously, which it must in an idealized world of ‘frictionless’ markets and costless trading, then prices must always fully reflect all available information (Lo, 2000).

### **1.7.2 Higher Education & Training:**

Higher education plays a necessary and an increasingly important role in human, social, and economic development (Sutton 1998; Escrigas 2008). The role of higher education institutes (HEIs) in development is vital and it is also complex, fluid and dynamic. HEIs exhibit numerous different capabilities and scope, and can affect processes of development both directly and indirectly through teaching, research and service (Thomson, 2008). HEIs promote scientific innovation through research and it is an important component that drives economic growth and increases knowledge and



understanding. Therefore, Pyle and Farrant (2002) documented how Research & Development (R&D) at the Lowell Centre, and other universities, sustained development in the USA at a certain point in time. It is further elaborated that research at HEIs plays an indispensable role in development, although a very complex and perhaps an indirect one (Vessuri 2008). But it is analyzed that research not only creates and increase knowledge and ways of understanding, but research also informs policy decisions. In that situation, research is important for the independent development of an institution itself, as well as for government policies. Therefore, whether conducted for specific purposes (action research) or as an academic pursuit by policy makers or academics, research has an impact on all areas, especially in the context of human and social development (Thomson, 2008). Taylor (2008) mentioned that research is considered to be a very essential part of the role of HEIs. It is also true that globalization has increased economic competition within and between countries and the world's regions. Therefore, economic competitiveness is commonly seen as a valid index for judging a country's level of economic prosperity. Hence, many recent large-scale education reforms have been justified by the urgent need to increase labor productivity and promote economic development and growth through expanded and improved education. Therefore, it is generally assumed that to increase economic competitiveness, citizens must acquire knowledge, skills and attitudes necessary for civic success and the knowledge-based economy (Sahlberg, 2006). This is also confirmed through different studies that people are considered as human capital and it demonstrates that, how increased investment in people's knowledge, skills and health provides future returns to the economy through increases in labor productivity (Bils & Klenow, 2000; Cohen & Soto, 2001; Hanushek & Kimko, 2000; Krueger & Lindahl, 2000). Moreover, better quality education increases average earnings and productivity and reduces the likelihood of social problems that, in turn, are harmful for economic development (Sahlberg, 2006).

### **1.7.3 Technological Readiness:**

It is found in the literature on the role of technology being at the core of economy that sustained and significant growth in average world per capita income started roughly with the first era of the industrial revolution as it dates back that era (Jones, 2005). There is little doubt that technological progress through process innovations played the key role in initiating, accelerating, and sustaining economic growth in the modern era (Mokyr, 2005). But, the growth through capital accumulation, investment in physical resources and process innovation is fading in some countries because; the fundamentals of economics are not static but dynamic in nature. Therefore, according to neoclassical growth theory, long-run growth in income and physical capital per worker is entirely driven by productivity growth (Grossmann & Steger, 2007). Innovation and technology transfer are the key drivers of economic growth in today's world economy and thus, an appropriate economic policy should concentrate on strengthening these processes throughout the country and easing the flow of information and technology between the main players (e.g. innovators, companies, state agencies and financial institutions). It is also analyzed that structural changes of the entire economy are almost not possible without an effective technology transfer and well-defined country's innovation system. These two factors led the spectacular improvement in competitiveness and economic success of the newly industrialized economies (Gurbiel, 2002). It is also found in the Deloitte report on value of connectivity in 2014 that internet connectivity has already changed many aspects of the lives of individuals in developed economies and provided far-reaching economic and social benefits for developing countries. It is also crucial to extend these opportunities to accelerating economic and social growth in developing economies, while enabling the transition from a resource-based to a knowledge-based economy. It is also argued that importance of international technology transfer (ITT) for economic development can hardly be overstated. Furthermore, both the acquisition of technology and its diffusion foster productivity growth. As invention and creation processes remain overwhelmingly the province of the OECD countries, most developing countries must rely largely on imported technologies as sources of new productive knowledge. However, considerable amounts of follow-on innovation and

adaptation occur in such countries. Indeed, these processes effectively drive technological change in developing nations (Hoekman et al, 2004)

### **1.8 Significance of the Study:**

China economic growth has slowed down since 2010 from 10.4% to 6.5% in 2017, almost 40% reduction in growth rate in seven years, this indicates that china needs to change its focus, improve its competitiveness and manage to compete with the developed countries instead of developing countries in capital goods and etc. The unemployment rate is also on the rise since 2010 and it is in the double figure now. China is expected to produce 7.95 million graduates in 2017 and according to Chinese government; there would not be enough jobs to accommodate all these graduates (Xinhua, 2016). It is also found that Chinese exports dropped 7.7 percent on-year, the worst fall since 2009 and imports declined 5.5 percent. Therefore, china has trade surplus of \$509.96 billion in 2016 and in Yuan terms, 2016 exports dropped 2 percent on-year, while imports picked up 0.6 percent. This shows that the indicators especially the economic ones are not favorable for china since 2010. This is because the economic model, china has used so far is not working in its favor anymore. China needs to put more efforts on creative education, innovation, institutional building and internet access in order to move up in the economic ladder and become the knowledge economy in order to reap the gains from those changes sooner or later. This study is crucial in a sense that, it will take three pillars of global competitiveness index (GCI) and evaluate whether by improving on these three, china can transform its economy and improve its economic landscape in the future.

### **1.9 Scope of the Study:**

The topic of economic transformation of china is so broad so, it is not possible for this study to cover all the factors affecting on the economic transformation of china. Therefore, this study has only chosen three pillars of GCI namely market efficiency, higher education and training and technological readiness. It will not cover other pillars like institutions and business sophistication, those are possibly necessary to take into account for the economic transformation of china from efficiency driven

approach to innovative driven one. This research has also accumulated the opinion of small number of participants those having relevant knowledge regarding the subject at hand. This research has also focused on economic dimension but the real transformation to happen, social and political changes are also be included in the equation.

#### **1.10 Limitations of the Study:**

1. This study has only covered a small number of factors affecting on economic transition of china
2. This study has used only four universities of china for their students input regarding the subject, so it can't be generalized on whole china
3. The study has just cover 3 pillars out of 9 pillars of GCI so, their impact on the economic competitiveness is also not much larger and hence, their impact on economic transition
4. The study has just chosen one geographical area for its research because of financial constraints and difficulty of access due to remoteness
5. The study has not included the top management of public and private enterprises, government agencies or international experts due to time and financial constraints.

## **Chapter 2: Theory and Related Research**

This chapter will shed light on the literature and theories, research works related to the transition economies and how the transformation of an economy in this case, Chinese economy is possible through analyzing different experiences from different economies around the world. It will also take into account the Chinese historical economic background briefly but, it will mainly focus on the subject at hand.

It will include the following topics:

2.1 Background of the Study

2.2 Chinese Historical Development

2.3 Economic Competitiveness

2.4 Economic Transition

2.5 Contribution of Market Efficiency for Chinese Economic Transformation

2.6 Contribution of Technological Readiness for Chinese Economic Transformation

2.7 Contribution of Higher Education & Training for Chinese Economic Transformation

2.8 Conceptual Framework of the study

### **2.1 Background of the Study:**

China's economic growth has been evaluated at 6.5% this year, 0.20% lower than 6.7% in 2016. It is also estimated that industrial output could grow 5.9% this year, down from an estimated 6.1% in 2016. It is also discussed in Chinese government circles that authorities should increase the role of the market in formation of the Yuan exchange rate, increase the currency's flexibility and even conduct a one-off devaluation of the renminbi, and thereby maintaining renminbi stability at a balanced level. The Yuan fell nearly 7% last year and that was its biggest annual loss against the dollar since 1994 because it was under pressure from sluggish economic growth and a strong dollar. China's last one-off currency devaluation, a 2% move in August 2015, shocked global markets and was widely viewed by traders and economists as a failure. Capital outflows have been a growing concern for the government in the past year as it attempted to put the economy back on track and keep the currency stable

without exhausting its reserves, which tumbled to \$3.052 trillion in November 2016, the lowest in almost six years (Ruwitch et al, 2017). It was quite true in the past for Chinese economy that it was a slow moving economy similar to or little better than competitors with a lot of people living below the poverty line in 1960s and 1970s as china was the most populated country in the world. Before 1979, China maintained policies that kept the economy very poor, stagnant, centrally-controlled, vastly inefficient, and relatively isolated from the global economy. But this all changed when prime minister cum politician cum statesman Deng Xiaoping initiated vast economic reforms and opened its economy for globalization and international trade; this all happened after the death of Mao Zedong- a revolutionary leader of china. Mainly china had two factors that initiated the huge economic development, large pool of cheap labor and land. As according to basic economics, three factors are needed for production, labor, land and capital. The capital came from abroad in a similar fashion of resource exploitation as in South Korea, Singapore and Taiwan in their earlier phase of development (IBP, 2015).

The central government under the leadership of Deng Xioping initiated price and ownership incentives for farmers, which enabled them to sell a portion of their crops on the free market. In addition, the government established four special economic zones along the coast for the purpose of attracting foreign investment, boosting exports, and importing high technology products into China. Additional reforms, which followed in stages, sought to decentralize economic policymaking in several sectors, especially trade. Economic control of various enterprises was given to provincial and local governments, which were generally allowed to operate and compete on free market principles, rather than under the direction and guidance of state planning. In addition, citizens were encouraged to start their own businesses. Additional coastal regions and cities were designated as open cities and development zones, which allowed them to experiment with free market reforms and to offer tax and trade incentives to attract foreign investment. In addition, state price controls on a wide range of products were gradually eliminated. Trade liberalization was also a major key to China's economic success. Removing trade barriers encouraged greater

competition and attracted FDI inflows (Morrison, 2015). Since the economic reforms beginning in the late 1970s, the central government has shifted its development strategies toward more labor intensive sectors, initially agriculture, and then increasingly export-oriented rural industries. In the global context, China possesses an obvious comparative advantage in the labor-intensive manufacturing sector. After introducing the open door policy, massive foreign direct investment flowed in and married with China's cheap labor. As a result, both capital and labor resources were more efficiently allocated, which greatly boosted economic efficiency (Headey et al, 2008). China's development path therefore reemphasizes the importance of adhering to comparative advantage in creating labor-intensive, export-oriented economic growth (Krueger 1978, Krueger 1983, Krueger 1984, Little et al. 1970). According to Porter competitiveness advantage theory (1990) in which he argues that nations grow and develop their economy because of having comparative advantage of some sort and further argued by saying that "National prosperity is created, not inherited, It does not grow out of a country's natural endowments or its interest rates, or its currency's value, contradicts the conventional wisdom of early economists. But it is created through capacity of its industry to innovate and upgrade". Companies gain advantage against the world's best competitors because of pressure and challenge. They benefit from having strong domestic rivals, aggressive home-based suppliers and demanding local customers. He further argued that companies achieve competitive advantage through acts of innovation. They approach innovation, in its broadest sense, including both new technologies and new ways of doing things. They perceive a new basis for competing or find better means for competing in old ways. Innovation can be manifested in a new product design, a new production process, a new marketing approach, or a way of conducting training (Porter, 1990).

This research is based on the idea promulgated by Porter in 1990s that countries have comparative advantage as its industry becomes more competitive through innovation. Therefore, it could be seen from the recent past of Chinese export statistics that, the demand for its products is decreasing. So, this is a sign for Chinese economy to shift its focus on competitiveness through radical and incremental innovation in higher

education & training, better market efficiency through institutional mechanism, effective infrastructure and technological advancement.

## **2.2 Chinese Historical Development:**

In 1949, the newly established People's Republic of China designed and carried out economic development policies that led to an annual average economic growth rate of about 4 percent from 1953 to 1978, among the highest in the developing world at the time. In 1978, China began post-Mao economic reforms that have since achieved per capital economic growth of 8 to 10 percent annually, among the highest rates in economic development history. Studies of China's respectable 1949-1978 economic growth, as well as its dramatic post-1978 economic expansion, have pointed both to domestic and to global factors to explain China's post-1949 economic growth (Cheremukhin et al, 2014). Domestic factors include the People's Republic of China's (PRC) economic development policies, high savings rates, government control of investment capital, Chinese Confucian culture, and the lessons from Chinese experiences with the pre-1949 global economy. Good social capital in the form of a huge pool of healthy, basically literate, and motivated low wage workers has also been cited as an important factor in China's post-1978 economic development(Thomas, 2007).Global economic factors, crucial for China's post-1978 growth, include global economy trade opportunities, foreign investment, foreign advice, foreign loans, export-lead development opportunities, export processing zones, investment and assistance by Chinese from Hong Kong and other parts of "greater China," and the examples of successful export-led economic development by Japan and by the four Asian "tigers" (Hong Kong, South Korea, Singapore, and Taiwan) (World Bank, 1997).

The rapid rise of China as a major economic power within a time span of about three decades is often described by analysts as one of the greatest economic success stories in modern times. From 1979 (when economic reforms began) to 2011, China's real gross domestic product (GDP) grew at an average annual rate of nearly 10%.<sup>1</sup> From



1980 to 2011, real GDP grew 19-fold in real terms, real per capita GDP increased 14-fold, and an estimated 500 million of people were raised out of extreme poverty (Boukraa, 2013). China is now the world's second largest economy and some analysts predict it could become the largest within a few years. Yet, on a per capita basis, China remains a relatively poor country (Morrison, 2012). Some economic predictors project that China will overtake the United States as the world's largest economy within a few years, although U.S. per capita GDP levels are expected to remain much larger than that of China for many years to come. However, the ability of China to maintain a rapidly growing economy in the long run will depend largely on the ability of the Chinese government to implement comprehensive economic reforms that more quickly hasten China's transition to a free market economy; rebalance the Chinese economy by making consumer demand, rather than exporting and fixed investment, the main engine of economic growth; and boosting productivity and innovation (Morrison, 2015). China faces numerous other challenges as well that could affect its future economic growth, such as widespread pollution, growing income disparities, an undeveloped social safety net, and extensive involvement of the state in the economy. The Chinese government has acknowledged that its current economic growth model needs to be altered. In October 2006, the Chinese government formally outlined a goal of building a "harmonious socialist society" by taking steps (by 2020) to lessen income inequality, improve the rule of law, enhance environmental protection, reduce corruption, and improve the country's social safety net (such as expanding health care and pension coverage to rural areas). In addition, the government announced plans to rebalance the economy and boost innovation (Morrison, 2012). Recent economic development history provides compelling proof of innovation playing a crucial role in the catching up endeavor of emerging economies and in their successful avoidance of the middle income trap (Pancea & Balgar, 2016). Porter (1990) identified four stages of economic development in a nation's evolution namely, factor-driven development, investment-driven or efficiency driven development, innovation driven and wealth-driven development. In the case of china, the old investment-led and export-oriented development model in

china has covered both the factor-driven and the investment-driven development stages. Therefore, it is quite necessary now to help rebalance its economy and ensure sustainable growth, China needs to more firmly advance towards the stage of innovation-led growth. Even if it managed a spectacular economic revival and re-emergence at the top of the world economic rankings building upon manufacturing, in terms of knowledge creation, research, development and innovation, China is still a follower, not a leader, and it still has a long way to go before it becomes an innovation-driven economy and a genuine new technology provider (Pencea, Bâlgăr, Bulin, 2015).

### **2.3 Economic Competitiveness:**

A nation's competitiveness is the degree to which it can, under free and fair market conditions, produce goods and services that meet the test of international markets while simultaneously expanding the real incomes of its citizens. Competitiveness at the national level is based on superior productivity performance and the economy's ability to shift output to high productivity activities which in turn can generate high levels of real wages. Competitiveness is associated with rising living standards, expanding employment opportunities, and the ability of a nation to maintain its international obligations. It is not just a measure of the nation's ability to sell abroad, and to maintain trade equilibrium (The Report of the President's Commission on Competitiveness, 1984). Competitiveness is also defined as the degree to which, under open market conditions, a country can produce goods and services that meet the test of foreign competition while simultaneously maintaining and expanding domestic real income (OECD Programme on technology and the Economy, 1992). According to Porter's National Competitive advantage (NCA) theory, NCA is basically an evaluation of how competitively a nation participates in international markets. It explains the impact of domestic business environment on national competitiveness (Martin, 2000). Porter offers a diamond-shaped diagram to outline the framework of four key factors that can modify four ingredients to become more competitive. The four ingredients are the availability of resources, the information used in deciding

which opportunities to pursue for the company, the goals of individuals in companies, and the innovation and investment pressure on companies. He proposed this theory in his book "The Competitive Advantage of Nations". Factor conditions are general sets of factors that make a nation competitive. These factors can be anything from human resources and material resources to infrastructure and the quality of research at universities. Although a nation may have an abundance of factor conditions (i.e. low-cost labor and lush vegetation), the usage of these factors is more important than their mere existence (Porter, 1990). He also mentioned the importance of geographic concentration of companies, which improves cluster's work, but he did not explicitly include a space dimension in his original definition of clusters (Porter, 1990). But however, after did Porter emphasize that the competitive advantages in global economy can be localized to a great extent and that they are derived from the concentration of highly specialized skills and knowledge, institutions, rivalry and sophisticated buyers( Porter, 1998, p. 5). He defined clusters as geographically concentrated and interconnected companies with specialized suppliers, service providers that operate in similar industry and that co-operate with the institutions, such as: universities, various agencies and trade associations; in certain areas where they compete, but also co-operate. Although Porter's approach contributed to the popularization of regional economy, it was not perfect and the critics quickly appeared (Porter, 1988). Although Krugman didn't buy that porter's idea but he was well in line with Poot. Poot (2000) and Krugman (1994) claimed that there is a strong competition in free market conditions and globalization, but that implies only companies, not regions or nations. That means that competition between regions is not a zero-sum game with a sole winner. This competition game primarily relates to economic subjects' actions, taken to enhance living standard of a specific locality, region or country. Finally, Porter (2004) acquired the hypothesis that competitiveness is not a zero-sum game, since many countries can enhance their productivity:

The competitiveness of an economy is generally considered to be a key economic policy priority (Oliva, 2014). The fundamental goal of economic policy is to enhance competitiveness, which is reflected in the productivity with which a nation or region

utilizes its people, capital, and natural endowments to produce valuable goods and services. High and rising productivity, measured by the value produced by a day of work, determines the level of wages that a nation can sustain and its standard of living in the medium and long run. Economic policy to enhance competitiveness, especially at the Federal level, has traditionally focused on opposite poles. On one extreme, policymakers have sought to improve the general business environment that affects all firms. This occurs through policies such as macroeconomic stabilization, tax policies to encourage saving, investments in basic R&D, public support of colleges and universities, infrastructure investments, and antitrust regulations. On the other extreme, policies have sought to benefit the competitiveness of individual firms and workers. There are many such policies, including loan guarantees from the Small Business Administration and the Export Import Bank, technical assistance programs, training support for qualifying workers, procurement policies targeting small businesses, and SBIR grants (Porter, 2007).

A nation is competitive if it creates the conditions where two things occur simultaneously, first businesses operating in the nation can compete successfully in domestic and international markets, second while, maintaining and improving the wages and living standards of the average citizen. When these two occur together, a nation prospers. When one occurs without the other, a nation is not truly competitive and prosperity is not sustainable. If business succeeds but the average worker is losing ground, or when worker incomes rise but businesses can no longer compete, the nation is not competitive. A hallmark of a competitive economy, then, is prosperity that is widely shared. And without successful businesses, there can be no jobs and no long-run income growth (Porter et al, 2016). Usually, the competitiveness is defined at two levels: micro level and macro level. When it is defined at micro-economic level there exists a reasonably clear and straightforward understanding of the notion of competitiveness based on the capacity of firms to compete, to grow, and to be profitable. At this level, competitiveness resides in the ability of firms to consistently and profitably produce products that meet the requirements of an open market in terms of price, quality, etc. Any firm must meet these requirements if it is to remain in

business, and the more competitive a firm relative to its rivals the greater will be its ability to gain market share. Conversely, uncompetitive firms will find their market share decline, and ultimately any firm that remains uncompetitive will go out of business. This is by comparison, at the macro-economic level the concept of competitiveness is much more poorly defined and more strongly contested. Despite the fact that improving a nation's or region's competitiveness is frequently presented as a central goal of economic policy, arguments abound as to precisely what this means and whether it is even sensible to talk of competitiveness at a macro-economic level at all. The lack of a commonly accepted definition is in itself one source of opposition to the concept of macro-economic competitiveness; essentially the argument is that it is dangerous to base economic policy around such an amorphous concept which admits of diverse interpretations and understanding (Martin, 2004). Competitiveness and productivity go hand in hand as it is described by Adam Smith in 1776 under his classical economic theory.

Smith argued that investment in capital (improved machinery) and trade (increasing the size of the market) facilitates this specialization and raises productivity and output growth. Moreover, growth itself could be reinforcing, since increasing output permits further division of labour and hence further growth. Smith (1776) mentioned in terms of trade that gains from trade to be made when moving from a situation of autarky to free trade when countries have an absolute advantage in the production of different goods. If one country can produce goods using less inputs (labour) in production then it will have an absolute advantage and should export the good; or alternatively countries should import goods that others can produce using fewer inputs (i.e. where they are produced most cheaply). Thus trade is attributed to (absolute) differences in productivity. Although in compliance, David Ricardo (1817) mentioned that gains from trade could be made when two countries actually specialize in the production of goods for which they have a comparative advantage. In his model, production technology differences across industries and across countries give rise to differences in comparative labour productivity (i.e. output per worker). According to his 'two countries two goods representation', even though workers in one country are more

productive in the production of both goods (i.e. have an absolute advantage in both goods), provided that they are relatively more productive in one of these goods (i.e. have a comparative advantage) then they should specialize in its production, while withdrawing from production of the other good.

It is seen recently that the World Economic Forum (WEF) in its different reports of assessment of global competitiveness has used twelve pillars for competitiveness divided into mainly three groups. The first group is related to the basic parameters: institutions, infrastructures, macroeconomic stability, health and primary education. The second group represents the sources of efficiency: efficiency of health and primary education, efficiency of the markets and products, efficiency of the labor markets, sophistication of the financial markets, opening to technology and size of the market. The third group concerns the sources of efficiency: sophistication of the enterprises and innovation. However, the majority of these different pillars of competitiveness represent, explicitly or implicitly, the factors of endogenous growth. This is augmented by Romer (1986) while supposing that physical capital is a source of endogenous growth. Therefore, as the accumulation of the physical capital and the production increase, there is a stock of knowledge that is going to be accumulated and that is going to exercise positive externalities on the activities of the other firms. Lucas (1988) also developed an endogenous growth model centered on the human capital, which accumulated by the means of some activities of which the most significant were education, training, health and the innovation. In the similar fashion Romer (1990) and Aghion and Howitt (1992) developed two models of endogenous growth, where the source of growth is in technological innovation. Barro (1990) also proposed a model that clarifies the role of infrastructures in the generation of economic growth by the effects of practice that they exercise on the productivity of the private factors. Although, Long-term economic development is shaped by the value created by both people and businesses, leveraging technology as an accelerator for growth, Economic development is not a one-off initiative but requires continued improvements across the different areas of importance. Locations need to integrate development across a wide range of key stakeholders and continually innovate to

bring in new ideas and sustain competitive advantage (IBM Report, 2013). It is also a fact that no economic success story over the past 30 years has captured the world's imagination more convincingly than the stirring transformation of China and its return as a central pivot of the world's economy. Although considered relatively impoverished, isolated, and cut off from global innovation and technology a mere generation ago, China, with its 1.3 billion population, has dramatically re-emerged to become one of the world's great manufacturing centers, a vibrant commercial marketplace, a vital source of global finance, and a central node in the global economy of the 21st century. But, the growth has started to diminish after 2015, when china was lagged behind in growth rate from India and then one year later, the growth rate plummeted to 6.7% a far away from 2 digit growth rate that china experienced some time ago. Today's china is different than the china that was 30 years ago, the wages have been increased, and the population especially the youngest started to decrease and inflation is gone up. China has lost its competitive and comparative advantage and now it has to find a new one. The fact that wages today are rising more rapidly than productivity dictates that China move smartly up the "value chain" in the near future, from relatively commoditized manufacturing and lower-skilled assembly to more innovative activities. Beyond the application of relatively low-skilled labor, China needs to produce more "value" in a wide assortment of fields ranging from design and logistics to financial and business services to high-tech industries and life sciences. Undoubtedly, China possesses a number of distinct advantages that could allow it to rapidly move up the value chain and push out the nation's technological frontier. Government policies are actively targeting key industries for aggressive investment. Therefore, it could be observed that, the central government is also inducing highly talented China-born scientists and other experts who were trained abroad to return home. The government is investing in universities that can develop a trained workforce of technical workers and is creating "clusters" at which high-tech and bioscience firms can converge. However, since it still actively embraces the role of strong central planning as a means to lead economic development, China could conceivably develop its own distinctive model of innovation and entrepreneurship that

competes against the more independent and diffuse systems that have developed in the West, which are generally powered by imaginative entrepreneurs (Deloitte Report, 2014).

#### **2.4 Economic Transition:**

Edgar (1994) argued that, a transition is the kind of economy that is changing from a centrally planned economy to a market economy. He further elaborated in 1991 that transition economies are going through a set of structural transformations, those intended to develop market-based institutions. The transformations including economic liberalization, where prices are set by market forces rather than by a central planning organization. It was also mentioned that while trade barriers are removed, there is a push to privatize state-owned enterprises and resources, state and collectively run enterprises are restructured as businesses, and a financial sector is created to facilitate macroeconomic stabilization and the movement of private capital (Edgar, 1991). The examples of this process are China, the former Soviet Union and Eastern bloc countries of Europe and some third world countries. However, the transition process is usually characterized by the changing and creating of institutions, particularly private enterprises; changes in the role of the state, thereby, the creation of fundamentally different governmental institutions and the promotion of private-owned enterprises, markets and independent financial institutions (Falke, 2002). It is argued by Ahrens & Mengerlinghaus (2006) that effective economic transition presupposes credible commitments that political promises are actually delivered to citizens and investors. Moreover, it crucially depends on the administrative capacity of state institutions, the relationships between policymaking entities and different strata of society, and the technical and political ability of policymakers to formulate and implement the policies which the political leadership seeks to pursue. In this regard, the governance structure underlying the process of policymaking is of utmost importance. The early contributions in the field of economic transitions was made Lipton and Sachs (1990), when they outlined a transition strategy for Poland, which was used immediately as a reference for other transition countries. In the transition



economic process, there was one approach was most famous than all others and it was the big bang approach to transition and that had a compelling logic for many scholars. Its intellectual roots were threefold, firstly, it informed that shock therapy or 'cold turkey' is the only way to finish hyperinflation, since only drastic reductions in money supply could lead to changes in expectations. Secondly, if there is any single reform introduced on its own would have less positive effects, and possibly negative effects, than if all reforms were introduced at the same time. For example, privatization and liberalization obviously complement each other. The idea of complementarities had been advanced a long time ago in comparative economics and the analysis of economic systems. The disappointing results from partial reforms in the early 1980s in countries such as Hungary strengthened the argument for complementarities. Last but not the least "The 'Washington consensus' on structural reforms in emerging markets in general, that puts a strong emphasis on liberalization, privatization and fiscal discipline as conditions for aid from the international financial institutions. The disappointing experiences with development aid in the 1960s and 1970s had led to the conclusion that sound macroeconomic policies needed to be backed up by microeconomic reforms to encourage the development of markets and a competitive environment. In the context of transition countries, structural reforms such as liberalization and privatization were obviously fundamental ingredients of the transition itself (Berglöf and Roland, 2006). The research on transition since the late 1980s has contributed to important shifts in the way, the scholars look at economic systems. The many surprises of transition contributed to a change of focus in the vision of economics, and have very much reinforced the Institutionalist perspective, emphasizing the importance of the institutional underpinning a successful capitalist economy. It is observed that successful institutions of capitalism are already present in advanced economies, and scholars had tended to take them for granted when thinking of economies in transition or developing economies. The experience of transition shows that policies of liberalization, stabilization and privatization are improbable to deliver successful outcomes unless they are grounded in adequate institutions, thus accounting for at least some of the failures of the Washington

consensus. Therefore, much of this change of focus towards the Institutionalist perspective was already under way with the development of contract theory, political economy, law and economics, regulation theory, corporate finance and other areas in applied economic theory. The experience from transition provided strong empirical support for this shift in focus from markets and price theory to contracting and the legal, social and political environment of contracting (Roland, 2001). Transition has also renewed interest in the difficult topic of the complementarities between the various elements of capitalist system (markets, incentive and governance systems, legal arrangements, social and cultural norms, organization of government) (Roland, 2000). One of the important themes is the problems of transplantation means institutions; those working well in one context may be disappointing or dysfunctional in another. Yet the remarkable institutional transformation in Central and Eastern Europe cannot be understood without taking into account the process of enlargement of the European Union (EU). The explanation for the success of this institutional transplantation is likely to rest on its comprehensiveness (the entire body of law, and the institutions that go with it) and the strong domestic support for the overall objective of the transition process like in the case of Poland to become part of the European Union. Ultimately, the experiences from transition have also shed new light on the extent of complementarity between politics and economics. Political transition is intimately linked to economic transition, yet even if the case of China shows that some economic reforms can be sustained for long periods of time without fundamental political reform (Dandashly, 2012). China and Eastern Europe economic transition process has some similarities but, they have a lot more differences therefore, china didn't compete with Eastern Europe rapid economic development. Today, Chinese economic reform is for more than simply an economic process. Nearly everything about China is changing, and that is why, the channels of influence from economic changes to non-economic impacts are too numerous to be surveyed comprehensively. Therefore, we have chosen two broad processes of economic change stand out as critically important in shaping contemporary Chinese society. The first is China's transition to a market economy according to its own

distinctive transition strategy; the second is China's transformation from a predominantly agrarian economy to an increasingly urbanized, industrializing economy. Interestingly, the pace of change in contemporary China is rapid precisely because China is undergoing both of these dramatic transformations simultaneously (Naughton, 2003).

These two processes could be labeled as market transition and structural transformation. Market transition in China includes elements that are common to all market transitions, most prominently the shift from bureaucratic control of resources to market-determined allocation, and the corresponding shifts in the nature of political and economic power. It is now broadly recognized that China followed a dual-track transition strategy, and grew out of the plan. This was simply in contrast with the east European countries economic transition in which the predominant objective of the most committed reformers of that time was to move as rapidly as feasible to a modern market economy. It could be seen that, models of how developed economy should look like, were readily available, and close at hand. Therefore, reformers of Eastern Europe saw their own economies as potentially similar to those in neighboring Western Europe. They saw the importance of rapid and profound institutional transformation to quickly shed the legacy of communism. They focused on market mechanism to freely determined prices; all corners would have an equal opportunity to compete on a level playing field in all forms of economic activity. The objective was to eliminate as many distortions as possible as quickly as possible: it was observed that these economics were so distorted by government misallocations and misleading signals that it would be impossible for governments to successfully correct individual distortions. It was considered better to smash the whole system and then start again from the bottom. China haven't done so, china just managed to rectify its old system through incremental changes and produce the growth it wanted but, the system today is creating problems (Naughton, 2007). It is argued by Rhee (2015) that economic transition is inevitable in china because China has to create a more inclusive economy that gives greater play to market forces and achieves safer and more sustainable growth for future economic development of the country. This will

involve a delicate balancing act for the Chinese government to implement reforms while maintaining demand and financial stability. When reforms proceed, it will be critical to ensure effective governance of newly liberalized markets and enterprises. This will require, in particular, hardened budget constraints for both state-owned and private firms, and continued strengthening of the financial supervision framework. He further argued that China has to avoid the renewed use of debt-financed investment so as to prevent a resurgence of corporate leveraging. Since the Global Financial Crisis, growth in China has relied heavily on investment and credit, with the biggest buildup of leverage going to state-owned enterprises, the real estate and construction sectors, and weaker corporates. This created growing vulnerabilities which while still manageable cannot continue to accumulate. Similar is argued by two other scholars while mentioning that the export-oriented and investment-driven model implemented in China, which turned the country into the “workshop of the world”, able to manufacture and deliver almost everything, anywhere, at the lowest price, has performed very well for about thirty years, but it has progressively reached its limits and, in particular after the outbreak of the global economic crisis and the implementation of the stimulus package of 2008-2010, it revealed its negative outcomes: inefficient resource allocation, wastage, structural imbalances, asymmetries, development and income gaps, growing non-performing loans and skyrocketing debt, expanding shadow banking, economic bubbles, corruption, widespread pollution. After 2010, the economy has decelerated, returns on investment kept decreasing, the RMB gradually appreciated, the demographic dividend kept fading away, while wages went up eroding the competitive advantage. Additionally, some of the reforms envisaged by the new leadership, targeting improved allocation by liberalizing interest rates, energy and commodities prices, are expected to have a similar short-term outcome. In other words, against the backdrop of a development model that is turning obsolete, the whole economic environment is profoundly and swiftly changing and, in response, Chinese economy requires an entirely different approach to development (Pencea & Balgar, 2016).

## **2.5 Contribution of Market Efficiency for Chinese Economic Transformation:**

Fama (1970) defined market efficiency as a market in which prices always fully reflect available information is called 'efficient' in nature. Three information sets have been considered when discussing efficient markets like first, the historical prices (weak form efficiency), second publicly available information (semi-strong efficiency), and third, private information (strong form efficiency). A market may or may not be efficient with respect to each of these information sets. Efficient market is also defined as the one where the current market price and the fair value resemble as all pertinent information is incorporated immediately. But even within the definition of efficient markets the occurrence of errors according to the valuation of the market price is permitted as long as they are random (Lindner et al, 2010). It is found through experimental studies about market efficiency as it is subdivided into three strands of literature. The first is the dissemination of information from informed to uninformed traders. The second strand involves studies about the aggregation of information among market participants. The third focuses on determining simultaneous equilibrium in asset and information markets. These three strands of literature are strongly linked and, when investigating market efficiency, none of these strands should be omitted (Morone & Nuzzo, 2015). Market definition is as old as the system of capitalism, Adam Smith (1776) in his seminal work "Wealth of Nations"; he mentioned that "The division of labour is limited by the extent of the market." The market is the key to specialization. He further elaborated that firms cannot specialize in particular product lines, or particular stages of production, if they cannot sell a sufficient quantity of their output. It is the growth of the market that facilitates both the emergence of new production methods and the growth of the firms and industries that exploit these methods. The market does not just allocate resources but it also stimulates innovation too. The market is an arena of competition and in a market where entry is easy, monopoly power is eroded by the entry of competitors. It is observed that even in innovative high-technology industries, firms circumvent each other's patents, and patents themselves expire. Eventually, the entry of followers may

stabilize the market as an oligopoly, in which several firms share the market. Actually the term “market” is employed in the literature in different ways. For example, in economics, the market is often described in abstract terms as an intersection of supply and demand. It is the play of competitive forces and it is assumed to generate an equilibrium market price. This raises the question of where the market is actually located and where the people who use the market actually reside. The answers to these questions lead to the concept of the market as a place, serving a particular area in which its participants reside. The participants meet at the market because it is an information hub. Historically, market behavior has always been governed by rules, although they have been more intrusive for some commodities and in some localities than others. These rules relate to pricing, quality control, freedom of entry, and so on. They are enforced by law, by agreement, and by social convention. They provide reassurance to customers and help to maintain the reputation of the capitalist market system. Today, these rules are most apparent in the case of regulated natural monopolies, such as utilities, but in fact they apply to all markets (Casson & Lee, 2011). The market is recognized by actually two elements, the structure of the market and the commodity, it is selling. The structure and commodity are inter-linked and there are mainly four market structures available upto today, namely, perfect competition, monopoly, monopolistic competition and finally oligopoly (SCA, 2005). Pindyck & Rubinfeld (1998) gave a definition of a market as “a market is the collection of buyers and sellers that, through their actual or potential interactions, determine the price of a product or set of products”. This definition allows markets to be specified with respect to the participants and, thus, to consider the influence of the market structure, i.e. the numbers of buyers and sellers interacting, but it neither allows the market to have any characteristics that are determined from “the inside” nor does it leave room for the thought that the type of transactions carried out on the market influences its characteristics in any way (Hurrelmann, 2002). Efficiency on the other hand is the simple but deceptive concept; it just appears to be a quantitative concept but, it can be expressed as the largest output for any given input or more specifically as the largest output/input ratio. Although, It’s most obvious application

is in physical processes, for example, "the ratio of the work done by a machine to the energy supplied to it" (Hayne, 1991). But, its exclusively quantitative aspects disappear as soon as it is realized that this definition is useless unless and until the "work done" is identified and this depends on the kind of work someone values. It is seen that "Efficiency is inescapably an evaluative term meaning the physical facts by themselves can never determine efficiency" (Hayne, 1991). It is more accurately expressed as the value of output/value of input. It is also found that only processes whose inputs and outputs are subject to unambiguous evaluation (aggregation, measurement, etc.) are capable of being unambiguously evaluated according to the criterion of efficiency. The efficiency concept is crucially dependent on the concept of value (Lewin, 1995). Now, we move towards determining the structures of the market, the five structures of the market are described here; the first one is perfect market or perfect competition. Perfect competition is a market structure in which the following five criteria are met, first all firms sell an identical product, second all firms are price takers because they cannot control the market price of their product. Third, all firms have a relatively small market share and fourth, Buyers have complete information about the product being sold and the prices charged by each firm; and finally, the industry is characterized by freedom of entry and exit. Perfect competition is sometimes referred to as "pure competition"(Parkin, 2006). Second is the monopoly, which is the specific type of economic market structure and It exists when a specific person or enterprise is the only supplier of a particular good and as a result, monopolies are characterized by a lack of competition within the market producing a good or service. Monopoly characteristics include profit maximizer, price maker, and high barriers to entry, single seller, and price discrimination. Sources of monopoly power including economies of scale, capital requirements, technological superiority, no substitute goods, control of natural resources, legal barriers and deliberate actions (Pal, 2014). Monopolistic competition is a middle ground between monopoly, on the one hand, and perfect competition (a purely theoretical state), on the other, and combines elements of each. It is a form of competition that characterizes a number of industries that are familiar to consumers in their day-to-day lives. It describes markets

with many firms that sell goods and services that are similar, but slightly different. The model of monopolistic competition describes a common market structure in which firms have many competitors, but each one sells a slightly different product. Many small businesses operate under conditions of monopolistic competition, including independently owned and operated high-street stores and restaurants. In the case of restaurants, each one offers something different and possesses an element of uniqueness, but all are essentially competing for the same customers (Bertoletti & Etro, 2013). Oligopoly describes markets with only a few firms, these companies sell a product or service that may or may not be completely standardized, but is similar enough that they're in competition. Examples of oligopolies are wireless network providers (the U.S. market is dominated by four companies like AT&T, Verizon, T-Mobile, and Sprint), and fast-food burgers (think McDonald's, Burger King, and Wendy's). One of the defining features of an oligopoly is that the success of firms in the market is largely determined by the actions of its major rivals. By definition, this isn't true both for firms in perfectly competitive markets or monopolists. It is observed that in oligopoly industries, competition occurs in ways that are unique to these industries. Two unique aspects of oligopoly competition are introduced here shortly; one is mutual interdependence and other is repeated interaction. Mutual interdependence exists when the actions of one firm has a major impact on the other firms in the industry. For instance, if Coke decides to sell more of its product (and to do so they reduce their prices), Pepsi will certainly notice that its sales fall. Coke's behavior affects Pepsi: mutual interdependence exists within the US soft drink market. It is often seen that the oligopolists within an industry have been competing with one another for a long time. For instance, Pepsi and Coke have competed within the same market for decades. Ford, GM, and Chrysler have faced one another in the US auto market for a very long time. Oligopolists in other markets might have competed with one another for a much shorter period of time, perhaps only a few years. This implies that they know each other strategy, behavior and other aspects for competition (Dixon, 2007). There are different kinds of market like Goods Market, Stock market, real estate market and others and all are governed by the rule of right information and that



information is regulated by the state. Therefore, in finance, the efficient markets hypothesis (EMH) suggests that profiting from predicting price movements is very difficult and unlikely. The main engine behind price changes is the arrival of new information. A market is said to be “efficient” if prices adjust quickly and, on average, without bias, to new information. As a result, the current prices of securities reflect all available information at any given point in time. Consequently, there is no reason to believe that prices are too high or too low. Security prices adjust before an investor has time to trade on and profit from a new a piece of information. The key reason for the existence of an efficient market is the intense competition among investors to profit from any new information. The ability to identify over- and underpriced stocks is very valuable (it would allow investors to buy some stocks for less than their “true” value and sell others for more than they were worth). Consequently, many people spend a significant amount of time and resources in an effort to detect “mis-priced stocks”. The most crucial implication of the EMH can be put in the form of a slogan like “Trust market prices” because at any point in time, prices of securities in efficient markets reflect all known information available to investors. Actually, there is no room for fooling investors, and as a result, all investments in efficient markets are fairly priced, i.e. on average investors get exactly what they pay for. Fair pricing of all securities does not mean that they will all perform similarly, or that even the likelihood of rising or falling in price is the same for all securities. According to capital markets theory, the expected return from a security is primarily a function of its risk. The price of the security reflects the present value of its expected future cash flows, which incorporates many factors such as volatility, liquidity, and risk of bankruptcy (Clarke et al, 2000). The efficient market hypothesis is associated with the idea of a “random walk,” which is a term loosely used in the finance literature to characterize a price series where all subsequent price changes represent random departures from previous prices. The logic of the random walk idea is that if the flow of information is unimpeded and information is immediately reflected in stock prices, then tomorrow’s price change will reflect only tomorrow’s news and will be independent of the price changes today. But news is by definition unpredictable, and,

thus, resulting price changes must be unpredictable and random. As a result, prices fully reflect all known information, and even uninformed investors buying a diversified portfolio at the tableau of prices given by the market will obtain a rate of return as generous as that achieved by the experts (Malkiel, 2003). However, EMH was widely accepted by it was well criticized by a famous economics Hayek through his research on Constitution of Liberty, when he mentioned that the efficient-market hypothesis theoretically represents a misplaced concreteness as the formal model becomes confused with the reality of the market process. The price system's "true function" is to guide entrepreneurial discovery and adjustment. He also pointed out that a free system can adapt itself to almost any set of data, almost any general prohibition or regulation, however, so long as the adjusting mechanism itself is kept functioning. Because, it is mainly changes in prices that bring about the necessary adjustments, this means that, it is necessary for the system to function properly, therefore it is not sufficient that the rules of law under which it operates be general rules, but their content must be such that the market will work tolerably well (Hayek, 1960). Furthermore, Fama's definition that in an efficient market, prices "fully reflect" available information was also criticized by Leroy (1989) as empty and tautological. He argues that it is unclear how the market correctly uses all relevant information in determining security prices, if investors have heterogeneous information (Leroy 1989). In the spirit of information economics approach Grossman (1976), also noticed a paradox in Fama's definition of fully reflect. If prices fully reflect all available information, there is no reason for an investor to search for information in his decision-making of buying and selling different stocks. How could the prices fully reflect the information if no one searched for information, Grossman and Stiglitz (1980) analyzed this paradox and presented the model where the prices partially reflect the information that arbitrageurs possess. Their theory was based on two types of investors, informed and uninformed. If the market is efficient, where information is associated with a cost, the informed individuals would not be able to get any compensation from the uninformed individuals, since the information will be fully reflected in the stock prices. However, they also found certain noise in this model,

which implied that stock prices could not reflect all information. If the market price were perfectly informative, there would be little incentives for investors to search and pay for additional information for their decision-making. (Grossman and Stiglitz 1980; Latham 1986). This work has led the development of a large body of literature attempted to redefine the notion of the efficient markets (Findlay and Williams 2000). It is also observed that the role of market efficiency in determining economic performance is becoming a central issue for both policy-making and academia. Furthermore, it is seen in many countries that there appears to be a shift from government command and control policies towards the promotion of market efficiency through various economic reforms. It is mentioned that general market efficiency relates to extent to which actual market prices reflect the true production costs and benefits received from output. In turn, this would depend upon the speed with which quantity demanded and quantity supplied move towards equilibrium (Formosa, 2008). According to economic theory, market efficiency is conducive to the optimum allocation of resources (Woodford, 2002). In such circumstances, the price mechanism is thought to ensure that the products and services produced will end up in the hands of those that value them most (Levy, 2007). Market efficiency is also thought to be welfare-optimizing (Cordina, 2008). Burgess and Mawson (2003) in addition show that an economy's ability to reallocate resources affects its growth rate. This is also noted that a free market system results in a Pareto-efficiency, this can only occur under very restrictive idealized conditions that are unlikely to be realized in practice. This is most certainly never the case with a centrally planned economy as a result of imperfect information at the economic Centre as well as poor incentives to set optimal levels of pricing and production. However, even under a decentralized economic system, a number of possible distortions where marginal social costs and marginal social benefits are not equated and can result in market failures that affect the efficiency and quality of a free market in the allocation of resources (Mendes, 2007). Government can help through its mechanism to provide market efficiency through the efficient use of resources. Government can intervene in private markets in at least three ways, first by directly providing goods and services, second, by creating

incentives to alter economic decisions through the use of taxes and subsidies, and third, by regulating private economic activity(Pettinger, 2012).

It is seen that governments intervene in markets to address inefficiency because, in an optimally efficient market, resources are perfectly allocated to those that need them and in the amounts they need but, in inefficient markets that is not the case; some may have too much of a resource while others do not have enough. Inefficiency can take many different forms. The government tries to combat these inequities through regulation, taxation, and subsidies and therefore, most governments have any combination of four different objectives when they intervene in the market namely, maximizing social welfare, macro-economic factors, socio-economic factors and other objectives (Stiglitz., 1993). Le Grand, Propper et al. (2008) added that government provides some incentives and fundamental requirements on which the market economies rest, like property rights and contract enforcement. It is like, unless contracts are enforced, people would not go into contracts and unless there is protection for private properties, the people would not have enough incentive to invest because, and it might be kept and deceived. So, without these protections, the market itself cannot function. Finally, in cases where market indicators alone are not potent guides for the required actions, suitable nonmarket institutions are necessary (Chang, 2010).

## **2.6 Contribution of Technological Readiness for Chinese Economic Transformation**

According to Global Competitiveness Report 2008-2009, the technological readiness aims to measure the agility with which an economy adopts existing technologies to enhance the productivity of its industry. The importance and value of technology adoption for national competitiveness has been growing in recent years, as well as progressed in the dissemination of knowledge and the rising use of ICT has become increasingly widespread. Traditionally, growth theory focused on physical and human capital accumulation as the ultimate sources of growth. Today, economists and policymakers alike recognize innovation as a key driver of economic growth and

development (Doe-Bong 2009). Basu and Weil (1998) and Hausman and Rodrik (2003) all argued that developing countries are facing a technology bias and need appropriate existing technologies, and this process of technology adoption is not cost-free but rather as uncertain as the innovation process in the OECD countries (Brach, 2010). In general, the bulk of the literature on economic development in developing countries has concentrated on these countries' access to international technologies through international trade rather than on their innovative and creative capacities (Sachs and Warner 1999; Dollar and Kraay 2004). More recently, there has been found a keen interest in "incremental" or "inside-frontier" innovation and technological capacity are considered as important drivers of development in developing countries and this has been increasing. The need for further theoretical and empirical research in this direction has been underscored and encouraged by leading researchers (e.g. Fagerberg et al. 2009; Freeman and Soete 2009) and research institutions (OECD–UNESCO 2009). Innovation and technology transfer are the key drivers of economic growth in today's world economy. Thus an appropriate economic policy should concentrate on strengthening these processes throughout the country and easing the flow of information and technology between the main players e.g. innovators, companies, state agencies and financial institutions (Brach, 2012). Transition economies are the special case like most of Central and Eastern Europe countries experienced large GDP declines in the 1990's which was resulted from large extent from an overall decline in competitiveness and increasing technology gap in comparison to western countries as today the case of China, its GDP has decreased since 2010. It is also noted that structural changes of the entire economy are almost not possible without an effective technology transfer and well-defined country's innovation system. Therefore, these two factors led the spectacular (despite current problems) improvement in competitiveness and economic success of the newly industrialized Asian Pacific economies (Gurbiel, 2002). Science and Technology policy is one of the core competitive policy formulated by any country especially the developing world in order to move forward in economic prosperity because it depends on number of factors, first, the investment in human

resources training and development; second, the demand for knowledge by the private sector; third, those public policies that provide the appropriate enabling environment for strong knowledge institutions; and fourth, the level and quality of the information and communication technologies systems that permit the flow and dissemination of knowledge and information. When those policies and institutions oriented around these four factors are present in a given country (like in china) and performance is high both within and between them, significant progress can be made in responding to problems associated with stagnant economic growth and future prosperity. But unfortunately, when an appropriate S&T infrastructure, which is composed of these four facets, is not developed, countries fall further behind, rendered stagnant by problems that other more technologically-advanced countries have long since overcome(World bank paper, 2000). It is also observed that science, technology and innovation (STI) serves as a crucial driver of rising prosperity and improved national competitiveness. However, though technological knowledge and skills are cumulative, first mover advantages have created a very uneven global landscape. It is also seen that connecting local technological needs to international technological opportunities is a particular challenge for many developing countries especially the bigger transition economy like China. Therefore, a well-functioning STI ecosystem needs to include, inter alia, political stability and well-functioning institutions, an educated workforce; sound research and education infrastructure and linkages between public and private innovation actors; enterprises committed to research and development; as well as a balanced intellectual property rights (IPRs) framework. Technological change when noted, particularly in developing countries, is not only about innovating at the frontier, but also about adapting existing products and processes to achieve higher levels of productivity as applicable to their local contexts. In this process, the ability of local firms and enterprises to access technological know-how is fundamental to shaping their ability to provide products and services, both of the kind that are essential to improve living standards, and that could also promote growth and competitiveness. This requires investment not only in higher value manufacturing industries but also into sectors that contribute to broader public policy goals (such as health, agriculture,

nutrition and environment) as well as across a range of activities that support overall development, including also marketing, management and financial services. Such investments, over a period of time help to increase absorptive capacity and the ability to adapt and apply existing technologies, thereby leading to a gradual increase in productivity and social welfare (UN Report, 2015).

Moreover, successful innovation and the attainment of “first-mover” advantage requires a diversified and pervasive set of technical infrastructures that support all three stages of technology-based economic activity, like R&D, production, and commercialization/market development. That is why, the number and variety has increased steadily due to the increasing complexity of modern technologies and the associated industry structures. However, without such infrastructures, technological progress in an economic sense would come to a halt (Tasse, 2008). Innovation definition is not simple as it has many types that need to understand before finalizing on which innovation types are necessary to persuade for future economic development. Therefore, Garcia and Calantone (2002) have argued that innovations are mostly classified in taxonomies in order to identify their innovation characteristics and the degree of innovativeness involved. Durand (1992) further added that there are four different perspectives, those can be adopted in order to analyze the intensity and the significance of technical change, first, technological input, the technical novelty or scientific merit; second, competence throughput means new requirements on the competencies (resources, skills and knowledge), transience (Abernathy and Utterback, 1985); Third, the perception of the market: market novelty, new functions proposed to customers; Fourth, Strategic output: impact on the competitive position of the firms. It is observed that most studies on innovation classify innovations in two fields. First on the macro level, the characteristics of innovation that are new to the world, market or sector are considered (Maidique and Zirger, 1984; Lee and Na, 1994). In this situation, the innovativeness is based on factors that are exogenous to the firm, such as the familiarity of an innovation to the world and the industry or the creation of new competitors due to the introduction of new innovations. The second at the micro level, innovation is new to firm or to the consumer (More, 1982). Some

researchers use both yardsticks (Ali et al., 1995; Cooper, 1979; Cooper and de Brentani, 1991). The earlier notion of radical innovation and its different kinds given by Schumpeter (1939) in which, he argued that technical knowledge is acquired both through invention and innovation; economists identified several kinds of innovations within technical change (Mensch, 1979; Priest and Hill, 1980; Archibugi and Santarelli, 1989; Durand, 1992; Dosi, 1988; Clark, 1985; Freeman, 1984). It was also Pavitt (1984) who classified innovation into four sectorial taxonomies according to the firms those generate them, and he intended the taxonomy to describe the behavior of innovating firms, to predict their actions and to suggest a framework for policy analysis. His taxonomy was composed of four main categories. The first one was supplier dominated firms, those active in traditional industries such as clothing and furniture (i.e. firms which innovate by acquiring machinery and equipment). The second one was specialized suppliers of capital goods and equipment those exist in symbiosis with their customers. The third was science-based firms born to exploit new scientific discoveries in fields such as electronics, chemicals, and pharmaceuticals and aerospace, where the main source of knowledge is associated with in-house R&D laboratories and the final one was scale-intensive firms active in mass production industries. China has to focus and develop firms deal in second, third and fourth kinds of innovation (Coccia, 2006). It is well noted that the innovation of product is the output that is beneficial for the client or the customer. It is found that a product innovation is a combination of a new technical development of a product and its introduction in the market (Gort & Klepper, 1982). A new development of a technological product is only an invention until it reaches its introduction in the market, then it becomes an innovation (Gort & Klepper, 1982, Rindova & Petkova, 2007). Although, there are two specific kinds of innovation types radical and incremental. Radical innovation is signified with producing significant and fundamental changes to a product, industry or organization and departs from the antecedent practices, (Gopalakrishnan & Damanpour, 1997). The incremental innovation is more marginal in the way the new practices are implemented,



(Gopalakrishnan & Damanpour, 1997). Incremental products are products that have been modified, (Abdul 1994, Garcia & Calantone, 2002). It is more common for larger already established enterprises or organizations to implement new innovations. The context and structure of an organization influences the adoption and risk-taking of new innovative products depending not only on the size but also on the type of enterprise, leadership, managerial attitudes, distribution of knowledge and organizational structure (Ettlie, Bridges & O'Keefe 1984). It is observed that the indigenous innovation policy in China is presented and it is based on the Medium- and Long-Term National Plan for Science and Technology Development (2006-2020) (Dewar & Dutton, 1986). The areas where China needs to be innovative are Energy, water and mineral resources, environment, agriculture, manufacturing, transportation, IT, population and health, urbanization and development, national defense, public securities (Jakobson, 2007). Innovation is considered to be the key for China to keep up the development towards a high- income society. The focus on innovation in the 12 5-year plan (2011- 2015) is to push the economic development by the help of innovation, but also to move towards increased quality of participating in global research and development networks, (K.P.M.G report on China, 2011). China is considered for a long time to be the biggest manufacturer of the world and therefore, 49 % of their GDP is from manufacturing; therefore it has consequences for industries regarding increasing costs of labor and huge environmental problems, (Feenstra & Wei, 2010). The process by which technological breakthroughs are possible, it is through the increase of the involvement of global community and collaboration of scientists through world class research institutes and universities. The other tool to accomplish innovation is through the domestic enterprises and improved Intellectual property rights (IPR's). The innovation policy of Chinese government is the top-down approach to create innovations through central planning and R&D funding. The funding is channeled to research programs which are administrated by Ministry of Science and Technology (MOST), Chinese Academy of Sciences (CAS), National Natural Science Foundation (NNSF), Ministry of Finance (MOF), Commission on Science, Technology, and Industry for National Defense (COS TIND), National

Development and Reform Commission (NDRC), Chinese Academy of Engineering (CAE) and China Academy of Space Technology CAST. Then the funding reaches universities, research- programs, centers and institutes, (Jakobson, 2007). The Chinese indigenous innovation system is recognized for its state- led strategy to define objectives in order to improve the innovation system (Ernst 2011). While when it is compared to the United States where innovation should be driven by market forces and private sector, then this policy has fundamental differences. The innovation policy is obviously shaped to keep the resources to promote certain areas chosen by the government and managed by the ministries (Svensson, 2015). There are problems of adapting to top down policies that could risk a structural resistance and result in an uneven playing field where more established firms benefit more than new enterprises (Avdeitchikova & Coenen, 2015). The areas those, should be included more aggressively in national innovation policy are mentioned to be the education system, human resources and the protection of intellectual property rights (Huang, et.al, 2004). China has a very high rate of piracy as considered true by the many but recently, there is a huge hue & cry in this regard by domestic enterprises, and the government has started to react. This will surely help to enforce stronger protection laws (Huang, et al, 2004). But, that protection would still would be far away from as compared to developed nations (Morrison 2011). Interestingly, quire recently, The UN section World Intellectual Property Organization (WIPO) report showed that China had filed the most patents in the world last year. But it is found later on that, the increased numbers of patents are not likely to solve the innovation problem in china as, they are more quantitative in nature as, and the policy is focused on producing more regardless of their quality and commercialization prospect. The system actually pushes for mote patents in numbers rather than patents for actual use and good quality, therefor low quality patents are increased and get accepted to complete up the quota (Ekström & Hongli, 2013). However, there is another issue with the increased patents is the paradox off the large upswing of patents compared to the weak protection of IPRs, (Hu & Jefferson, 2008). The result of the upswing is argued to be a combination of china's focus on R&D and FDIs (Foreign direct investments) in China, (Hu &

Jefferson, 2008). It is hard to say that China has become an innovative nation just by paying attention to the increased number of patents and it would be premature conclusion to conclude indeed at this stage. Innovation and development are obviously playing a key role in policies in order to protect the Chinese society from the risks of social turmoil and economic stagnation. The need for innovation on every level of the Chinese society is clearly stated. It is also noted that China has a lot of strengths to develop itself towards a more integrated and innovative society. However there are few obstacles along the path, those need to be addressed to achieve the goal of innovative society and they are: the lack of critical thinking, creativity and the rote learning based education system (Ward, 2004).

## **2.7 Contribution of Higher Education & Training for Chinese Economic Transformation**

Higher education is increasingly being recognized as a critical aspect of the development process, especially with the growing awareness of the role of science, technology and innovation in economic prosperity and transformation (Cerneviciute & Petkute, 2013). The role of higher education as a major driver of economic development is well established, and this role will increase as further changes in technology, globalization, and demographics. In the future, it is possible to remain competitive in light of these changes and therefore, regions need to improve productivity and adopt an innovative spirit. Higher education has the capacity, knowledge, and research necessary to help achieve these goals (Margaret & Kavitha, 2014). The contribution of higher education to economic development can also be measured more usefully with the help of a production function or even a simple regression equation and by using the gross enrolment ratio (GER) and higher educational attainment (HEA) as higher education variables, research has shown that both (GER and HEA) can be expected to have a positive effect on the level of economic development (as measured by GDP per capita). It is found during data from 49 countries of the Asia Pacific region that has been used to demonstrate the significant effect of higher education on the economic growth of nations. This

research has also shown that the larger the stock of the population with higher education (HEA), the higher the prospects for economic growth (Tilak, 2003). Bloom et al. 2005 have confirmed the findings of Tilak (2003) that one possible channel through which higher education can enhance economic development in poor and developing countries is through technological catch-up. It is found that, in knowledge economy, tertiary education can help economies gain ground on more technologically advanced societies as graduates are likely to be more aware of and better able to use new technologies. It is also observed that in a rapidly technologically-changing world, technology makes a significant difference to the economic growth of nations. The United Nations Development Programme's (UNDP) work has shown that the level of achievement in technology critically depends upon the level of higher education in a given economy. Most countries with high enrolment ratios in higher education became 'leaders' in technology, with high levels of achievement in technology. The converse is also true: a large number of countries with low enrolment ratios (say less than 10%) are 'marginalized' in the area of technology. Those with a medium level of enrolment ratios e.g. around 20%, like Singapore and Hong Kong, those have indeed become 'potential leaders' in technology (Pillay, 2011). The role of tertiary education in the construction of knowledge economies is crucial and many developing countries, however, it continues to wrestle with challenges relating to like, expanding education coverage in a sustainable way; inequalities of access and outcomes; educational quality and relevance; and inflexible governance structures and management practices. It is therefore noted that, higher education plays a central role in the social, cultural and economic development of modern societies (Kogan et al, 2012). The role of higher education especially of the universities in socio-economic development is of vital importance and it is elaborated by the four major functions of universities posited by Manuel Castells (2001) as applicable to all societies to a greater or lesser extent provide a suitable starting point for the analysis that follows. First, Castells notes that universities have historically played a major role as ideological apparatuses, expressing the ideological struggles present in all societies. Second, they have always been mechanisms of selection and socialization of dominant elites. Third, the

generation of knowledge, often seen as their most important function, is actually a relatively minor one, with functions of scientific research often assumed by specialized national institutes (in Europe and many developing countries) or within in-house laboratories of private firms (for example, Japan). Fourth, the most traditional - and today the most frequently emphasized function of universities is the training of a skilled labour force. Therefore, it is argued those universities and the societies they are embedded in co-evolve, shaping each other in a variety of ways. This co-evolution is an uncertain process, involving continuous dialogue and interaction. Globalization and the search for sustainability have cast a new spotlight on the role of knowledge institutions in general, and universities in particular. This focus is a product of the view that every society creates the university it needs; and universities in turn help to shape the character of the society in which they are located. As nations become more integrated, so do universities extend their global influence and amplify their impact. The modern world of innovation is thus a complex network of institutions tied together by flows of knowledge (Sagasti, 2004). Universities are key nodes in this global institutional ecology and therefore, it is within this institutional context that universities can deliver on their economic growth goals (Zaglul et al., 2006). It is also noted that scientific discoveries leading to industrial innovations, particularly through academic spin-offs, provide a classic image of universities contributing to economic development, although many research institutions struggle to replicate this and universities may not have the culture or capability to do so. But, yet some universities surround themselves with a local industrial community that can absorb and make use of scientific discoveries to accrue economic benefits (Hatakenaka, 2015). Globalization has its impact in a different way on each and every field of life so as the higher education system in any country around the world. Because of the globalization, countries in the developing world are keen to promote their universities in order to create knowledge unique to the world and beneficial for their status and economic development. It is in the area of knowledge (production of research) where globalization perhaps most affects higher education and exerts considerable pressure in transformational contexts. Global flows

of information and data seem to be an inherent feature of the emerging knowledge economy and draw universities into a range of networks and alliances (King, 2004). States face the realization that they will be left further and further behind unless their leading universities gain entry to at least some of the leading edges of research (Brennan et al, 2004). The World Bank also suggested this in 2008 that by raising the level of education and its quality, countries in developing world may be able to stimulate innovation, promote the diversification of products and services, and maximize returns from capital assets through more efficient allocation and management. It is also mentioned that, in the face of competition from South and East Asia, a more skills-intensive route to development could provide both resource-rich and resource-poor countries with an avenue for raising domestic value added. It has been suggested that higher education can lead to economic growth through private and public channels. The private benefits for individuals are well established and include better employment prospects, higher salaries and a greater ability to save and invest. These benefits may result in better health and improved quality of life, thus setting off a virtuous spiral in which life expectancy improvements enable individuals to work more productively over a longer time, further boosting lifetime earnings (Pillay, 2011). Therefore, it is found that higher education will be a dominant, if not decisive; factor in preparing workers with the robust skills needed to adapt to changing job requirements and thereby impacting their job prospect and career. The transition from manufacturing to the technology-based new economy dramatically raised the skill level needed to get a job. It is found that by 2005, 85 percent of all new jobs in America have required some level of higher education. The requirements for current jobs are changing as well, for example, from 1973 to 2003, the percent of workers age 30 to 59 with some postsecondary education has increased from 28 to 60 percent, and nearly three fourths of the increase in the need for postsecondary education was due to “up skilling” because employer demands for higher skills (Carnevale & Desrochers, 2003). In addition, higher education will be called upon to address the impending shortage of college-trained workers needed to replace the baby boomers; by 2030, nearly 30 percent of the workforce will be at or over the retirement

age (Sampson, 2003). That is why; higher education connects workforce development to the economic development of the region by matching instructional programs to the needs of business. It is also observed that efforts include working with business to identify specific needs, providing work-based learning opportunities for students, offering and supporting apprenticeship programs, and convening and being responsive to advisory committees with representatives from business and industry. Once needs are identified, higher education and industry work together to attract students into critical programs (NIU Outreach Report, 2006). It is argued that investment in education to increase economic growth, as one form of human development strategy, has gained economists' and policy makers' interest (Johnson, 2011). Investment in education preserves returns in the form of skilled labor which leads to increased development and improved quality of life (Yogish, 2006). It is further elaborated that investment in education not only benefits individuals through income but also benefit economy as a whole through skilled labor who increase competition and economic growth (Alam, 2009). The relationship between education and economic growth was first developed by Adam Smith, followed by Marshall, Schultz, Bowman and others (Pradhan, 2009). It was also found through empirical estimation of the relationship dated back to 1957 when Robert Solow estimated the contribution of labor, capital and technological change to economic growth in the United States over the period 1909-1949 (Chaudhary et al., 2009; Matsushita et al., 2006). It is noticed that different theories and models have used to examine the relationship between education and economic growth (Romer, 1990; Chakraborty, 2005). Furthermore, it was found that most of them concentrated on human capital accumulation as a source of acceleration in economic growth. Some of them used human capital as an engine of economic growth to technological change. Individuals and society gained economic benefits because of higher education gained by individuals (Krueger and Lindahl, 2001). Education policy has been undergoing great transformation in China since the initiation of the economic reform and open-door policy in the late 1970s. The market-oriented reforms and pursuit of rapid economic growth in a globalized economy have had important impacts on China's education policy and development.

In line with the development of the market-oriented economy and its increasing integration with the global market, a more pragmatic perception of education has gradually taken shape in the post-Mao era, resulting in the decentralization and marketization of education in China (Ngok, 2007). Nowadays, it is found that in China, scholars have carried out many comparative studies between Chinese universities and American universities, expecting to discover the differences between the systems of higher education in order to enhance Chinese universities. Zhang & Jiang (1994) argue that American universities have attracted the best teachers, developed better management systems, and world-class research facilities (Zhang & Jiang, 1994). Ren (2006) believes that China should adjust the orientation of universities to help the progress of the social and economic development of the nation. Pan (2006) suggests that because of the procedures, structure and function of higher education in America and China are different; the two types of higher education systems have achieved different status. Jiang (2005) argues that the main differences between the two types of higher education systems are in the framework and educational purpose of the university. Viewed from the perspective outside of China, we contend that it is essentially the values of academic freedom that lead to the main differences between these two systems of higher education. It is also found that currently, many Chinese universities are attempting to attract excellent overseas Chinese professors to return to China to teach and do research. They are offering excellent salary and housing, but the main concern of overseas Chinese professors is for the academic freedom to do research and teaching without interference. Because, if there is no or very limited academic freedom in universities, a faculty's desire and ability to carry out research will be restrained. They will have little motivation to do what they are prepared to do, because they know that there will be many limitations. Under such conditions, students too have little freedom to question and debate teachers; instead, they are required to repeat what the teacher believes and they will only do what the teacher wants them to do. Thus the innovation of students is severely limited. It is clear that if a university does not have strong faculty who can do research, and does not have excellent students who can think critically, it will be very difficult



for a university to achieve true excellence (Zhou & Vaccaro, 2006). Higher education & training play a necessary and an increasingly important role in human, social, and economic development (Sutton 1998; Escrigas 2008). The role of higher education institutes (HEIs) in development is vital, but it is also complex, fluid and dynamic because HEIs can exhibit numerous different capabilities and scope, and can affect processes of development both directly and indirectly through teaching, research and service(Thomson, 2008). Higher education institutions (HEIs) are places where knowledge is acquired and transmitted, and successful enterprises rely on them to achieve sustainable development through the transfer of technology, the cultivation of talents and ideas, and the promotion of entrepreneurship. Regional analyses suggest that success depends heavily on institutional “thickness” (Amin and Thrift, 1994; Indergaard, 1997; Cooke and Morgan, 1998, cited in Allison & Keane, 2001) or so called “social capital” (Allison & Keane, 2001). It is also believed that successful economic development relies heavily on a vibrant and progressive system of higher education. According to the World University Rankings (The Times Higher Education Supplement [THES], 2006), the top ranked universities are primarily located in the more developed countries. This is because in the early stages, higher education in those countries adopted the necessary policies to develop itself, thereby assisting economic development in those nations. The higher education systems and economies in those areas have mutually promoted each other, so that the more developed areas have the best higher education systems, and those countries that have better higher education systems have more highly developed economies compared with other nations and regions( Zhou & Vaccaro, 2006). Therefore, it is noted that china’s leaders also understand that its universities are not only instruments of knowledge creation and dissemination, but also instruments of international competition. Therefore, initiatives are under way to foster soft skills in the science, technology, engineering, and mathematics fields to drive industrial innovation and China’s economic globalization. But, despite such efforts, the transition to mass higher education is plagued by a burgeoning of unemployed graduates. The global influence of China’s universities in 2025 will hinge on how it handles a precarious

balance between domestic demands and aspirations to go global. The domestic demands include those by employers for knowledge and skills to upgrade production, by urban, middle-class households for status culture that distinguished their children, and by the rural poor, migrants, and minorities for equitable access and jobs. These demands remain subsidiary to the state's demand for national prosperity, power and strength, stability and unity. The state orchestrates the aspirations of universities to going global by demanding that internationalization does not sacrifice educational sovereignty, even while the state must eventually cede more autonomy to universities (Postiglione, 2015).

## 2.8 Conceptual Framework of the Study:

According to Porter's National Competitive advantage (NCA) theory, NCA is basically an evaluation of how competitively a nation participates in international markets. Porter offers a diamond-shaped diagram to outline the framework of four key factors that can modify four ingredients in the economy in order to become more competitive. The four ingredients are the availability of resources, the information used in deciding which opportunities to pursue for the company or economy, the goals of individuals in companies, and the innovation and investment pressure on companies. The research is based on the general paradigm of porter diamond theory (1990) that shows how economies choose their priority sectors, develop and diversify during the course of their economic journey. This research has taken three efficiency enhancers from global competitiveness index (GCI) in order to find out whether improvement in these three pillars can transform economy of china from an efficiency driven economy into an innovation driven one.

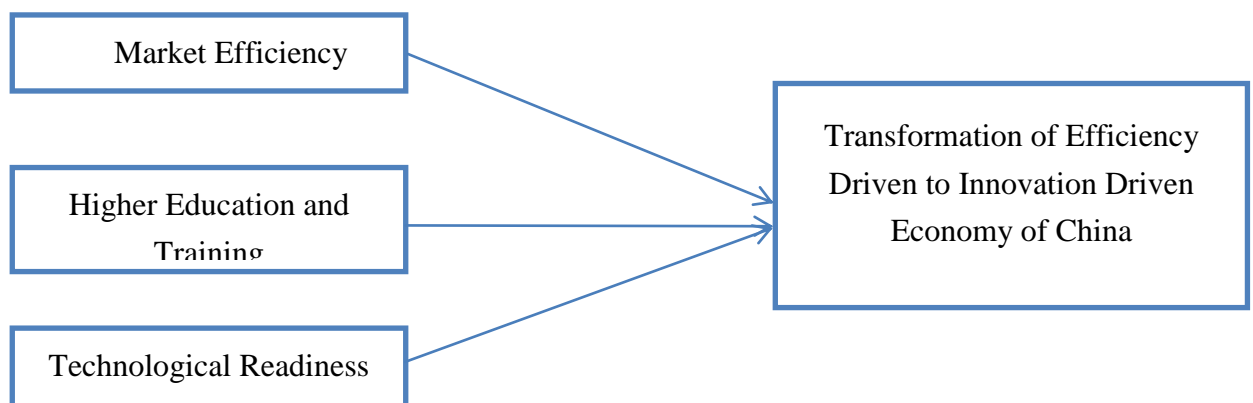


FIGURE 1: CONCEPTUAL FRAMEWORK OF THE STUDY



## Chapter 3

### 3.1 Research Methodology

This chapter would express the research methodology, philosophy and the methods employed to get and then scrutinize the data. It would present the framework that would be placed on which the research is carried out. There is an ample relationship between ontology, epistemology and methodology; therefore the researcher will first examine ontology. Ontology is the science or theory of being. It is connected with the question of how the world is formed: “is there a ‘real’ world ‘out there’ that is independent of our knowledge of it or there is knowledge or the reality build with the social and psychological constructs. There are two types of ontological philosophy are present nowadays realistic and relativistic. Realism is usually defined as the truth is out there and it is ought to be found and even no one even finds it, it would be there and reality is independent. Epistemology then is the theory of knowledge; it reflects the “view of what we could dig out about the world and how we could get knowledge about it.” Again there are two major differences are to be defined here: Firstly, it is feasible to get knowledge about the world unmediated and with no interferences. This implies that objectivity is possible, because everyone observes things in the same way. Secondly, observation is never objective but always “affected by the social constructions of ‘reality’”. Obviously this relates back to ontology (Peutschke, 2003, p2, 3). Lastly, Research methodology is a process to solve the research problem methodologically. Therefore, it could be considered as a science of studying how research is done scientifically. Hence, the researcher learns the different steps that are generally adopted in order to investigate the research problem along with the logic behind them. Hence, It is essential for the researcher to get to know not only the research methods/techniques but also the methodology (Kothari, 2004). Hence, this research will use realistic ontology, objectivist epistemology and quantitative methods to understand the transformation of Chinese economy from an efficiency driven one into an innovative induced economy and its impact on the future economic development of China.

This research follows following methodological steps:

- 3.1.1 Select a Problem
- 3.1.2 Design Research Questions or Hypothesis
- 3.1.3 Collect Descriptive data on the Problem
- 3.1.4 Choose questionnaire to collect data about the problem.
- 3.1.5 Repeat the data collection and revision cycle
- 3.1.6 Data Analyze using SPSS software
- 3.1.6 Finalize the results and conclusion

### **3.2 Research Design:**

Burns and Grove (2003:195) have defined research design as “a plan for carrying out research with maximum control over the external factors those could interfere with the validity of the findings”. Parahoo (1997:142) has also described a research design as “a blueprint that explains how, when and where data are to be collected and analyzed”. Polit et al (2001:167) has that is why narrated research design as “the researcher’s overall strategy for answering the research question or testing the research hypothesis”. Research design could be considered as of the logic or master plan of a research that sheds light on how the research is to be done. It again shows that how all of the main parts of the research study, the samples or groups, measures, treatments or programs, etc., have to work together in an endeavor to address the research questions. It is as same as an architectural outline. The research design could be considered as an actualization of logic in a set of procedures those have to be optimized for the validity of data in a taken research problem. According to Mouton (1996, p. 175) the research design is indicating to a "plan, structure and execute" the research to maximize the "validity of the findings". It means giving directions from the underlying philosophical assumptions to research design, and data collection. Yin (2003) has added further that “collectively a research design is an action plan for getting from here to there, where ‘here’ could be explained as the primary set of questions have to be responded and ‘there’ are some set of (conclusions) answers” (p. 19). The research design of this study is shown in Fig 2 on the next page.

### **3.3 Research Type:**

This research type is quantitative and descriptive in nature considering the fact that the research problem would analyze transformation of Chines economy in terms of three GCI pillars namely market efficiency, technological readiness and higher education and training. The topic is not possible to analyze and properly investigated through qualitative means, that is why quantification becomes the only way out to understand the phenomena at hand. The data gathered through questionnaires will highlight the importance of these three pillars for the transformation of Chinese economy (from an efficiency driven into innovation driven). The data gathered then will used through SPSS to analyze and extract final inference and also to provide some descriptive analysis as well.

### **3.4 Unit of Analysis:**

The word ‘unit of analysis’ could simply be explained as “an entity that has to be analyzed in a scientific research in a particular time frame”. Therefore, it is significant to be acquainted with the unit of analysis of the research as it has an important role to play in any research study. This could not be considered such a serious issue at first since most of the time the appropriate unit of analysis in a study is quite clear. The units of analysis of studies could be divided into some categories or levels (Individual, Group, and Organization). It can be very important to do so, but it; indeed, it will help to see the hierarchical relations between the units of analysis and the possibilities that the researcher can choose for his / her study (Dolma, 2010). *This study has analyzed the problem on the macro-environmental level that is why; the units of analysis for this research are Market efficiency, Higher education & Training and Technological readiness.* These all variables

are used to understand that how Chinese economy could be transformed by making improvements in these three GCI (global competitiveness index) pillars. It is also to evaluate their impact on the future economic development of China.

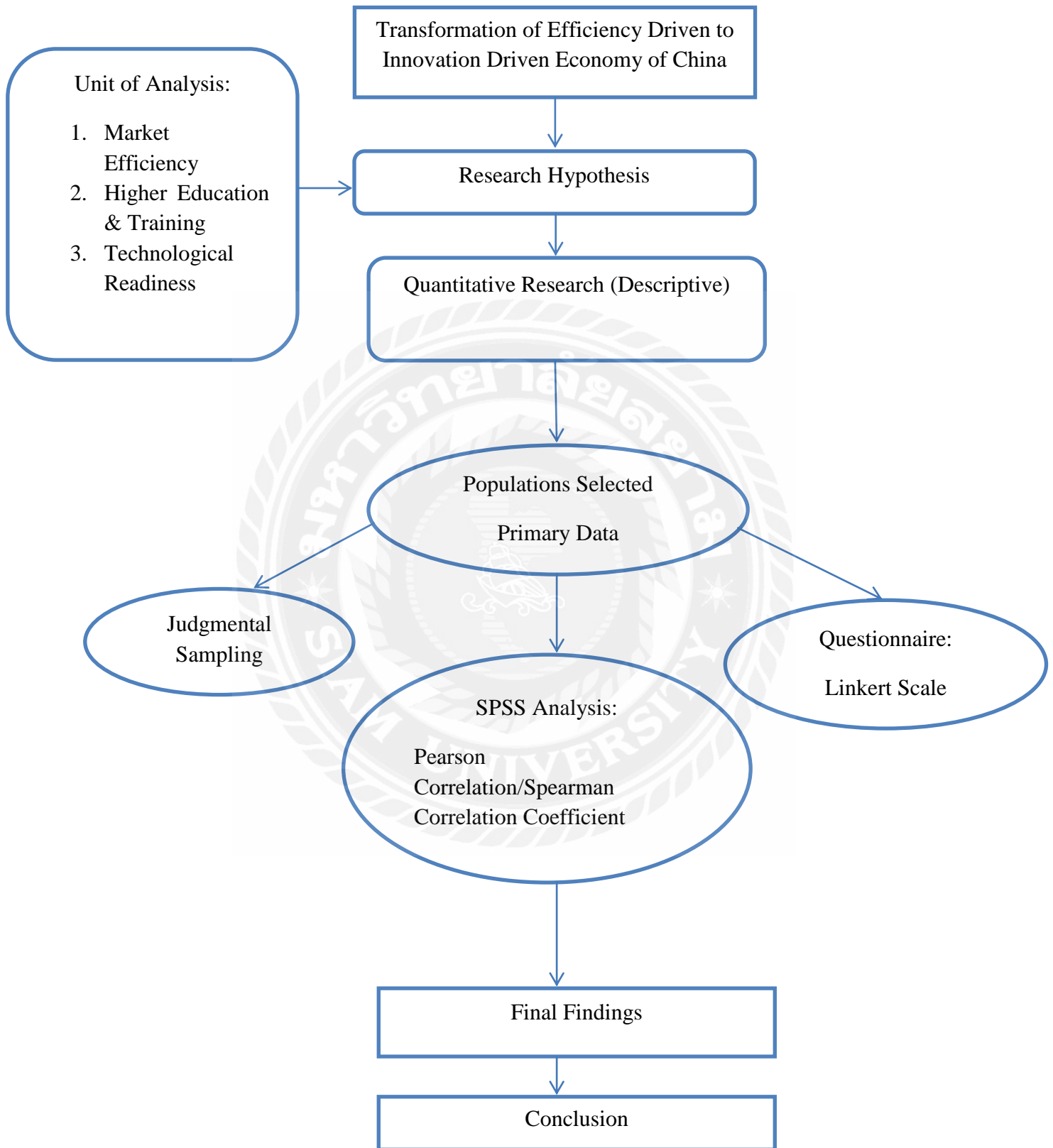


Figure 2: Explaining research design for this study

### **3.5 Data Type:**

The data type used in this research is primary; mainly there are two types of data sets that are used in research field primary and secondary. Primary data is that which is gathered for the first time and is mostly provided in the form of raw materials and original in shape. Hence, this kind of data needs the application of statistical methods for the purpose of analysis and interpretation. While secondary data is the one that has already been gathered by someone and have used through the statistical machines. They are usually modified from the raw material data form, when statistical methods are applied on primary data and then, it is converted to become secondary data. The data type in the research is decided based on the overall philosophy and methodology of the research. As this research is descriptive quantitative in nature, that is why, primary data is the most suited method for data collection of this research.

### **3.6 Data Collection Instrument: Questionnaire**

The data collection tool used in this research is questionnaire because this tool suits the objective of this research considering the fact that questionnaires are easy to analyze. The questionnaire was first made in English and then it was translated into Chinese for better understanding of the subject by the respondents in Chinese universities. The questionnaires were self-administrated in nature. The major advantages of using a questionnaire is data entry and tabulation that can be easily done with many computer software packages like SPSS, Excel and so on. Questionnaires are familiar to most people, nearly everyone has had some experience of completing questionnaires and they generally do not make people apprehensive. The questionnaire is the technique that is mostly used for gathering primary data. But it also based on the nature of the data, that the researcher is looking for, the form could ask questions, make statements, or do the both. If the researcher has chosen to use questions, then he/she may use closed questions, which are questions to which there is only one answer. But if for any reason, he/she has planned for answers to specific questions in a detail way, then that person need somehow to ensure that the answers he/she gets are brief and to the point; otherwise, the subsequent task of analysis is going to be difficult. The questionnaire should be designed to head off such a problem.

When someone is using a questionnaire, all those people in the sample are requested to answer to the same set of questions or statements. Hence, the researcher cannot produce a significant questionnaire in an arbitrary fashion. He/she has to ponder upon very carefully about the exact nature of the data, that individual wishes to collect before start even framing the questions or statements.

#### **3.6.1 Linkert Scale:**

A psychometric response scale has initially used in questionnaires in order to collect participant's preferences or degree of agreement with a statement or set of statements. It is a non-comparative scaling technique and is unidimensional (only measure a single trait) in nature. The participants are asked to provide their agreement with a provided statement by the means of an ordinal scale. Variations: Most commonly seen as a 5-point scale ranging

from “Strongly Disagree” on one end to “Strongly Agree” on the other with “Neither Agree nor Disagree” in the middle; however, some practitioners advocate the use of 7 and 9-point scales which add additional granularity (Bertram, 2007).

### 3.7 Sampling Design:

A sample means selecting units from a defined population. It is seen that, in a survey research, a sample means choosing persons or households from the calculated population in private households. Survey researchers always foresee that the selected persons or households are representative for the population of interest. The objective is to produce a neutral, representative sample of the population in hand, that could be used to infer the behavior/attitudes of the targeted population. Sampling methods in survey research are divided into two categories such as probability or non-probability. A probability method includes random sampling, systematic sampling, and stratified sampling, or the mixture of all these three items. In non-probability sampling, participants are taken from the population in some nonrandom manner. In survey research this is quota or judgmental sampling (Fricker, 2015).

The research is based on following sampling design:

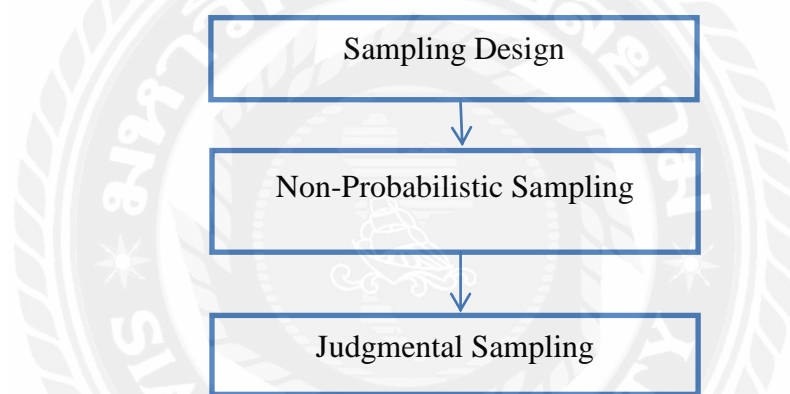


Figure 3: Explaining sampling design for the study

This research has chosen the above sample design as shown in Fig 3 because it seems most suitable and simple. Although, there is a finite population but, the sampling design can't be selected as stratified or cluster or systematic sampling considering the fact that questionnaire designed for this research didn't suit these sampling procedures and then the data collection was also an issue of concern. This research has selected to use non-probabilistic sampling design because of the large population, cost and time constraint.

*Non-probability sampling is a sampling technique where the samples are gathered in a process that does not give all the individuals in the population equal chances of being selected.*

The type of non-probabilistic sampling technique used in this research is Judgmental sampling because it suits the objectives of this research and convenient to use by the novice researcher. It is more commonly known as purposive sampling. In this type of sampling, subjects are chosen to be part of the sample with a specific purpose in mind. With judgmental sampling, the researcher believes that some subjects are fit for the research compared to other individuals. This is the reason why they are purposively chosen



as subjects. This approach is used when a sample is taken based on certain judgments about the overall population.

### **3.7.1 Sample Size:**

The sample size of this research is 292 as the sampling design is judgmental in nature; therefore the researcher has chosen only those respondents that are familiar with the subject at hand. The respondents chosen were the ones those either studying master degree in business/finance/commerce or already completed their postgraduate study. The selected respondents were only chosen from four universities in China, Guangzhou University, Jinan University, Sun Yat Sen University and South China University of Technology due to time concern and financial constraint.

### **3.8 Data Analysis Method:**

Analysis of data is a process of inspecting, cleaning, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making. Data analysis has multiple facets and approaches, encompassing diverse techniques under a variety of names, in different business, science, and social science domains. Qualitative data analysis is non-statistical; its methodological approach is mostly produced by the concrete material at hand. In quantitative research, the main approach to data is statistical and is taking place in the shape of tabulations. That is why; final results are mostly descriptive in nature although conclusive only within the numerical framework. It is an often narrated that quantitative research is “objective” vs. qualitative is “subjective.” However, it is a wide oversimplification. Rather, researcher could compare the two approaches as follows: Quantitative research is providing explanatory laws whereas qualitative research implied to provide more in-depth description.

The SPSS software is chosen as a data analysis method for this research. SPSS is software that gives an opportunity to the researcher to find correlation, descriptive analysis and t-test etc. This is the tool used by the many researchers making their research in quantitative field.

### **3.9 Validity and Reliability of the Research:**

The principles of validity and reliability are fundamental cornerstones of the scientific method. Together, they are at the core of what is accepted as scientific proof, by scientist and philosopher alike. Reliability refers to the consistency of a measure. A questionnaire/ or test is considered reliable if the same result is obtained repeatedly when the questionnaire is re-administered/ or tested repeated. Validity on the other hand encompasses the entire experimental concept and establishes whether the results obtained meet all of the requirements of the scientific research method .That is why, this research has used the instrument that has the reliability result above 70% (as shown in the tables (1&2) below) and is acceptable on minimum standard by all social science research professionals. Validity refers to the extent to which a questionnaire / or test measures what it purports to measure. The instrument is valid that is why, the research is reliable.

### 3.9.1 SPSS Reliability Test:

#### Case Processing Summary

		N	%
Cases	Valid	292	100.0
	Excluded	0	.0
	Total	292	100.0

Table 1: Explaining number of respondents

#### Reliability Statistics

Cronbach's Alpha	N of Items
.753	12

Table 2: Explaining the value of Alpha or the reliability test value

Therefore validity and reliability are connected because if this questionnaire is valid then it implies that the research is reliable and the instrument used will have same results if replicated by any other third party in the future.

## **Chapter 4 : Data Analysis**

This research was the quantitative research and used questionnaire as the data collection tool to get primary data in order to provide descriptive analysis and make final inference. Data analysis basically is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and evaluate data. According to Shamo and Resnik (2003) various analytic procedures “provide a way of drawing inductive inferences from data and distinguishing the signal (the phenomenon of interest) from the noise (statistical fluctuations) present in the data”. Quantitative data analysis is a systematic approach to investigations during which numerical data is collected and/or the researcher transforms what is collected or observed into numerical data. It often describes a situation or event; answering the 'what' and 'how many' questions you may have about something. This is research which involves measuring or counting attributes (i.e. quantities).

**This chapter is divided into two sections:**

- 4.1 Descriptive Statistics question by question (SPSS)
- 4.2 Inferential Analysis by SPSS
- 4.3 Discussion of final results

### **4.1 Descriptive Statistics**

Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data. That is why; this section will try to evaluate how respondents respond to major questions related to independent and dependent variables in the survey.

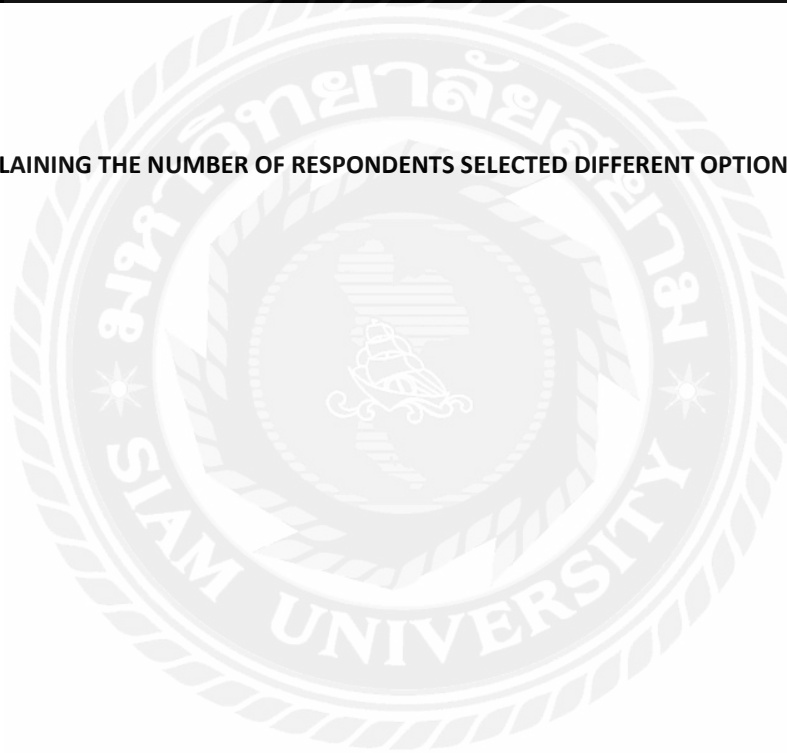
#### **Question 1:**

Do you think that free market mechanism can increase market efficiency in China and thereby, helping china to transform its economy?

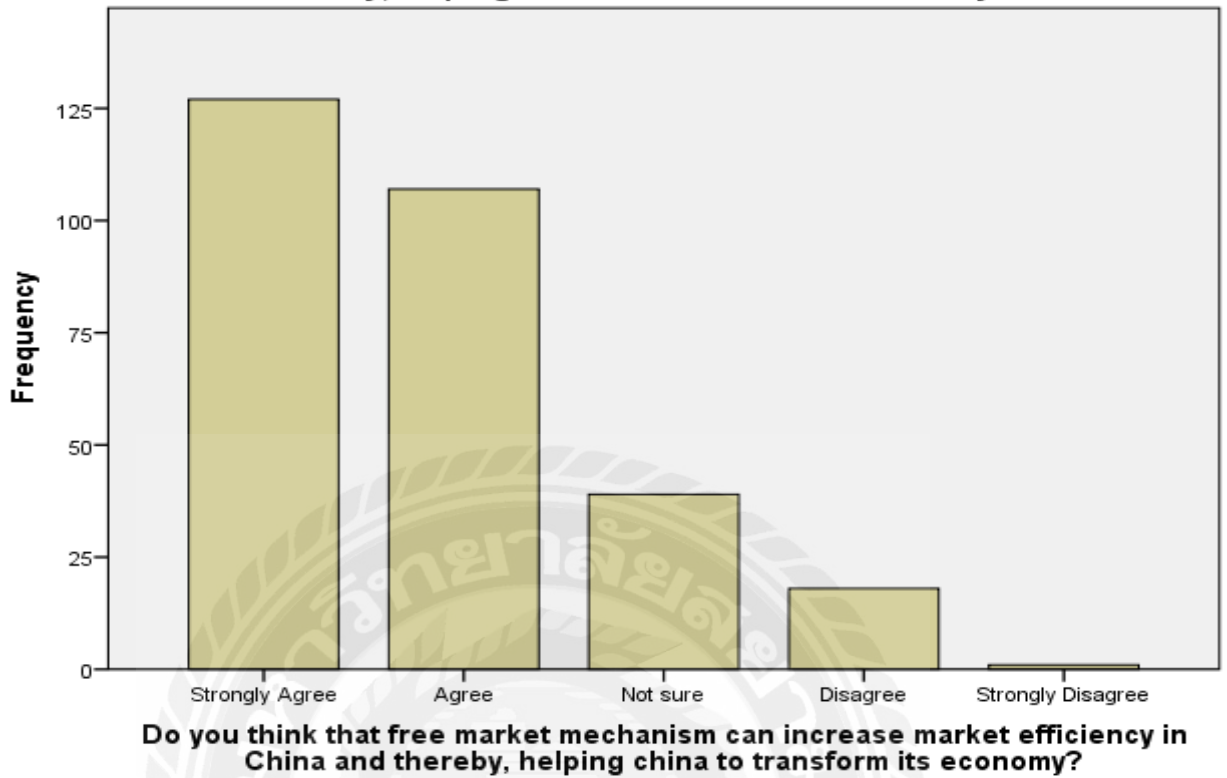
### Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	127	43.5	43.5	43.5
Agree	107	36.6	36.6	80.1
Not sure	39	13.4	13.4	93.5
Disagree	18	6.2	6.2	99.7
Strongly Disagree	1	.3	.3	100.0
Total	292	100.0	100.0	

TABLE 1:- EXPLAINING THE NUMBER OF RESPONDENTS SELECTED DIFFERENT OPTIONS IN QUESTION 1



**Do you think that free market mechanism can increase market efficiency in China and thereby, helping china to transform its economy?**



**FIGURE 1:- EXPLAINING THE NUMBER OF RESPONDENTS SELECTED DIFFERENT OPTIONS IN QUESTION 1**

The above two graphic representations from SPSS show that most of the respondents in the survey selected “agree” and “strongly agree” while asking regarding the role of free market mechanism in improving market efficiency and its impact on the Chinese economic transformation.

**Question 2:**

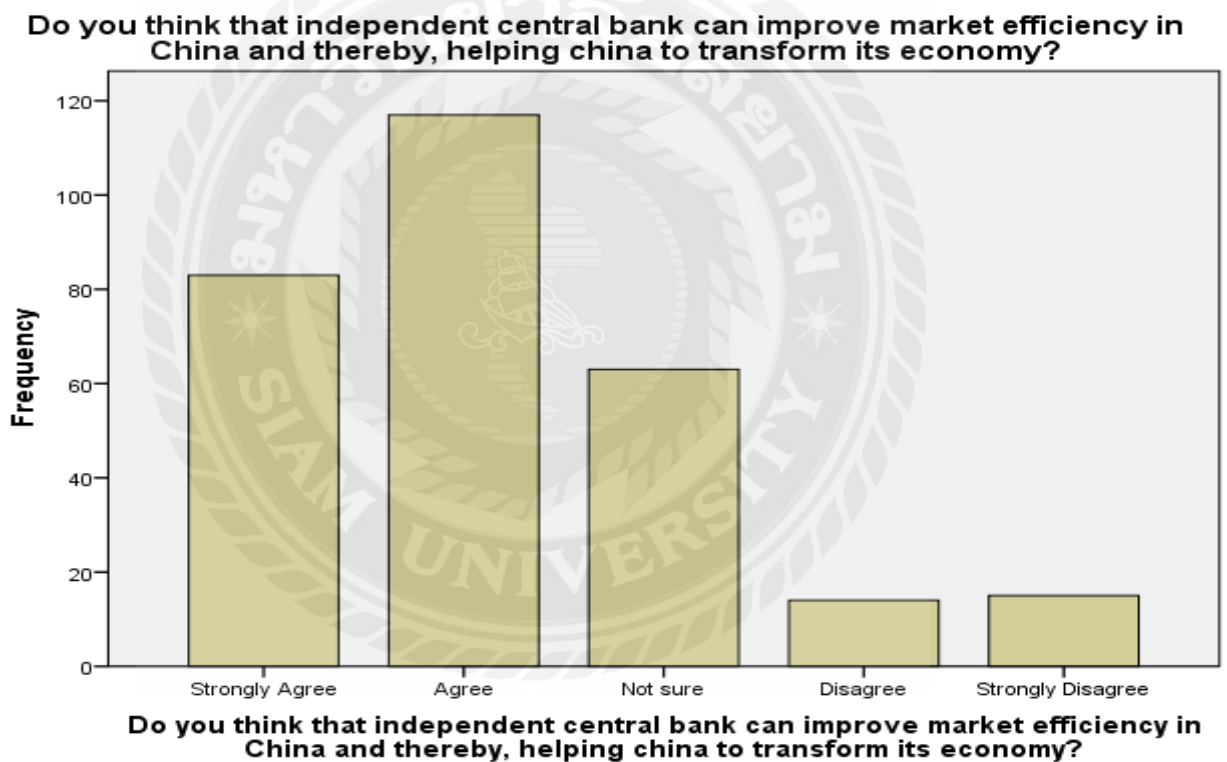
Do you think that independent central bank can improve market efficiency in China and thereby, helping china to transform its economy?

**Frequency Table**

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Strongly Agree	83	28.4	28.4	28.4
	Agree	117	40.1	40.1	68.5
	Not sure	63	21.6	21.6	90.1
	Disagree	14	4.8	4.8	94.9
	Strongly Disagree	15	5.1	5.1	100.0
	Total	292	100.0	100.0	

**TABLE 2:- EXPLAINING THE NUMBER OF RESPONDENTS SELECTED DIFFERENT OPTIONS IN QUESTION 2**



**FIGURE 2: EXPLAINING DIFFERENT PERCENTAGE OF SAMPLE POPULATION SELECTED MULTIPLE OPTIONS FOR QUESTION 2.**

The above two graphic representations from SPSS show that more than 65% of the respondents in the survey selected “agree” and “strongly agree” while asking that

independent central bank can improve market efficiency and thereby having impact on the economic transformation of China

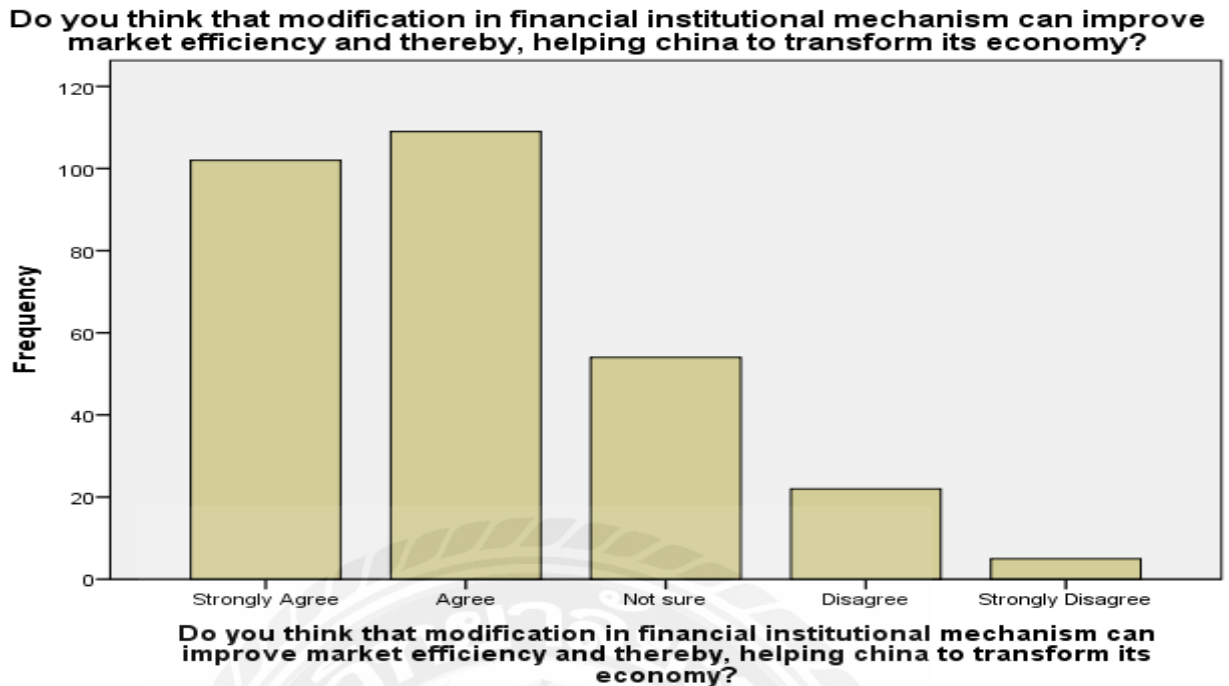
**Question 3:**

Do you think that modification in financial institutional mechanism can improve market efficiency and thereby, helping china to transform its economy?

**Frequency Table**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	102	34.9	34.9	34.9
Agree	109	37.3	37.3	72.3
Not sure	54	18.5	18.5	90.8
Disagree	22	7.5	7.5	98.3
Strongly Disagree	5	1.7	1.7	100.0
Total	292	100.0	100.0	

**TABLE 3: EXPLAINING THE RESPONSE FROM DIFFERENT RESPONDENTS THROUGH RANGE OF OPTIONS IN QUESTION 3.**



**FIGURE 3: EXPLAINING DIFFERENT PERCENTAGES OF MULTIPLE OPTIONS SELECTED BY THE DIFFERENT PERCENTAGE OF SAMPLE POPULATION**

The above two graphical representations presents that in this case also, slightly more than 70% of the respondents agreed in one way or the other that improvement in financial institutional mechanism can improve market efficiency and thereby, having impact on the overall economic transformation of China

**Question 4:**

Do you think that focusing on experiential teaching pedagogy can increase innovation in china and thereby, helping china to transform its economy?

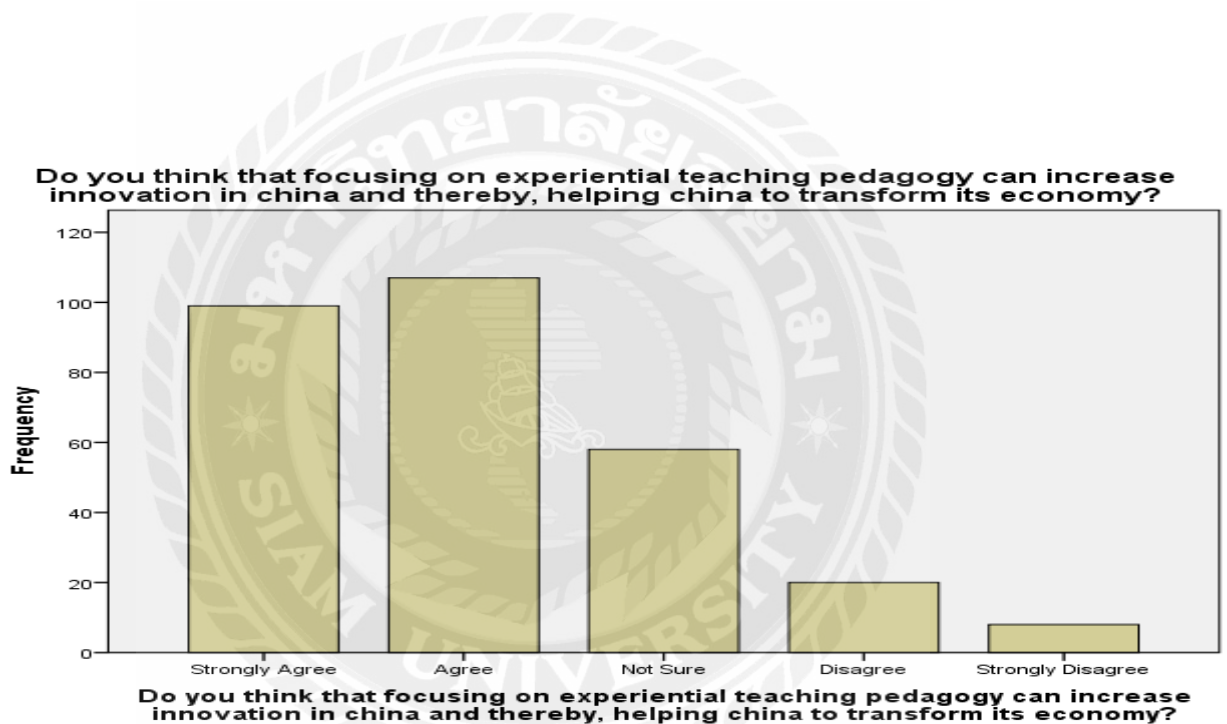
**Frequency Table**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	99	33.9	33.9	33.9



Agree	107	36.6	36.6	70.5
Not Sure	58	19.9	19.9	90.4
Disagree	20	6.8	6.8	97.3
Strongly Disagree	8	2.7	2.7	100.0
Total	292	100.0	100.0	

**TABLE 4: EXPLAINING THE RESPONSE FROM DIFFERENT RESPONDENTS THROUGH RANGE OF OPTIONS IN QUESTION 4.**



**FIGURE 4: EXPLAINING DIFFERENT PERCENTAGES OF MULTIPLE OPTIONS SELECTED BY THE DIFFERENT PERCENTAGE OF SAMPLE POPULATION**

The above two graphical representations presents that in this case, 70% of the respondents agreed in one way or the other that experiential teaching pedagogy can stimulate innovation in china and thereby helping china to transform its economy. However, 20% of the respondents were not sure and 10% disagreed with the idea.

**Question 5:**

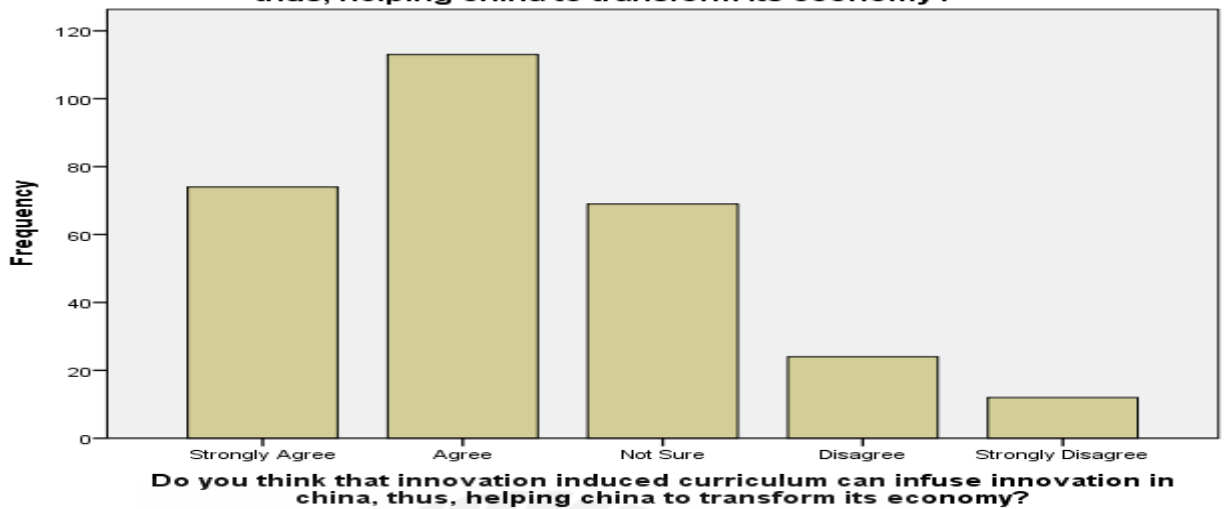
Do you think that innovation induced curriculum can infuse innovation in china, thus, helping china to transform its economy?

**Frequency Table**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	74	25.3	25.3	25.3
Agree	113	38.7	38.7	64.0
Not Sure	69	23.6	23.6	87.7
Disagree	24	8.2	8.2	95.9
Strongly Disagree	12	4.1	4.1	100.0
Total	292	100.0	100.0	

**TABLE 5: EXPLAINING THE RESPONSE FROM DIFFERENT RESPONDENTS THROUGH RANGE OF OPTIONS IN QUESTION 5.**

**Do you think that innovation induced curriculum can infuse innovation in china, thus, helping china to transform its economy?**



**FIGURE 5: EXPLAINING DIFFERENT PERCENTAGES OF MULTIPLE OPTIONS SELECTED BY THE DIFFERENT PERCENTAGE OF SAMPLE POPULATION**

The above two graphical representations described that only 64% of the respondents agreed in one way or the other that innovation induced curriculum can enhance the innovation culture in china and thereby helping china to transform its economy. However, 23% were not sure and remaining was just disagreed with the concept.

**Question 6:**

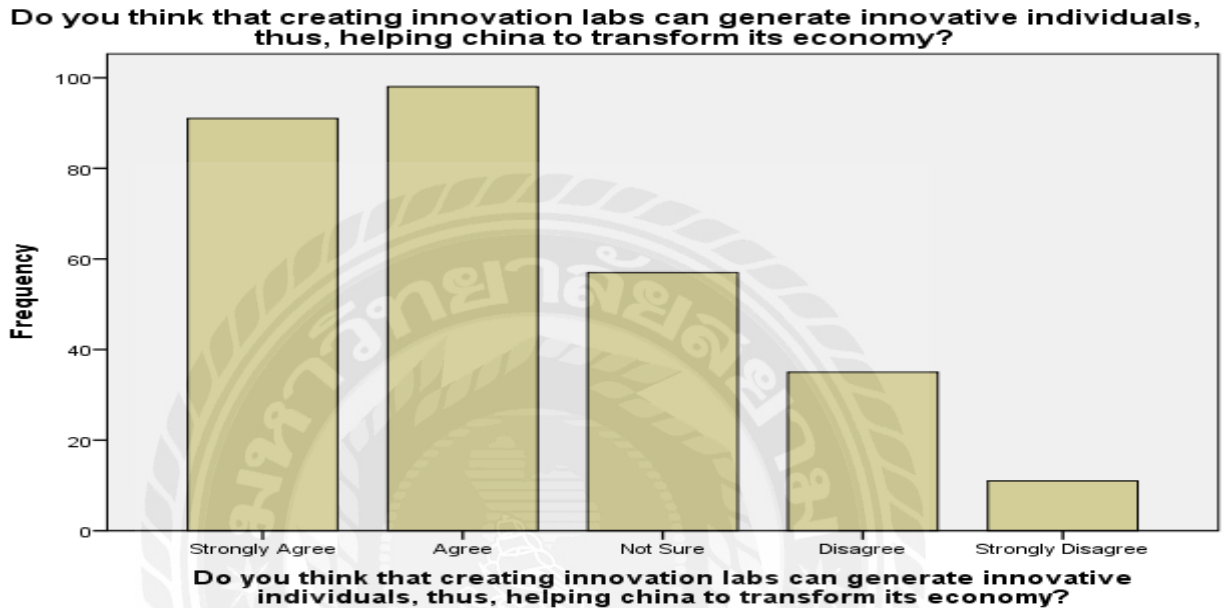
Do you think that creating innovation labs can generate innovative individuals, thus, helping china to transform its economy?

**Frequency Table**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	91	31.2	31.2	31.2
Agree	98	33.6	33.6	64.7
Not Sure	57	19.5	19.5	84.2
Disagree	35	12.0	12.0	96.2
Strongly Disagree	11	3.8	3.8	100.0

Total	292	100.0	100.0	
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**TABLE 6: EXPLAINING THE RESPONSE FROM DIFFERENT RESPONDENTS THROUGH RANGE OF OPTIONS IN QUESTION 6**



**FIGURE 6: EXPLAINING DIFFERENT PERCENTAGES OF MULTIPLE OPTIONS SELECTED BY THE DIFFERENT PERCENTAGE OF SAMPLE POPULATION**

The above two graphical representations show that 64% respondents either agreed or strongly agreed on the idea of creating innovation labs and thereby increasing the number of innovative individuals helping china to transform its economy through innovative ideas. However, 20% were not sure and remaining was not just disagreed with the notion.

**Question 7:**

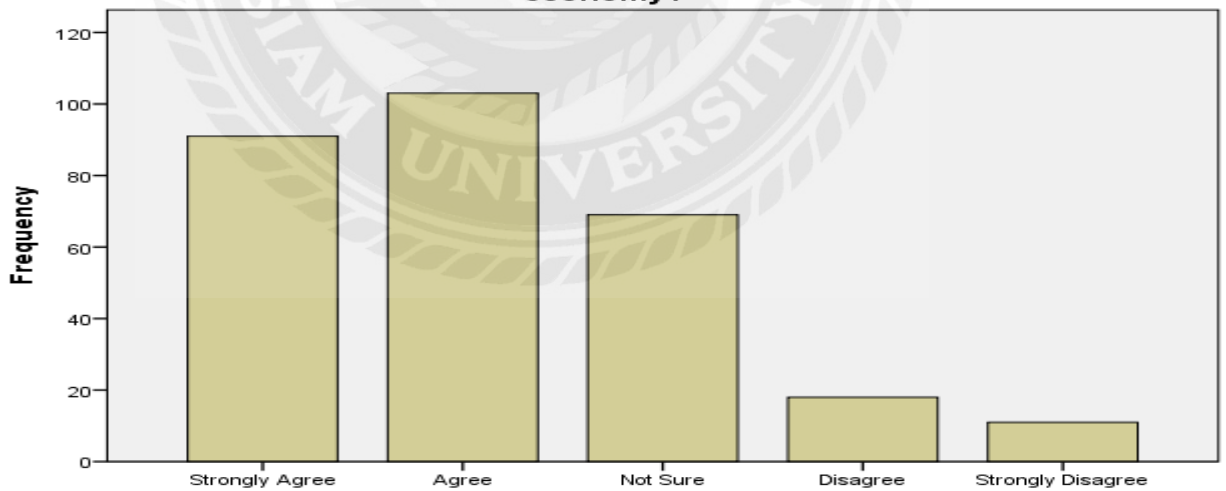
Do you think that opportunity to access internet freely can increase the knowledge of technology in china and thereby, helping china to transform its economy?

**Frequency Table**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	91	31.2	31.2	31.2
Agree	103	35.3	35.3	66.4
Not Sure	69	23.6	23.6	90.1
Disagree	18	6.2	6.2	96.2
Strongly Disagree	11	3.8	3.8	100.0
Total	292	100.0	100.0	

**TABLE 7: EXPLAINING THE RESPONSE FROM DIFFERENT RESPONDENTS THROUGH RANGE OF OPTIONS IN QUESTION 7**

**Do you think that opportunity to access internet freely can increase the knowledge of technology in china and thereby, helping china to transform its economy?**



**Do you think that opportunity to access internet freely can increase the knowledge of technology in china and thereby, helping china to transform its economy?**

**FIGURE 7: EXPLAINING DIFFERENT PERCENTAGES OF MULTIPLE OPTIONS SELECTED BY THE DIFFERENT PERCENTAGE OF SAMPLE POPULATION**

The above two graphical representations depicts that 66% of the respondents were agreed that opportunity to access internet can increase knowledge of technology in china and thereby helping china to transform its economy. However, more than 20% were not sure and 10% disagreed with the basic idea.

**Question 8:**

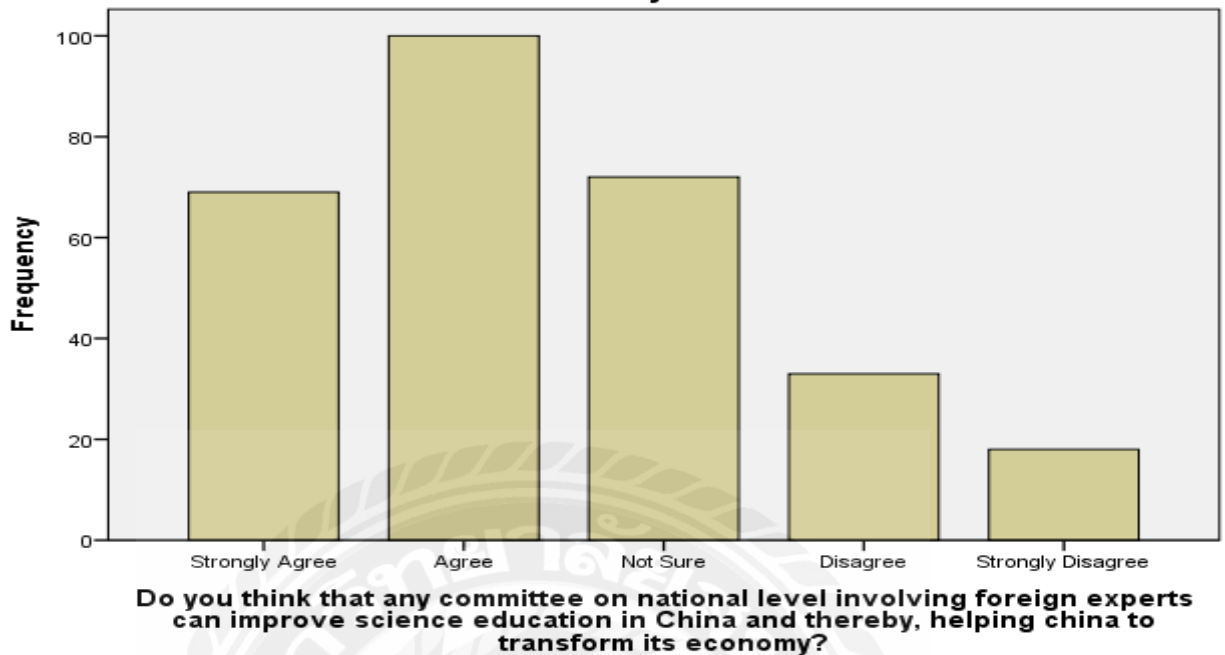
Do you think that any committee on national level involving foreign experts can improve science education in China and thereby, helping china to transform its economy?

**Frequency Table**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	69	23.6	23.6	23.6
Agree	100	34.2	34.2	57.9
Not Sure	72	24.7	24.7	82.5
Disagree	33	11.3	11.3	93.8
Strongly Disagree	18	6.2	6.2	100.0
Total	292	100.0	100.0	

**TABLE 8: EXPLAINING THE RESPONSE FROM DIFFERENT RESPONDENTS THROUGH RANGE OF OPTIONS IN QUESTION 8**

**Do you think that any committee on national level involving foreign experts can improve science education in China and thereby, helping china to transform its economy?**



**FIGURE 8: EXPLAINING DIFFERENT PERCENTAGES OF MULTIPLE OPTIONS SELECTED BY THE DIFFERENT PERCENTAGE OF SAMPLE POPULATION**

The above graphical representations shows the least agreement than the previous questions, only 57% agreed that formation of national committee with foreign experts on science education can improve competitiveness in china and thereby, helping china to transform its economy. However 24% also were not sure and 17% disagreed with the tenet.

**Question 9:**

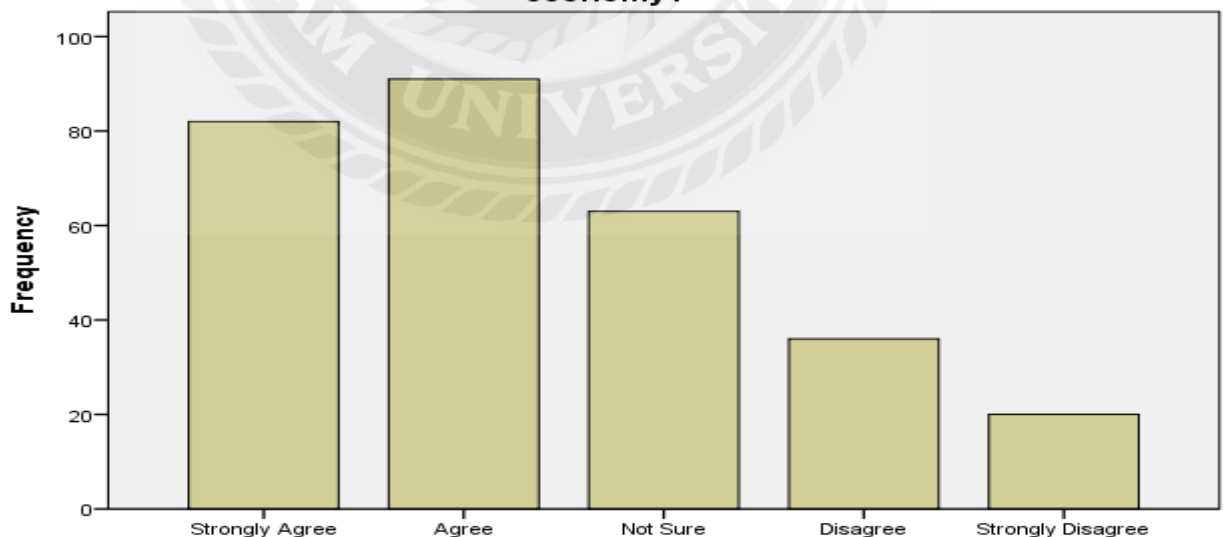
Do you think that improving science labs and other scientific infrastructure can improve knowledge of technology and thereby, helping china to transform its economy?

### Frequency Table

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	82	28.1	28.1	28.1
Agree	91	31.2	31.2	59.2
Not Sure	63	21.6	21.6	80.8
Disagree	36	12.3	12.3	93.2
Strongly Disagree	20	6.8	6.8	100.0
Total	292	100.0	100.0	

**TABLE 9: EXPLAINING THE RESPONSE FROM DIFFERENT RESPONDENTS THROUGH RANGE OF OPTIONS IN QUESTION 9**

**Do you think that improving science labs and other scientific infrastructure can improve knowledge of technology and thereby, helping china to transform its economy?**



**Do you think that improving science labs and other scientific infrastructure can improve knowledge of technology and thereby, helping china to transform its economy?**



**FIGURE 9: EXPLAINING DIFFERENT PERCENTAGES OF MULTIPLE OPTIONS SELECTED BY THE DIFFERENT PERCENTAGE OF SAMPLE POPULATION**

The above graphical representations shows that 59% of the respondents were agreed with the idea that improving science labs and other science infrastructure can improve knowledge of technology and hence, helping china to transform its economy. However, 21% were not sure and 19% were disagreed with the notion.

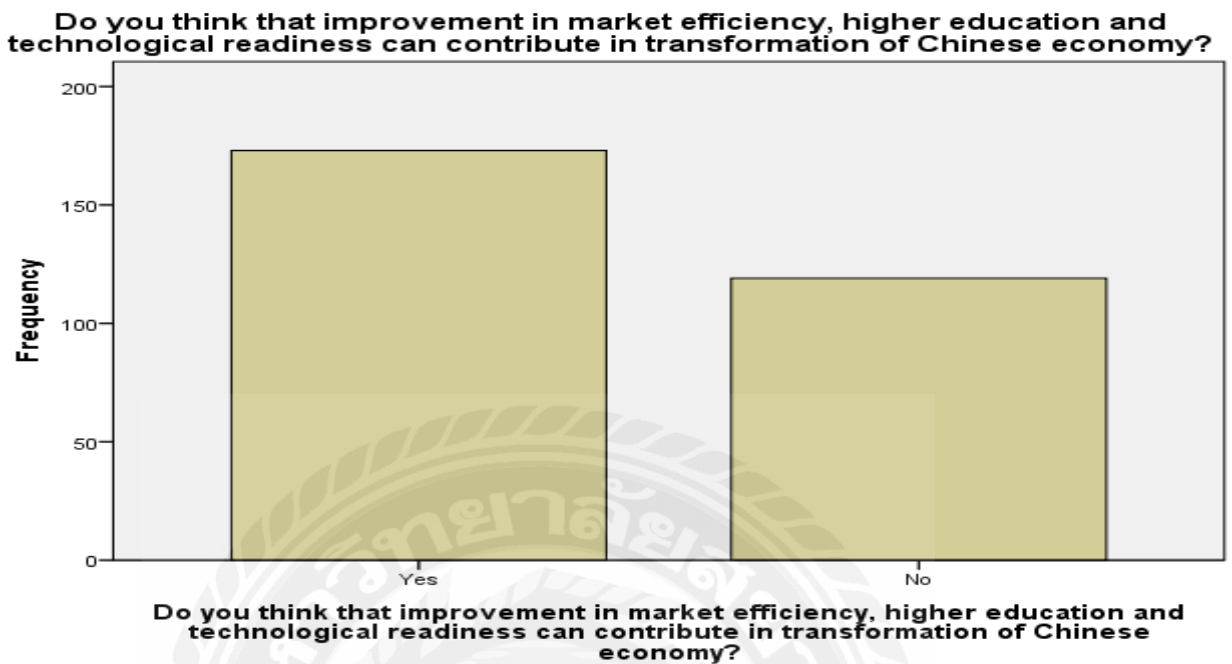
**Question 10:**

Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?

**Frequency Table**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	173	59.2	59.2	59.2
No	119	40.8	40.8	100.0
Total	292	100.0	100.0	

**TABLE 10: EXPLAINING THE RESPONSE FROM DIFFERENT RESPONDENTS THROUGH RANGE OF OPTIONS IN QUESTION 10**



**FIGURE 10: EXPLAINING DIFFERENT PERCENTAGES OF MULTIPLE OPTIONS SELECTED BY THE DIFFERENT PERCENTAGE OF SAMPLE POPULATION**

The above graphical representations show that the final and last question of this survey depicting the overall thinking pattern of the respondents through this dependent variable question. It was found that 59% were agreed that market efficiency, higher education & training and technological readiness as a whole can contribute in economic transformation of china. However, almost 40% were not agreed with the idea.

#### **4.2 Inferential Analysis:**

In contrast to descriptive statistics, inferential statistical analysis involves using information from a sample to make inferences, or estimates, about the population. Inferential analysis can help determine strength of relationship within your sample. In

other words, the researcher can assess the strength of the impact of the independent variables on the outcomes (dependent variable)

#### 4.2.1 Hypothesis 1

H1= whether there is a relationship between market efficiency and transformation of Chinese economy?

#### Pearson Correlation

	Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?	Relationship 1
Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?	1 Pearson Correlation Sig. (2-tailed) N	.290** .002 292
Relationship 1	Pearson Correlation Sig. (2-tailed) N	.290** .002 292

\*\* . Correlation is significant at the 0.01 level (2-tailed).

*Table 1: Presenting Relationship between market efficiency and transformation of Chinese economy by using Pearson Correlation test*

### Spearman Correlation

	Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?	Relationship 1
Spearman's rho	1.000	.275**
Relationship 1	.275**	1.000
Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?	Sig. (2-tailed)	.003
N	292	292
Correlation Coefficient	.275**	1.000
Sig. (2-tailed)	.003	.
N	292	292

\*\* . Correlation is significant at the 0.01 level (2-tailed).

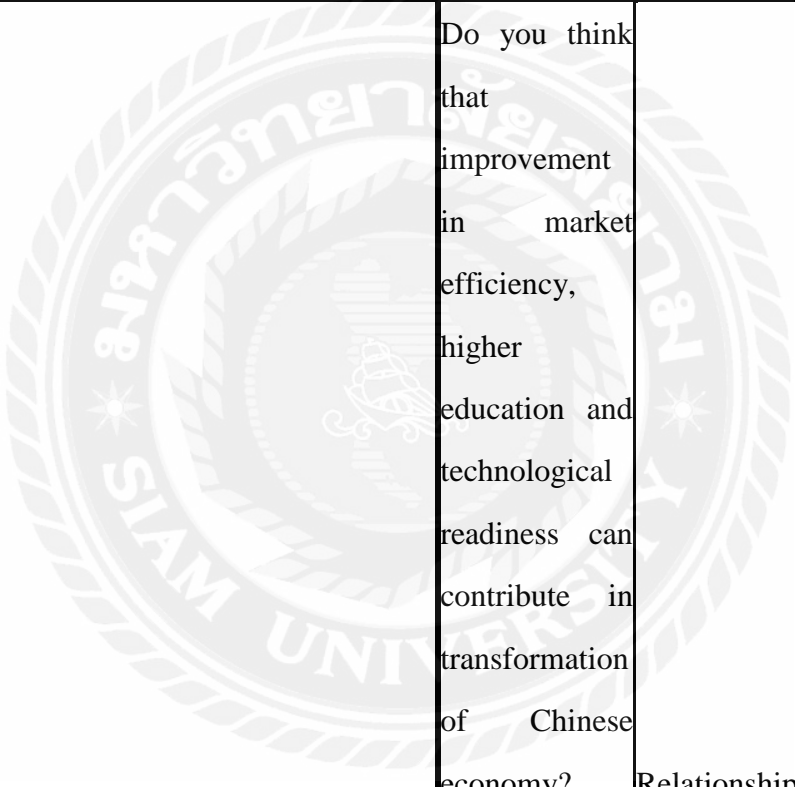
*Table 2: Presenting Relationship between market efficiency and transformation of Chinese economy by using Spearman Correlation test*

The above two correlation tests conclude that there is a weak kind of relationship between market efficiency and transformation of Chinese economy as shown in the tables 1&2.

**4.2.2 Hypothesis 2:**

H2= whether there is a relationship between quality of higher education and training and Chinese economic transformation?

**Pearson Correlation**

	Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?	Relationship 2
Do you think that Pearson improvement in marketCorrelation efficiency, higher Sig. education and(2-tailed)	1	.552**  .001

technological readiness can contribute in transformation of Chinese economy?		292	292
Relationship 2	Pearson Correlation	.552	1
	Sig. (2-tailed)	.001	
	N	292	292

\*\* . Correlation is significant at the 0.01 level (2-tailed).

*Table 3: Presenting Relationship between higher education and training and Chinese economic transformation by using Pearson Correlation test*

### **Spearman Correlation**

	Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?	Relationship 2
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Spearman's rho	Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?	1.000	.490**
			.002
	N	292	292
Relationship 2	Correlation	.490**	1.000
	Coefficient		
	Sig. (2-tailed)	.002	.
	N	292	292

\*\* . Correlation is significant at the 0.01 level (2-tailed).

*Table 4: Presenting Relationship between higher education and training and Chinese economic transformation by using spearman Correlation test*

The two tests above manifest that there is a moderate relationship between higher education & training and Chinese economic transformation as shown in the Table 3&4 above.

#### **4.2.3 Hypothesis 3:**

H3= whether there is a relationship between technological readiness and transformation of Chinese economy?

#### **Pearson Correlation**

	Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?		Relationship 3
Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?	Pearson Correlation 1 Sig. (2-tailed) N	.325** .004 292	Relationship 3 292
Relationship 3	Pearson Correlation Sig. (2-tailed) N	.325** .004 292	1 292

\*\* . Correlation is significant at the 0.01 level (2-tailed).

*Table 5: Presenting Relationship between technological readiness and Chinese economic transformation by using Pearson Correlation test*

### **Spearman Correlation**



	Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?		Relationship 3
Spearman's rho	Do you think that improvement in market efficiency, higher education and technological readiness can contribute in transformation of Chinese economy?	1.000	.301
	Correlation Coefficient	.	.003
	Sig. (2-tailed)		
	N	292	292
Relationship 3	Correlation Coefficient	.301	1.000
	Sig. (2-tailed)	.003	.
	N	292	292

*Table 6: Presenting Relationship between Technological readiness and Chinese economic transformation by using Spearman Correlation Test*

The above two test Pearson and spearman are used to test the hypothesis between technological readiness and economic transformation in china. The tests found to have the weak relationship between technological readiness and Chinese economic transformation as shown in Table 5&6.

### **4.3 Results & Discussion:**

This research was carried out in order to understand how china can transform its economy from an efficiency driven economy into an innovative driven economy by improving three pillars of GCI namely market efficiency, higher education and training and technological readiness. China's estimated GDP for the year 2017 is 6.5 that almost 40% lower than 10.4% in 2010. This is the indication that, growth is declining and the declining quite rapidly. This is because, Chinese industries based on cheap price no longer serve the economy well as there are other locations offering the same incentive and the wage has been on the increase as well. The idea behind this research was taken from the porter diamond theory and national competitiveness theory(NCA) produced in 1990 in which he mentioned that nation becomes competitive when they are good at producing the required commodities with cheap price and good quality and thereby competing in international arena. The porter in his book called "competitive advantage of nations" in 1990 mentioned that factor conditions are general sets of factors those make a nation competitive. Those factors can be anything ranging from human resources and material resources to infrastructure and the quality of research at universities. Although a nation may have an abundance of factor conditions (i.e. low-cost labor and lush vegetation), the usage of these factors is more important than their mere existence. Demand conditions describe the home demand of a product or service belonging to a specific company. Home demand is determined by a number of factors, which include customer needs and wants and a company's capacity and growth rate, as well as the tools used to share domestic preferences with foreign markets. A nation will have more NCA when its internationally competitive supplying industries are prosperous and lead to the prosperity of its related and supporting industries (Porter, 1990). The research is

quantitative in nature and used positivist philosophy with the deductive approach. The research has taken data in the form of survey from 292 participants from four Chinese universities. When it was asked regarding the free market mechanism and its impact on market efficiency and thereby economic transformation, 77% participants were agreed that free market mechanism has the role to play in market efficiency and thereby China's economic transformation. When it was asked regarding the independent central bank role in market efficiency, 65% respondents were agreed that independent central bank has the role to play in market efficiency and thereby, Chinese economic transformation. When it was asked regarding the experiential teaching pedagogy and its role in innovation improvement and thereby Chinese economic transformation, 70% respondents were agreed with the idea. Furthermore, it was inquired about the creating innovation labs and its impact on overall innovation scenario and thereby, Chinese economic transformation, 64% participants nodded their heads in agreement with the tenet. Moreover, when it was inquired regarding the free access to internet and its impact on innovation and thereby, Chinese economic transformation, 66% were agreed with the notion. Finally, when it was questioned regarding forming the national committee with international experts to improve science education, the least only 57% were agreed with the idea of that kind. In the last question regarding the combined impact of all three pillars market efficiency, higher education & training and technological readiness on Chinese economic transformation, almost 60% were agreed with the idea. When the research tries to find the relationship between each of its independent and dependent variables, it was found that, there is a weak relationship between market efficiency and economic transformation, albeit the relationship is significant in nature. It was elaborated that, there is a moderate kind of connection between higher education & training and Chinese economic transformation. Finally, it was extracted from the two Pearson and Spearman correlation tests; there is a weak relationship between technological readiness and Chinese economic transformation.

## **Chapter 5 : Conclusion**

### **5.0 Conclusion**

This research was based on the idea that Chinese economy has been slowed down since 2010 and it needs transformation and moving towards the next economic development stage is the only option. The Global competitiveness index based on the idea of Porter (1990) who identified four stages of economic development in a nation's evolution namely, factor-driven development, investment-driven or efficiency driven development, innovation driven and wealth-driven development. In the case of china, the old investment-led and export-oriented development model in china has covered both the factor-driven and the investment-driven development stages. Edgar (1991) argued that that transition economies should go through a set of structural transformations, those intended to develop market-based institutions and also, the transformations including economic liberalization, where prices are set by market forces rather than by a central planning organization. Now, if china wants to move up in the economic ladder, it needs to make structural changes in order to maintain its pace and increase its GDP growth rate. This research has chosen that is why, the three efficiency enhancers namely Market efficiency, Higher education & Training, Technological readiness in order to find their relationship with the economic transformation of china. There were 12 questions asked to the 292 master degree students in order to find their opinion on the subject at hand and their understanding regarding the transformation of china. When asked about the free market mechanism being supportive for market efficiency, 225 out of 292 participants agreed with the idea, when asked regarding the independent central bank being the market efficiency improver in china, 200 out of 292 participants agreed with the point. When asked regarding the experiential teaching pedagogy impact on innovation in china, more than 200 participants agreed with the concept. When asked regarding the innovation induced curriculum and its role for the economic transformation of china, almost 200 participants nodded their heads in agreement. When asked regarding the access to

internet freely without any censorship being imposed can increase the knowledge of technology and thereby impacting on the economic transformation, 190 participants agreed with the notion. When asked regarding improving science labs and science infrastructure being helpful in technology dissemination and improvement in economic gains, 170 participants out of 292 were agreed with the idea. Finally, when inquired regarding the impact of all three efficiency enhancers on the economic transformation of china, 200 out of 292 agreed with the relationship. This kind of association was also found between each independent and dependent variable. It was found to have weak relationship between market efficiency, technological readiness and Chinese economic transformation, while it was discovered to have moderate kind of relationship between higher education & training and Chinese economic transformation. Therefore, it is concluded through this research that if china has to move up in the economic ladder and break the middle income trap that, it is in since 2005, it has to focus on improving at least three GCI pillars namely, market efficiency, higher education & training and technological readiness.

### **5.1 Recommendations:**

There are four recommendations concluded from this study:

1. China needs to put in place institutional mechanism to support market efficiency.
2. China needs to support the free market mechanism essential for free market economy.
3. China needs to create education system that stir and stimulate innovation, creativity and freedom of expression.
4. China needs to launch an awareness campaign regarding the technology transfer and

How it is possible.

5. China needs to emphasize on entrepreneurship and level playing business field for all Small and big business players.

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