

HUMAN CAPITAL AND SOCIAL CAPITAL AS IMPORTANT COMPONENTS OF INNOVATION ECOSYSTEMS AND ECONOMIC DEVELOPMENT¹

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Abstract

There has been a long debate on the factors and conditions that are affecting economic development and progress. It is clear that multiple components from various domains are interplaying and creating unique circumstances, which are impossible to copy and imply one by one in a different context. Moreover, none of development processes is appearing in a linear mode and past performance does not predict future success, even though it does create some pre-conditions and path dependency, which affects socio-economic development of each country and region. In this article, the authors are integrating several major aspects of economic development – namely, human capital, social capital and innovation ecosystems. The authors propose a novel framework to study economic development through the lenses of 'soft' components and argue that sustainable development is possible only when human and social capital intervene and result in innovation ecosystems, which, on their turn are supported by active and genuine collaboration of the government, academic and business sectors. To illustrate this framework, the authors focus on several cases in developing countries, which appeared as more successful or less successful and explain that through development of social and human capital.

Keywords: India, China, economic development, innovation ecosystems, social capital, human capital.

Introduction

Economic development is an interdisciplinary domain, which gained its importance and has been recognised as a separate field of study not that

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long ago (Todaro, Smith, 2006, McKinnon, 2010). However, importance of social and political values in the processes that nowadays are studied under the realm of development economics, have been recognised by the philosophers and leading thinkers of humanity (Aristotle, Erasmus of Rotterdam, Kant, Nietzsche to name just a few) for long centuries. The social context of the economic science is reflected in works of most notable political economists, such as Adam Smith, David Ricardo, Robert Malthus, Karl Marx and John Stuart Mill.

Although initially economic development focused more on issues related to economic structure and employment, later the scope widened and currently economies are perceived as social systems including both economic, so called 'hard' and noneconomic, so called 'soft' factors.

Hoff and Stiglitz (2001) suggest that development is no longer seen primarily as a process of capital accumulation, but rather as process of organisational change. According to them, the main research programs or schools of thought that should be integrated in modern economic development and thus affect the definition of research questions and future research path, are economics of information, the theory of coordination problems, and institutional economics. In these lines, the authors propose a novel framework for studying economic development with greater emphasis on human capital, social capital and innovation ecosystems, which are reinforced by the former factors. The article is structured as follows: first, theoretical background of the main concepts is presented, then a new theoretical framework is proposed and finally cases from China and India are presented where aspects of human and social capital, as well as their impact on innovation ecosystems are discussed.

Theoretical background and evolvement of the main concepts

Human Capital

The concept of human capital was first discussed in modern economic theories in the work of Adam Smith. He discussed four types of capital: i) machines for production and instruments in use for the trade; ii) buildings for revenue; iii) land for use and iv) human capital. After Smith, throughout the 1900s, the term 'human capital' was not discussed much more in literature until it was mentioned by Arthur Cecil Pigou, when defined human capital as an investment in human beings, as well as investment in material capital (Howitt, 2005). Pigou likewise discussed the relationship between economic growth, the production function, and the productivity of the workforce in regards to the per capita monetary returns. His works in general looked at the relation between the employment and the human capital of the labour force.

Following this, Jacob Mincer in 1958 was among the first to argue that differences in training caused an effect on income at the micro, or individual, level. Then, just six years later, Gary Becker (1967) began to publish his research on the subject, which was so influential that it is still commonly referred to in discussion of human capital today. He argued first of all that human capital bears a similarity to physical capital. Therefore, like, as with physical capital, the output of workers is at least partially dependent on the rate of returns of their capital. Put another way, workers who possess the requisite education, training, and skills for the needs of the economy are more productive. Given this belief, Becker ultimately recommended increased training for the labour force, for example through on the job training, general training programs, and standardisation of educational quality in formal education institutions.

All of this goes to indicate that non-physical human capital has an effective role in the growth process of a nation and that states must initially start with investing in people in order to improve economically and socially. In short, the human capital of a nation is its wealth. As will be seen below, this is especially true in populous developing states such as India and the PRC.

Initially, human capital was perceived as something that could be invested in and was analogous with the educational level of the individuals, but then in later analysis it was divided into several categories (Spiegel, 1994). Nowadays, human capital is regarded as the combination of health status of individuals, education, training, cognitive functioning, and other personal capabilities. It is commonly accepted that without considering these factors, it is impossible to explain long-term economic growth.

Traditionally, then, investing in human capital meant building more schools and making education, at all levels, both formal and informal, more available. However, as Eric Hanushuk observed in a 2013 paper, difference in economic growth among states has a close relation to cognitive skills, and that once this variable is accounted for, school attainment has no independent impact on growth. Essentially this means that it is not access to education that matters, but the quality of the education that is provided. Furthermore, as will be discussed below, today there are even further debates on what constitutes the education or training necessary for human capital development, and about how closely one should consider cultural contexts.

As it is still evolving, today, the concept of human capital can be broken down into types: general, firm specific, occupational and industry specific, and task specific. The first two were proposed already in Becker's seminal 1975 book, and the last are concepts that are more novel. General human capital, the broadest term, is comprised of education and training

that is valued by all employers, regardless of company and even more generally regardless of sector. In contrast, firm-specific human capital is that which has value at only one specific company, and is generally not transferable from one company to another. More recent has also been the idea of industry and occupational specific human capital, in which workers acquire skills specific to a certain industry, that are transferable within companies in the same industry (Gibbons, Waldman, 2004). Most specific and most recent is task specific human capital. In this conceptualisation, skills towards completing certain tasks can be learned on-the-job through practical experience, instead of through formal training. Competence in these tasks increases real wages as employees move through their careers to other companies, or advance through promotions within the same company.

The implications of this on the creation of education and training programmes cannot be understated. Often a paradox in work training programmes can exist between general and firm specific human capital, since employers are unlikely to want to provide training in general human capital, as employees can transfer it between firms, and at the same time employees are unlikely to invest in firm specific training because of its limited potential scope. This is why the novel idea of task-specific human capital is an important development, because it allows for the accumulation of skills in an experiential way, without the need for investment in formal training by either employer or employee.

Social Capital

Social capital is a proceeding concept, which acquired wide recognition among scholars of different disciplines – sociology, political sciences and economy. Although there are many studies about diverse aspects of social capital, there is no shared agreement on the meaning of this concept (Nguyen, Rieger, 2017, Hoyman et al., 2016). In sociology, the term “social capital” arose in community studies, emphasising an importance of networks providing trust and mutual co-operation in such communities (Jacobs, Tillie, 2004). Later the concept has been exploited to explain a wide range of social and economical phenomena. For instance, different valuable studies have been conducted indicating an influence of social capital on the development of human capital (Coleman, 1999), on the economic performance of firms (Nahapiet, Ghoshal, 1998, Kostova, Roth, 2003) geographic regions (Putnam, 1993, Putnam, 2000), and nations (Fukuyama, 1995).

Social capital is created in the context of society and depends on a history, development peculiarities and unique experiences of the members of any particular community (Bourdieu, 1986, Putnam, 2000, Fukuyama,

1995). If social capital is discussed from the point of view persistent in political sciences emphasising societal level of analysis and defined as “features of social organization, such as trust, norms and networks that can improve the efficiency of society by facilitating coordinating actions” (Aberg, 2000, p. 297.); it may be argued that there are some societies with low level or no social capital. However, there is a growing consensus among the authors that social capital is an ability of persons to gain benefits from specific social structures they are involved in on the basis of trust, shared norms and values (Tsai, Ghoshal, 1998, Adler, Kwon, 2002, Kwon, Adler, 2014, Ivy et al., 2018). Thus, social capital is present in every society where both formal and informal networks exist. On the other hand, it means that social structures people use for their own purposes may be destructive for the society as a whole; in the literature, such obstructive outcomes of social capital are sometimes called risks (Adler, Kwon, 2000) or dark side of social capital (Gargiulo, Benassi, 1999) or negative social capital (Portes, Landolt, 1996).

To acquire a deeper understanding of both positive and negative aspects of social capital, it is useful to analyse its different dimensions. It has been accepted among the leading scholars in the field that social capital has three main forms or clusters (Coleman, 1988, Putnam, 1993, Nahapiet, Ghoshal, 1998, Tsai, Ghoshal, 1998): structural, relational and cognitive.

Structural social capital refers to the pattern of connections between people: here the main facets are network ties and configuration (Granovetter, 2005, Burt, 2000, Oh et al., 2004). This dimension is conventionally used referring to the general model of connections between actors, meaning who is reached and how they are achieved. The most important benefit associated with this dimension is information. A classic example provided by Coleman (1988) is about a scientist who does not have time to read a huge amount of articles in related fields, but, nevertheless, is informed about the latest research trends by the means of everyday interactions with colleagues providing him with the relevant information. There is a broad scope of analysis indicating that network ties help their members to acquire information about job opportunities (Seibert et al., 2001, Gandini, 2016), innovations (Dakhli, De Clercq, 2004, Molina-Morales, Martínez-Fernández, 2010), as well as assists organizations to obtain new skills and knowledge (Yli-Renko, 2001, Inkpen, Tsang, 2005).

Relational dimension of social capital focuses on personal attitudes people have toward each other affecting their interpersonal relations, such as friendship, respect, trust, norms and sanctions, obligations and expectation. Through these personal relationships, people fulfil their social motives such as sociability, approval and prestige (Nahapiet, Ghoshal, 1998).

There are several important benefits described in a literature regarding this dimension. For example, in Putnam's model of social capital interpersonal trust (direct involvement in exchange relationships) transforms into accumulated trust in impersonal institutional arrangements (Putnam et al., 1994). Moreover, some important advantages associated with this dimension are influence, control and power. Here again, Coleman gives a hypothetical example of "Senate Club" where some senators are more influential because of being embedded in a system of relationships other colleagues do not have access to (Coleman, 1988, p.103–104). However, some other scholars are pointing out that sometimes power benefits of social capital trade off against its information benefit (Kwon, Adler, 2014). For instance, an actor gaining information benefits from many various contacts who themselves have many ties with lot of other connections will have less influence upon these contacts.

The last form of social capital is cognitive dimension, which refers to shared vision, representations, interpretations and systems of meaning among parties (Nahapiet, Goshal, 1998, Bolino et al., 2002). Although this dimension is not always discussed in a mainstream literature on social capital, the authors consider it to be significant for the analysis of undeclared work as it is closely connected with the main factors affecting involvement in informal economy. The main benefit associated with this dimension is solidarity. According to Adler and Kwon (2002, p.29) shared vision and systems of meanings "encourage compliance with local rules and customs and reduce the need for formal controls". At the societal level solidarity include civic engagement (Putnam, 2000) and at the organizational level – corporate citizenship behaviour (Adler, Kwon, 2002).

Innovation ecosystems

In recent times, the concept of innovation ecosystems has become ever increasingly popular and central in the world of economics and business. In the quest to survive and improve, businesses, industries and economies can either increase the amount of input or find more efficient and sustainable ways of utilising the same or less input to achieve more. Given the depletion of resources available on earth and the negative impacts resulting from the reckless and uncontrolled exploitation of resources on the ecosystem, it has become increasingly clear that the second option is the best and optimal resort. This is the essence and purpose of innovation ecosystems. Innovation is believed to be the fundamental source of wealth creation in an economy.

Traditionally, three main actors/sectors have emerged as the main elements of innovation ecosystems: the academia (universities), industry and government. The interaction of these three elements and the resulting

network has come to be branded as the Triple Helix Model of innovation. The adaptive collaboration of the above mentioned can be said to be the driver of innovation ecosystems.

In this model, the government plays the role of regulating industry and the market. The manner and level of interaction and regulation depends on the kind of economy and the power of the government. The government can also interact with academia in how it encourages or funds education and research and its educational policy (Etzkowitz, Zhou, 2017). The role of the government or government regulation in the structure of innovation ecosystem vis-a-vis the two other proponents has especially been subject to scrutiny, but the very essence of the triple helix posits an argument for government involvement. According to a study examining the role of the public sector in five different business networks in Norway (Larsen et al., 2018), such involvement can range from minimum low (*laissez-faire*) to the public sector assuming the role of an equal triple helix sector partner, depending on the stage of growth of the innovation ecosystems and the public sector's placement in the value chain. Many studies have been carried out using the triple helix model and have increasingly demonstrated the increasing importance of the role the government or public sector can and should play in the operations of an innovation ecosystems and many national, regional and international public sectors and governments have actively sought to, and positively influenced innovation ecosystems. Industry's role is that of mobilising resources to produce goods and services for consumers, thus the implementer and producer of the innovation ecosystems. The interactions of this sector with the others can be functional: between science and markets; and is essentially the driving force with the other two providing support.

The third actor of the triple helix model, academia, has often been attributed the role of training workers for the industry and government sector. However, universities take the pro-active stance of putting knowledge to use and creating new knowledge. The central role of knowledge creation in post-industrial times and the ever-increasing dependence on scientific, technological and social innovation to tackle current and future challenges sustainably have left universities in a challenging and new position, which is central to the functioning of the triple helix. This new centrality gives the universities the role of orchestrating multi actor innovation (Markkula, Kune, 2015).

Human Capital and Social capital as engines for accumulation of Innovation networks and enhancement of economic development

Although concepts of social capital and human capital initially developed in separated domains, latest studies and theories advocate the notion that both concepts are highly interconnected and reinforcing each other. Moreover, as the authors would argue in this article, human capital and social capital act as necessary elements to activate innovation ecosystems and bring countries to the path of sustainable economic development.

According to Marthur (1999), human capital is the “accumulated stock of skills and talents and manifests itself in the educated and skilled workers of the region”. It is sometimes measured in terms of the formation of person-years and can be increased through formal or informal education or training (Marthur, 1999). In this sense, human capital is not limited to formal education. It includes experience: practical on-the-job learning and non-traditional technical training programs to improve competence development (Davidsson, Honig, 2003). Human capital at the macroeconomic level can have many positive effects on economic development. Nevertheless, contrary to what proponents of human capital say, in both developed and developing countries, in addition to training and education, social, cultural and historical background also matter. Social capital or ties and connections between individuals and organisations on both micro and macro levels of analysis are working as the catalysis of human capital. That is why education and training are not the only or ultimate way to succeed or to achieve development of human capital in one country. Contrary to the theory of human capital, a sociological theory of participation in education and training tries to take into account all the factors – historical, geographical, cultural and social – that influence the provisions of various groups to education and training.

Indeed, analysis of human capital has usually been conducted in the field of economics, especially when discussing the Solow model. However, the sociological theory of participation, which is closely related to the social capital, draws from different fields and includes historical, geographical, cultural and social factors that affect different disposition groups. To show how these factors were neglected in traditional thinking one should note that the current orthodoxy of the human capital theory is at the same time historical and assumes that people are rational egoists who make decisions based on instrumental reasoning. This is a widely accepted version of the theory of human capital popularised by Becker and as well by famous economist Schultz (1961) who also tried to understand how individuals make decisions that lead them to undergo education and training. According to this theory, people invest in themselves to prosper

in the labour market. They weigh the costs of the current investment in education and training against the future benefits of higher income that they will earn when they stop being educated or trained and enter the job market. At the moment, they will be self-investing to be recognised by employers who realise that the education and training they have undertaken has made more productive employees, and as a result are willing to pay for them more wages.

Sociologists believe that the sociological theory of participation in education and training should consider all social and cultural entities that affect decisions in the real world. They attempt to challenge the hypothesis that human capital theory development is based on standardised rationality. According to a study by Ashton and Green, investments in human capital should not be taken for granted, but rather, explored empirically to find the circumstances in which human behaviour is built in this way. According to this theory, the usefulness of education and training on which human capital theory depends only exists when there are specific social combinations and cultural influences that cause it to be present, and conversely, this view is mostly absent in other times and in other places. Where such influences are absent, people do not benefit from education and training. The theory also argues that the creation of a human capital, no less than social capital, requires that people recognise moral authority social and social virtues, not individual ones (Fukuyama, 1995). The interpretation of this argument is that in certain circumstances, the acquisition of human capital may depend on the earlier acquisition of social capital, but it also leads to a more fundamental criticism of the idea of investing in human capital itself (Coleman, 1988). The theoretical predecessors of this idea rest, as in the writings about social capital, in the sociology of Durkheim.

As touched on previously, the theory of human capital conceptualises individuals as economic enterprises, and on the other hand, sociological theories focus much more heavily on people's social roles. This can be considered problematic because policies are designed that aim to increase our investment in human capital without the knowledge of a sociological theory can in fact only enhance the credibility of the instrument and do nothing to improve one's chances of developing a highly skilled and high-wage economy. Furthermore, it leads to problems such as ignoring community context, which then snowballs and contributes to the existence of weak institutions, inefficient inter-institutional communication, lack of requisite expertise, and inability to integrate social and cultural values in education and training system. A valid argument can be made that the policies which are not centred on social values and open for

foreign intervention have not proven to be, and may not in the future, be successful.

The role of innovations in economic development has been widely accepted since seminal works of Joseph Schumpeter. More and more evidence has been gathered illustrating inevitable need to innovate in order to reach sufficient levels of economic development ever since (Rosenberg, 1972, Huang, Xu, 1999, Wonglimpiyarat, 2006, Metcalfe, 2018, Acemoglu, 2015). Both human capital and social capital are of the utmost importance in the creation of innovation ecosystems as there is a need of a genuine and effective collaboration between the actors from various sectors and industries. Recent studies have proved importance of social capital in development of entrepreneurial and innovation ecosystems (Theodoraki et al., 2018, Russel et al., 2015). Such collaboration in innovation ecosystems is not orchestrated or regulated from above, but depends on a self-regulation methods, which imply special efforts and high motivation of each player as low commitment from any part can lead to the collapse of the whole ecosystem. This requires not only sufficient education level, but also ability to envision opportunities and benefits of collaboration which might not be comprehended without high levels of both social and human capital in a given country or region. As described in the previous section, for innovation ecosystems, as well as for national innovation systems, it is very important to have bonds and connections between governmental, business and academic sectors, which would result

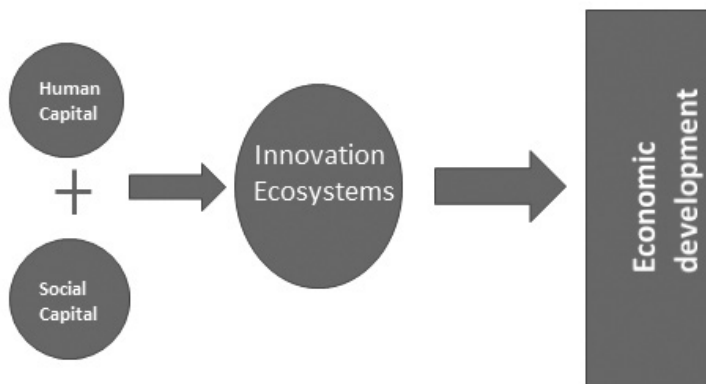


Figure 1. Necessary elements for formation of innovation ecosystems and leading to economic development

in successful institutional, as well as individual collaboration. This requires high levels of both – social and human capital. In Figure 1 below, the authors visualise the integration of human and social capital as leading factors for formation of innovation ecosystems and then creating necessary preconditions for economic development.

Case Studies: Formation of human capital, social capital and innovation ecosystems in China and India

This section examines two case studies of developing states, which have managed to effectively increase their human and social capital, as well as developed innovation ecosystems in the past several decades. China and India were chosen for analysis for their size and rapid economic development. China, with a population of almost 1.4 billion, and India with a population of almost 1.3 billion, together contain about 27% of the world's population. Their GDPs, of 12.01 trillion dollars for China and 2.60 trillion dollars for India combine to a total 14.61 trillion dollars, and even more when PPP is taken into account (CIA World Factbook, 2018a, 2018b). With populations this large, it is clear how the biggest assets these states contain in terms of economic development is their human capital. As well, it is easy to tell why, with large GDPs, and over a quarter of the world's population, human capital development in these states is important not just for their domestic economies, but for the global economy as well.

These states were likewise chosen for their success in developing human and social capital rapidly over the past several decades, as well as successful creation of innovation ecosystems and for the example their experiences can lend to other developing states in the future. Therefore the case studies continue by discussing the details of the human and social capital development policies that each state ultimately enacted and their results, as well as the reasons for the given policies' successes. They conclude by looking at room for further improvement in the development of human and social capital in each of the two states and, most importantly, the lessons that can be taken away and applied to developing states, which still lag behind.

China

The People's Republic of China (PRC) is the quintessential example of a state, which managed to so efficiently develop its human capital as to lead to significant and sustained economic growth. As late as the middle of the 20th century, the PRC remained a largely agricultural society. As a result it was underdeveloped both in terms of economic growth and in many

metrics that can be taken as indicators of economic development, among them human capital (Asian Development Bank Institute, 2015).

In the year 1962, 82% of the Chinese labour force was still employed in the low productivity agricultural sector (Dacuycuy, Lanzafame, 2014). In 1990, the first year that the human development index was released, the PRC had a score of only .502, putting it in 103 place globally (UNDP). That same year the percentage of students enrolled in secondary school was only 37%. Concurrently, and partially as a result, in 1960 the GDP of the PRC was only 59.72 billion, making it underdeveloped relative to its size and potential output (World Bank).

In 2017, just several decades later as mentioned above, the PRC had a GDP of 12.01 trillion, marking a growth of 20,000% since 1960. This makes it the biggest economy in the world today. Examining the multifaceted policies for advancing human capital that the PRC implemented at this time can help one not only to explain its rapid rise, but also help to provide a framework and policy guidance for developing state whose economies are still held back by underdeveloped human capital.

For the past two decades, the development of human capital has been central to Chinese government policy, as evidenced by the slogan “man is the root of everything.” (Ardichvili, Minia & Zavyalova, 2012). In fact, at the 2001 APEC conference, hosted by the PRC, President Jiang Zemin highlighted the need for human capital development and even laid out five concrete measures in pursuit of this goal:

- “(1) establishing a new perspective of development and strengthening human capacity building;
- (2) building a lifelong learning system and learning society;
- (3) utilising new learning technology;
- (4) promoting innovation and educating a new generation; and
- (5) strengthening international communication and collaboration.”

Furthermore, human capital development also figured prominently in the 10th 5-year plan and subsequent 11th 5-year guidelines, which shaped overarching policy goals in the PRC throughout the early 2000s. In practice these goals, because of the central focus placed upon them, were translated into concrete policies and initiatives that led to human capital growth (Yang, Wang, 2009).

In consequence, when Chinese GDP rose as a result of these efforts, so, too, did the percentage of GDP invested in education. A policy of compulsory education existed already from the 1980s, with the mandatory years of schooling rising still recently in 2010 from 8.5 to 9. This is currently coupled with an increased provision, promotion, and popularisation of tertiary education. In this respect, the PRC has for some

years already surpassed all other states, including those developed ones, in providing tertiary education (Yang and Wang, 2009). As well, this push towards increased enrolment has been coupled with a focus on monitoring and quality checks, which help to ensure standardization of educational standards (Asian Development Bank Institute, 2015). Finally, this is complemented by a system of vocational training programs, which, although waning in popularity from their heydays in the 1980s and 1990s, allow for training expansion aimed at the better matching of employee competences to labour market demands (Ardichvili, Minia & Zavyalova, 2012).

In recent years, the efforts and policies put forth by the PRC have had very tangible results. By 2013, the number of students enrolled in secondary education rose to 95%, with 48.4% of eligible students enrolled in tertiary schools (World Bank). As the transfer of workers out of the low productivity, agricultural sector was a fundamental pillar of development aspirations, in 2017, that number had dropped to only 27% (Dacuycuy, Lanzafame, 2014).

Other than the above documented radical GDP growth, the PRC managed to grow substantially in other measures of economic health and development as well. GDP per capita reached 16,700 dollars in 2017. The 2016 Gini Coefficient for the PRC, a measure of equality, was 46.5, which puts it in 31st place globally (CIA World Factbook, 2018a). Most tellingly, Chinese HDI as of 2018 was .752. While this number is still fairly low, and only slightly above the global average, it is a drastic improvement from just three decades ago.

Most, generally, human capital policies were successful in the PRC because of the central importance placed on them by the state (Asian Development Bank Institute, 2015). Since the economic reform and modernisation was launched in late 1970s, the Chinese government has paid particular attention to education, science and technology. Improving national skill level has become a national strategy integrated with China's overall strategy in economic development and modernisation.

The necessity of human capital development has been accepted likewise by firms, meaning that there was an integration of human capital development efforts between the public and private sectors, as well as even among individual families. This happened in tandem with broader structural reforms, such as the establishment of a solid labour intensive industrial base, as well as labour market reforms and an expansion of the manufacturing industry. As growth in these two areas happened at the same time, the PRC did a good job of matching vocational training to skills that were in demand and necessary for the industrialising labour market.

Later on, the PRC did a good job of re-adjusting the focus and priorities of their vocational programs when a shift to a knowledge-based economy seemed necessary.

Furthermore, and perhaps most importantly there was a focus on inclusivity and inclusive development of human capital, in an attempt to lessen inequality and bridge the development gap between richer urban and poorer rural regions of the country (Ardichvili, Minia & Zavyalova, 2012). In this regard, universal education, as discussed above, made a large impact.

This in turn also allowed eventual surplus workers to move from the agricultural to the manufacturing sector, and thus increased economic efficiency and pre-emptively dealt with the possibility of structural unemployment. As well, and specifically, one cannot leave out the impact of the one child policy, as secondary and tertiary enrolments in schools were found to be negatively correlated with fertility rates, possibly because when parents have fewer children, they can afford to invest more in each individual child's education (Asian Development Bank Institute, 2015).

Although, as evidenced above, the PRC has seen large gains in the development of human capital, some areas for further improvement still remain. Perhaps the largest challenge remains equality and inclusivity. For example, the educational gap between rural and urban areas, while shrinking, persists. As well, opportunities for educational and vocational development are often unavailable to migrant workers and their children, perpetuating poverty in this demographic group. Looking towards the future, the PRC's shrinking population may also pose a larger problem (Ardichvili, Minia & Zavyalova, 2012).

In contrast to human capital, social capital has historically been well developed within the PRC. This is due largely to the concept of *Guanxi*, or interpersonal connections, which has existed within Chinese society for centuries and which gained new importance in the second half of the 20th century (Hwang, 1987). In fact, it was commonly accepted at this time that a well-developed *guanxi* network was essential for doing business in China (Tsang, 1998). In various studies, *guanxi* was shown as crucial in obtaining a job, a promotion, or a pay raise (Knight and Yueh, 2008).

As the PRC continued its transition to a market based system at the beginning of the 21st century, some scholars predicted the role of *guanxi*, or social capital, in the labour market would decrease in importance (Fan, 2002). However, an empirical study done in the early 21st century showed that at this time social capital still played a role in Chinese urban labour markets and that indeed, social capital may even have functioned as a prerequisite and pathway for the effective building of human capital (Knight, Yueh, 2008).

Examining the importance and status of social capital in the PRC in recent years also yields some interesting trends. To examine this the authors looked at broad themes that were deemed by the OECD to be indicative of the strength of social capital within a society (OECD). The authors then examined questions from the most recent World Values Survey, conducted in 2012, that could be used as indicators of each category (World Values Survey, 2013). Namely, the broad themes the authors used to assess social capital were personal relationships, trust and co-operative norms, and civic engagement.

In the category of personal relationships, in response to the WVS question on the importance of family, 85.7% of respondents indicated that family was very important to them, while 12% indicated that family was rather important. Over half of respondents up to the age of 29 still lived with their parents (58.2%), and over a quarter of respondents from the ages of 30–49 still lived with their parents (28%). Looking at personal relationships at a level broader in response on whether respondents viewed themselves as part of their local communities, 23.3% strongly agreed, while 58.7% agreed. Finally, pertaining to the sources from which respondents got their news, about a quarter (24.2%) obtained information daily by talking to friends or colleagues. This was greater than the percentage of people who obtained information daily from the internet, email, radio, daily newspapers, and printed magazines. Furthermore, it was similar to the percentage of people (25.8%) who obtained information daily from their mobile phones.

As it pertains to trust and cooperative norms, there were several questions on the WVS that measured these metrics. There was a high degree of trust in personal relationships. 85.5% of respondents indicated that they trusted their families completely. 19% of respondents indicated that they trusted people in their neighbourhood completely and 59.4% trusted them somewhat. 13.3% indicated that they trusted people they knew personally completely, while 58.6% trusted them somewhat. Likewise, in all questions where respondents were asked about their confidence in institutions, a high level seemed to have existed. For example respondents placed a great deal or quite a lot of trust in the press (60.2%), labour unions (40.8%), the police (66.6%), the courts (71.1%), the national government (84.6%), political parties (74.5%), banks (75.3%), and environmental (56.7%) and women organisations (54.5%). As well, responses to questions on attitudes towards others showed high levels of trust. In response to a question on whether participants viewed themselves as generally trusting, only 8.6% disagreed strongly or disagreed a little, 12.5% neither agreed nor disagreed, and 60.8% either agreed a little or agreed strongly. Likewise, in response to question “do you think most people would try to take advantage of you if

they got a chance or would they be fair?” – the mean response was 6.88 on a scale 1 to 10, with 10 indicating that people would try to be fair. In response to the question on whether most people can be trusted, 60.3% of respondents indicated that they believed this to be true.

Finally, in regards to civic engagement, active membership in civil society groups, including sports and recreational organisations (2.2%), art, musical or educational organisations (1.3%), labour unions (.8%), environmental organisations (.5%), professional organisations (.3%), and humane or charitable organisations (.4%) remained low. In fact, in many instances these numbers marked a decrease from those in the 1990 WVS. When respondents were asked about other aspects of civic engagement, such as voting at the national level, numbers were also low, with 74.7% of respondents claiming they never voted. However, there was a difference when examining voting at the local level, with 47.8% of respondents claiming that they always or usually voted, and 40.9% claiming that they never did. Likewise, in response to whether they identified with the statement “it is important to help people living nearby; to care for their needs” 92.3% of respondents, said that this characteristic was at least little like them.

The PRC’s current strong record in developing innovation ecosystem can be attributed to the significant reforms in key areas, including research and education reforms, protection of the intellectual property and legal environment. Regarding one of the most crucial component of the healthy innovation ecosystem, it has to be noticed that co-operation between academia and industry, has been possible thanks to the pro-active role of companies that are the main vehicle in driving and facilitating such cooperation. One of the substantial obstacles to the reinvigoration of Chinese ecosystem was the traditionally rooted gap between academic field and industry (World Economic Forum, 2016, p. 5). Today, however, co-operation between universities and enterprises has been growing thanks to the multiplication of technology parks and incubators pointing to the fact that fruitful results of this collaboration are yet to be observed. Moreover, it should be noted that successful development of the PRC’s innovation ecosystem has its roots in the reforms related to the legal framework including Intellectual Property Rights that, as a matter of fact, could be deemed one of the most controversial aspects of the Chinese policy environment. Protection of technology and innovation by issuing patents is crucial for any innovation to take place insofar as it creates incentives, and encourages a rather enthusiastic environment among actors that participate in the Research and Design activities. At the core of the reforms that aimed at increased number of patents and protection of technology was the establishment of the IPR courts in 2014

in the largest, technology-oriented cities such as Beijing, Shanghai and Guangzhou (World Economic Forum, 2016, p. 10). Although, the reforms aiming at creation of the more innovation-conducive environment should not be diminished, it needs to be noticed that this area still remains as one of the most fragile and problematic. Recent strategies that are centred on developing strong intellectual property protection, as well as enhancing operating conditions for high-technology enterprises, by tax and fiscal policy reform and reduction of corporate tax and Value Added Tax should not be perceived as the guarantors of ongoing innovation success (World Economic Forum, 2016, p. 10). In order to safeguard the future of innovation in the PRC, it is necessary to reassure the accurate implementation and execution of the aforementioned initiatives, as well as to work on its expansion while removing the remaining barriers. Future challenges are related to the SME's, which despite the reduced regulations are still facing impediments that prevent them from entering the market. Although the forecasts for the innovation ecosystem seem to be rather positive, one of the pertaining problems with country's innovation performance is the actual lack of sufficient innovation. While the prevailing strategy that has been embraced by the Chinese companies consists of creating of the new versions of the pre-existing technologies, the country has very little to offer in terms of novel products. As the legacy of manufacturing excellence alone will be not sufficient in order for the Chinese companies to compete globally, it is crucial to overcome the infancy stage of innovation in the country (Frenkel, Maital, 2014, p. 189). In doing so, the role of the Government in promoting innovation, creating incentives, as well as implementing more innovation-oriented regulations will be vital.

On the other side of the spectrum of factors that weaken innovation ecosystem is the insufficient IPR protection. This area seems particularly vulnerable, as it might be one of the main causes of low level of innovation. In order for the PRC to move forward, it is important that it shift from being a manufacturing hub to becoming an innovation centre. For the latter to be achieved, it is necessary to pursue sufficient levels of Intellectual Property protection as the essential prerequisite for success of many other reforms. All the forward-looking measures should be calibrated to protect the Chinese enterprises and the people working in R&D in the first place.

India

Human capital development was initially pursued in India because, like the PRC, it had a large population, and its human potential was its greatest resource. However, in 1960, the GDP of India was only 36.54 billion dollars. By 2017, this number was 2.60 trillion (World Bank). The secondary school

enrolment rate was 78.92%, which, in a populous state has a large impact. Labour force distribution at this time is hard to document, because of lack of adequate data, however, it is generally acknowledged that at this time many people were self-employed, or employed in the informal economy (Srinivasan, 2006). Life expectancy was only 41 years (World Bank). Consequently, by 1990, India's HDI was only .427, putting it in 114th place globally (UNDP).

Throughout the 21st century, India has been making efforts towards reform of its education system, with a focus on several broad areas. This includes increasing investment in education, increasing the number of educational institutions, increasing the number of vocational institutions, and a focus on quality and access (Asian Development Bank Institute, 2015).

In regards to primary and secondary education, in terms of legislation, first came the Sarva Shiksha Abhiyan (SSA), with its goal of achieving "learning for all," (Ardichvili, Minia & Zavyalova, 2012). There was a focus on increasing the quality of education, especially in STEM fields, and on reducing gender disparity. This was followed by The Right of Children to Free and Compulsory Education Act, which mandated free elementary education for children up to the age of 14, was enacted in 2009. This act included free uniforms, textbooks, supplies and indirect costs for qualifying low-income families (Asian Development Bank Institute, 2015). This act as well tried to ensure quality controls on education provided.

In addition, educational development programs are supported by further legislation meant to keep children in school, such a mid-day meal program for children in schools, and free school supplies for qualifying low-income children under the SSA. As well, in 2006 a law was passed that prohibited children under 18 from engaging in low paid work instead of attending school. In line with its efforts towards financial investment, from 2002–2006, the SSA budget was .3% of India's total GDP (Ardichvili, Minia & Zavyalova, 2012).

Despite efforts to the contrary, the Indian economy did not experience much structural reform. All sectors experienced an absolute increase in employment, but as of 2012, agriculture still accounted for about half of total employment, In addition, only about 12% of nonfarm jobs were in manufacturing, with 40% in low skilled construction. Nonfarm jobs only increased so much as to remain steady with the rest of the labour force. As a result, the number of farm workers up to had 2010 remained steady, while the number of available jobs in agriculture decreased, and these workers were unable to shift into more productive sectors, underutilising their human capital (Asian Development Bank Institute, 2015).

However, the biggest gains were made in the educational sector, with the opening of new universities and vocational and technological programs. At the primary level, the SSA program was successful in increasing school enrolment, and in decreasing inequality in access to education due to gender and income.

Overall, Indian economic reforms, did spur increased development (Asian Development Bank Institute, 2015). In 2017, as mentioned above, GDP had risen to 2.6 trillion dollars, making India the world's third largest economy. Income per capita for the same year was at this time was 7,200 dollars (CIA World Factbook India, 2018). The primary school enrolment rate was 114%, and life expectancy increased by almost 30 years from 41 to 69 (World Bank). There was also a substantial decline in the total fertility rates or the average number of births per woman from 5.5 in 1970 to 2.6. Already in 2011 India's Gini coefficient was .35, lower than that of the PRC (CIA World Factbook, 2018). This contradiction between increased human capital development in terms of education on one hand, and persistent inequality on the other is reflected in India's 2018 HDI ranking, at just 130th place globally, with a score of .64. While this is low, it still however marks nearly a 50% increase since 1990 (UNDP).

To the extent that human capital development has been successful in India, this has been a result of recognition and utilisation of intellectual potential. (Ardichvili, Minia & Zavyalova, 2012). At the primary level, policies that not only mandate, but also support, school attendance have had a positive impact on attendance rates. That is to say, the efficacy comes not just from making attendance mandatory, but providing policies and support, such as free lunches and supplies, that allows children to complete their schooling. This is combined with a focus on the technology sector, which is a relevant and profitable field and makes both Indian workers and companies competitive globally.

Although India has made significant gains in the development of human capital, much room for improvement still remains, especially given the potential of the large population. The inability of the above listed policies to induce structural change continues to contribute to relatively high levels of poverty and inequality. Among existing divides in equality are religious, regional, gender, and class. As well, these structural problems contribute to a mismatch between the skills possessed by graduates of vocational programs and those needed by emerging sectors in the economy, which is evident in the high number of people still employed in the agricultural sector. Furthermore, while there are now a large and varied number of educational institutions in India at all levels, their quality varies widely, at the university level especially.

Compared to the PRC, articles on the history of social capital in India are relatively hard to come by. This may be because, relative to Chinese society, Indian society is more fragmented and diverse with different regions having vastly different histories, cultures, traditions, and precedents. Indeed, even recent articles on social capital in India largely focus on case studies within specific regions, and not on the Indian state as a whole. However, the authors likewise examined answers on to the same questions used for the above case study of the PRC. The data came from the World Values Survey conducted in India in 2012.

In the category of personal relationships, in response to the WVS question on the importance of family, 94.9% of respondents indicated that family was very important to them, while 49.6% and 40.4% indicated that friends were very important. 73.1% of respondents under the age of 29 still lived with their parents, as did 53.5% of those aged 30–49. On a broader level, 53.9% of respondents strongly agreed that they viewed themselves as part of their local communities, while 33.3% agreed. Furthermore, V74 – importance of good in society. Finally, in regards to the sources from which respondents obtained new information, 34.7% received it through talking with friends or colleagues daily. This is less than the amount of respondents who received daily news from each the TV (54%), daily newspapers (47.3%) and mobile phones (44.9%).

When discussing co-operation and norms, trust at the individual level was high. 91.3% of respondents indicated that they trusted their families completely. 34.1% indicated that they trusted people in their neighbourhood completely and 52.6% trusted those in their neighbourhood somewhat. In regards to people known personally, 30.1% of respondents claimed that they trust them completely, and 47.7% that they trust them somewhat. When examining trust and confidence in institutions, there was a high level of trust in civil society press (65.9%) labour unions (54.7%) the police (49.1%) the courts (61.3%) the national government (45.7%), political parties (34.3%) major companies (43.4%) banks (80.4%), environmental organisations (58.2%) women's organisations (64.5%). In response to the question “do you think most people would try to take advantage of you if they got a chance or would they be fair?” the mean response was 4.97 on a scale 1 to 10, with 10 indicating that people would try to be fair. In response to a question on whether most people can be trusted, only 16.7% of respondents believed this to be true. A question about whether respondents viewed themselves as trusting was not asked on the Indian WVS, so no data exist for this metric.

Finally, on measures of civic engagement, active membership was higher than in the PRC in all categories, including sports and recreational organisations (7.8%), art, musical, or educational organisations (7.5%),

labour unions (6.3%), environmental organisations (4.8%) professional association (5.7%) , and humane and charitable organisations (5.1). It is also worth noting that 14% of respondents were associated in church or religious organisations. When asked about national level voting, 83.1% of respondents indicated that they always vote, while 11.2% said that they usually do so. At the local election level, responses were similar, with 83.1% of respondents again indicating that they always vote, and 9.5% indicating that they usually do so. The question measuring on whether respondents identified with the phrase “It is important to help people living nearby; to care for their needs” was not asked on the Indian WVS, so no data exist for this metric.

The roots of the current innovation ecosystem in India are closely tied with the demographic profile of the country and its large population. As a matter of fact, the origins of the innovation scene in India can be traced back to the social problems that country has been facing such as pertaining unemployment among the youngest groups. While the government’s focus in the past years has been on creating job opportunities with the goal of leveraging educated youth, the new opportunities emerged that could effectively facilitate the achievement of this goal. Entrepreneurship began to be perceived in India as an essential window of opportunity that could lead to the job creation while creating economic growth (Abhyankar, 2014, p. 11). By envisaging multiple benefits stemming from promotion of entrepreneurship, government of India has been putting innovation at the centre of its efforts in the recent years. At the core of its strategy was the support for innovation that would lead to the multiplication of the entrepreneurial activities, which in turn will pave the way for the economic growth. The implications of this logic can be reflected in the numerous initiatives that were undertaken by the Indian government in the past years.

In addition to the fiscal incentives that were offered towards the R&D activities performed by the universities and public research institutes, the government of India has announced its official commitment by declaring the period of 2010–2020 to be the “Decade of Innovation,” and by establishing National Innovation Council as the main body responsible for scientific, technological and innovation enhancing developments. The establishment of the centralized council whose mandate is to coordinate the standalone activities seems to be of paramount importance for India. As the current national innovation ecosystem has been fragmented with no uniform policy regarding innovation and entrepreneurship, it will be an essential step for the country to start the reform by establishing the proper policy framework (Abhyankar, 2014, p. 13). Despite the aforementioned factors that impede realisation of the innovative potential of the country, it

seems that entrepreneurship-oriented reforms will be necessary to address the deeper roots of the problem.

As it occurs, in the similar way as it has been the case in China, the innovation ecosystem in India has been suffering from the inadequate intellectual property protection (Abhyankar, 2014, p. 14). In India, however, the lack of sufficient protection regime is rooted in the structural and legal problems. The fact that entrepreneurs in India are rather lukewarm in demanding the protection for their work owes to the perplexing reality of costly and time-consuming process of patent issuing. Such structural problems can severely disincentive present, as well as potential entrepreneurs and impede their open access to innovation. Drawing back on the Indian experience, that future trajectory of the innovation that is expected to expand is to a large extent dependent on the amount of legal protection that the government of India is willing to yield to enhance the innovation processes.

Conclusions

Taking the differing cases of China and India, some broad general conclusion can be drawn. The PRC and India have managed to successfully develop their human capital in large part because they invested not only in creating more educational opportunities or in matching the education offered with the needs of the economy, but mainly because they focused on the quality of education offered.

Despite the inequalities that still exists in terms of standards of education in these two states, they have both successfully managed to systematise their education systems to the extent that they ended up having large segments of their population, which are well educated and well trained. Furthermore, the importance of the role of government and the coherency of policy in the two successful cases cannot be understated. In these cases, standardisation of educational systems occurred through generally cohesive and centralised policy efforts. Furthermore, supplementary policies that addressed local barriers to school attendance, such as free lunches and supplies in India, played an important role. In this way, one can also see support for sociological theories of education, human and social capital accumulation, which emphasise the fact that human capital growth is not possible without considering local contexts.

Finally, and perhaps most importantly, the PRC and India, when they saw initial GDP growth after experiencing development in human capital, invested money back into human capital development. This is especially significant when one remembers the Solow model with added human capital, wherein human capital, like physical capital, depreciates and must

be invested in. The PRC and India understood that investing in education and training is not a one-time thing, but rather a cycle of growth, and reinvestment, and further growth.

Therefore, in conclusion, there is little debate that human capital development is of paramount importance to broader economic development and growth, especially in developing states, where the stakes and potential benefits are high. The biggest debate today rests in how to best actually develop human capital. Whether through classical education and training, or through more constructive sociological methods, taking into account the important of social capital development in the local communities, as well as focus on the quality of education, coherent government policy, and reinvestment back into training and education.

When examining the differences between indicators of social capital in the PRC and in India, several things stand out. The first being that initially, India appears to have higher levels of social capital, as measured through trust and connections between individuals. In India, there is higher participation in civil society than in the PRC, both in terms of participation in civil society groups and in election participation. Likewise, it seems that respondents from India trusted those in their families, in their communities, and among their personal acquaintances, more than respondents from the PRC did.

However, in India this trust seems to be reserved solely for those close to an individual. It does not extend to perception of people in general, as indicated by the low response on whether people can be trusted (16.7%), or trust in institutions, which remains largely lower than in the PRC. In contrast, in the PRC there appeared to be trust that extended past an individuals family and immediate acquaintances, as indicated by the high response on whether people can be trusted (60.3%). This may be significant because of the importance of bridging social capital in a state's economic development. Increased trust in society in general could potentially lead to further bridging social capital with people outside of an individual's social circle, which would lead to better employment prospects for the individual. Conversely, in India, the high level of trust for those in one's social circle, and the relative mistrust of outsiders, could lead to the maintenance of bonding social capital over the creation of bridging social capital, which may limit individuals opportunities and on the social level lead to suboptimal growth.

Likewise, the higher levels of institutional confidence in the PRC could lead to individuals being more likely to trust institutions, and therefore being more likely to participate within them and ultimately benefit from them. Finally, the fact that many Chinese respondents obtained new information daily from friends and colleagues shows a higher level of

informal information sharing within Chinese society than within Indian. As discussed above, this can be an important indicator of the extent of social capital within a society.

As evident from both cases, gradual development of human and social capital has led to the evolvement of innovation ecosystems, which are playing an important role for the current economic development of both countries.

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