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Emerging Tech Entities and Innovation: Case of Chinese Tech Companies

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Technology is the leading sector in terms of market capitalisation ahead of the financial sector and consumer goods. The rise of the technology sector in terms of market capitalisation is just three decades old. After the advent of the integrated circuit, microprocessor and internet, technology has become the leader in market capitalisation. Technology (tech) entities derive their importance from assisting financial and consumer goods sector. Tech entities are the service provider and the reason for their unprecedented progress is that tech entity cut across the sectors. Technology has greatly boosted the financial sector and has equally contributed to the consumer goods industries. Because of the deep penetration of technology in every facet of life, it has become difficult to isolate the technological component from daily life transactions.

In the context of this background, the paper would discuss the innovations and progress made by Chinese tech companies. Chinese tech companies have established global outreach in recent years, not only Chinese mobile hardware firms and telecom equipment companies of China, but various e-commerce companies have also established themselves globally.

Evaluating China's Plan to become an Innovative Society

China for a long time has been characterised as a manufacturing hub of low value-added products. China has been characterised as the factory of innovative nations like the United States and Europe. Most of the innovations and designs are developed outside Chinese territory; however, due to low cost and relatively trained labour force, most of the companies have outsourced their manufacturing contracts to China. However, Tim Cook, CEO of Apple Inc. differs, at Fortune Global Forum in Guanzhou, Tim Cook stated the reason why Apple Inc. prefer China to manufacture their iPhones (Glenn, 2017)

> The number one reason why we like to be in China is the people. China has extraordinary skills. And the part that's the most unknown is there's almost 2 million application developers in China that write apps for the iOS App Store. These are some of the most innovative mobile apps in the world, and the entrepreneurs that run them are some of the most inspiring and entrepreneurial in the world. Those are sold not only here but exported around the world.

Since the initiation of market reforms and opening up, China is heavily dependent on

exports and investment from abroad. China's export was primarily concentrated in low-cost products. With China's continuous economic growth, the growth, the costs of this growth mode (low-end technology, labour-intensive products) have become increasingly large, including resource depletion, environmental destruction, and increase in international trade disputes. The external environment for China's development has changed deeply and extensively. Demands are thus generated for China to transform its mode of growth as soon as possible from a conventional growth model based on resources, capital and labour to the new mode based primarily on innovation (Zhao and Yang, 2012).

Since its entry into the WTO, China has experienced rapid growth in its high-tech industry. China has jumped into the front ranks of the world in terms of scale by assuming a dynamic role in the globalisation process. In recent years investments in R&D activities and personnel for China's high-tech industry have increased dramatically. R&D expenditures expanded rapidly from RMB 36.25 billion in 2005 to RMB 96.78 billion in 2010, increasing 170 per cent in six years. R&D personnel rose from 173000 people in 2005 to 399000 people in 2010, an increase of 130 per cent in six years. Buoyed by these investments, out of high-tech industry has shown dramatic improvement. In 2005 there were less than 10000 patents related to inventions in China high-tech industry, but in 2010 this figure increased to 35000 patents related to inventions. At the same time, the number of invention patents in force owned by China's high-tech industry had increased to more than 50000 in 2010 (Ibid).

China's science and technology competence is growing, and it can be ascertained by the number of scientific papers published in the international journal, the number of patents filed by China, and China's expenditure on research and development (R&D) (Linda, 2007). As the world economy is inching towards becoming more knowledge-oriented, China is acknowledging the importance of knowledge and its dissemination. As proven by the statement of Tim Cook, China is shifting from being a destination of low-end labour-intensive manufacturing to high technology manufacturing. China has built most of its high-tech industry by relying on imported technology. For instance, in 2005, 88 per cent of Chinese high-tech exports were produced by foreign-owned firms. Therefore, globally, China is still a net importer of technology. However, China has realised the importance of knowledge and indigenously developed technology, and for that China is investing heavily in the production of science and technology.

China's general expenditure on S&T (Science and Technology) in 1997 was $6.1 billion which increased to $30.1 billion in 2005. It is a massive increase of 400 per cent. Similarly, government expenditure on S&T also increased dramatically in the mentioned period from $4.9 billion in 1997 to $16.7 billion in 2005. China has benefitted from the benevolence of government, the export of high-tech product increased more than thirteen-fold in 2005 from that of 1997. In 1997 the value of high-tech export was $16.3 billion which increased to $218.3 billion in 2005. It is a massive increase in the export of high-tech products (Ibid). As a result of this China produces more engineering bachelors' degree than South Korea, Japan, United States, Germany France and Taiwan combined. China produces almost twice the number of doctorates of engineering as the United States. Now China ranks second only to the United States in total investment in R& D (Atkinson, 2012)

China has recognized the fact that the path to prosperity is through *zizhu chuangxin* which roughly translates indigenous innovation. In its seminal document ‘Guidelines for the Implementation of the National Medium and Long term Program for Science and Technology (2006-2020), China has charted out its growth plans and strategies. The Medium and Long term Program is envisaged to ‘create an environment for encouraging innovation independently, promote enterprise to become the main body of making technological innovation and strive to build an innovative type society'(Ibid).

The important point to note in China's Medium and Long term Program (MLP) is to ‘create an environment for encouraging innovation independently'. Here the keyword is ‘independently'. China is generally accused of infringing patent rights and forcing multinationals to transfer technology to access the Chinese market. Allegations of forceful

transfer of technology dent the image of China, and hampers investments. Therefore, China focuses on the independent development of technology. China has aimed at mastering most of the core technologies through its MLP. China has made a strategic decision to take the Chinese economy from low technology products to a high-tech economy. China's Medium and Long term Program indicated a distinctive shift in China's economic policy.

China is aggressively following the roadmap it has set. And the fruits of China's efforts can be witnessed in the area of computing and electronics. For instance, in 2011 China proclaimed that it had developed the world's fastest computer overtaking the United States (Ibid).

Apart from ‘independently' another keyword that features in China's MLP is ‘enterprise with a focus on Chinese firms'. One of the objectives of China's MLP is to ‘promote enterprise to become the main body of making technological innovation.' China has focused on technology firms as the drivers of innovation.

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Success Story of Chinese Tech Companies

The paper would highlight the success of China's high-tech companies and how these companies have created a niche for themselves. The section would not cover all the firms of the industry; however, it would discuss some of the famous companies which have made into headlines.

Alibaba

Alibaba is the most commonly associated name with Chinese tech companies. Founders of Alibaba first realised the potential of the internet as a level playing field. Founders of Alibaba believed that ‘internet would level the playing field by enabling small enterprises to leverage innovation and technology to grow and compete more effectively in the domestic and global economies' (Alibaba, 2018). Jack Ma's initial realisation about the potential of the internet along with company motto to embrace change has made Alibaba the world leader in e-commerce business. Today sales of Alibaba group is more than that of eBay and Amazon combined. Not only Alibaba acts as a platform where buyer and seller transact, but Alibaba has also delved into the payment system, which makes payment issues less cumbersome. Alipay (Alibaba payment system) processes more than half-trillion-dollar annually. Apart from B2B (Business to Business), Alibaba has forayed into B2C (Business to Consumer) business on the lines of Amazon and eBay (Tse, 2016). However, in Alibaba's retail business one can witness innovations in product mix compared to its western counterpart. For instance, Taobao (Alibaba's B2C business) not only sells merchandise like Amazon and eBay, but it also sells NPL (Non-Performing Loans) of banks on its website (Bloomberg, 2017). Therefore, there is a large variety of product mix offered on Alibaba group of companies, which is less visible in Western e-commerce companies.

Xiaomi

Xiaomi is the prime example of creating a niche in an overpopulated segment of smartphones. Xiaomi has radicalised the distribution network because of which it is not only able to sell it mobile phones cheap, it has created a passionate customer base that like of iPhone. However, there is a difference. Apple which put a premium on its phone, Xiaomi sells its phone just above the cost (Tse, 2016). Apart from selling smartphones, Xiaommi generates most of its revenue from the sale of software and online sales of services. However, due to reliance on online sales, Xiaomi trailed in rural areas, so the company decided to go into agreement with offline retail stores. But the company wanted to foray beyond the smartphones, and develop a strong bond with consumers. Xiaomi's solution was to create an ‘ecosystem' of some 100 startups to provide Xiaomi with internet-connected home and tech products that would draw customers to its stores. For instance, Xiaomi financed a startup to develop a low-cost efficient air purifier. The result: Mi Air Purifier 2, which sells for the fraction of cost of other quality air purifier. It is connected to a smartphone allowing users to

monitor the air in their home and alerts users when filters need to be changed. The Air Purifier was a massive hit; similarly, Xiaomi improved the efficiency of battery in the fitness band, and become the world leader in the fitness band segment (Kline, 2017). The ability of the company to change its strategy and adapt to the changing condition has ensured the survival of the company in the fiercely competitive market.

Tencent

Tencent has become an integral part of Chinese lives. Chinese users collectively spend 1.7 billion hours each day on the company's app (Sweney, 2018). It is the first company in Asia to cross the $500 billion market capitalisation, yet strangely, few people in the West have heard about Tencent. It is the company which has developed the WeChat known as the Chinese super app. WeChat is not just a messaging app like WhatsApp and Facebook. WeChat is an ecosystem in itself. One can book an appointment with a doctor, can pay traffic fines and apply for visa application through this app, besides its payment system and e-commerce (Ibid). However, unlike its western counterpart, a fraction of its revenue comes from advertisement. A large part of Tencent's revenue comes from gaming and value-added services like video streaming service and digital music service on the line of Netflix and Spotify. Tencent continuous product development and its ability to innovate has made sure that it never lags behind its western counterpart (Mittal, 2018)

Huawei

Huawei has the most global outreach among all the Chinese tech companies. Huawei's international presence can be gauged from the fact that Huawei is the only Chinese company which Microsoft Word spellchecker does not detect as some foreign word. Two third of Huawei revenues come from the overseas, this makes Huawei the biggest private exporter of China (Tse, 2016). In terms of innovation, as measured by the numbers of patents filed, Huawei is the leader in innovation in China. Huawei was the biggest filer of patents with the European Patent Office (EPO) in 2017, making it the first Chinese company to reach the number-one spot (Huawei, 2017). In 2017, 166,000 patent applications were received by EPO. Huawei filed 2,398 patents with EPO making it the top filer of 2017. Of its 180,000 employees worldwide, about 80,000 are engaged in some form of R&D. Every year Huawei invests at least 10 per cent of its annual revenue in R&D (Ibid).

Huawei filed 2,398 patents with EPO making it the top filer of 2017. Of its 180,000 employees worldwide, about 80,000 are engaged in some form of R&D

China's Tech Industry and Innovation

Though China's tech companies now own many patents, and the numbers of patents are only increasing year on year, but the success of many Chinese companies barring few (Huawei) is largely dependent on the local market condition, and China's policy (Tse, 2016)

Atkinson has mentioned some polices that has helped China's tech companies to succeed. He has termed these strategies as 'bad policies'. According to Atkinson, government procurement focused on forced technology transfer, market access tied to forced transfer of technology, weak and discriminatory patent system and IP theft are the issue that needs to be addressed to assess the true innovation of China's tech companies (Atkinson, 2012). The accusation is not based on the facts, and there exists little empirical study to support the allegation (Love, Helmers and Eberhardt, 2016). Contrary to the conventional wisdom that China's patent system favours domestic firms at the expense of foreign firms, the empirical finding suggests that the Chinese patent system has accomplished the opposite (Ibid). Foreign firms appear in the Chinese courts as 'patent enforcers', not as accused infringers, and win the cases as often as Chinese companies (Ibid.). The accusation of patent infringement might have some grain of truth; nevertheless, it is blown out of proportion in the case of China. Moreover, patent infringement is not unique to China, and many developed nations including Japan has

been accused of patent infringement in their process of industrialisation.

China's tech companies have grown immensely in market size; however, these companies lack global outreach (barring Huawei and Alibaba). The tremendous market size of China's high-tech companies has to do less with technological innovation and more to do with the marketing innovation. China's tech companies are unique in a way to cater to the need of Chinese consumers which other companies have so far failed (except Apple Inc.). Similarly, in their home turf that is China, because of unjustified government support and their marketing innovation China's tech companies have expanded in size dwarfing some of the global giants.

Conclusion

China's high-tech industry has grown in size, and consequently investment in R&D in the high-tech industry has grown immensely. As a result of large market access and investments, numbers of patents, which are an indicator of innovation, have grown dramatically. There are many barriers for foreign firms to enter the Chinese market. Western counterparts also failed to understand the Chinese people's preference. For instance, unlike the western consumer, Chinese people are comfortable with cluttering as they want a chaotic bazaar type experience when they shop online. This preference of Chinese people is exploited by Chinese tech companies as can be witnessed in WeChat, Taobao.com and QQ.com (Sampi, 2018). There is some element of truth to the claim regarding patent infringement and forced technology transfer by China. However, forced technology transfer is the premium western companies pay to have access to the Chinese market. Regarding, patents infringement, there are some concerns, but at the same time, China is investing heavily in R&D. China's new policy is to make more investments in innovation and research. China is already the world leader in research on Artificial Intelligence (AI). However, to conclude that the current status of China's tech companies is because of innovation only is misleading. The success of Chinese Tech companies is largely due to market-oriented innovation, rather than technological innovation. Therefore, it can be said that it is a mix of market innovation and technological innovation alongside the government support, which keeps the foreign company at bay and investing heavily in R&D is the reason for the success of Chinese tech companies. ■

REFERENCES

May 10 2012. Testimony before the U.S. - China Economic and Security Review Commission.

Culture and Values. https://www.alibabagroup.com/en/about/culture (accessed on 25 November 2018)

Huawei Top Filer with European Patent Office in 2017 - Huawei Press Center. 2018, March 08,http://www.huawei.com/en/press-events/news/2018/3/Huawei-Top-Filer-European-Patent-Office (accessed on 3 December 2018)

Jakobson, Linda. 2007. *Innovation with Chinese characteristics: High-tech research in China*. Basingstoke: Palgrave Macmillan.

Kline, D. 2017. Behind the Fall and Rise of China's Xiaomi, 28 November, https://www.wired.com/story/behind-the-fall-and-rise-of-china-xiaomi/ (accessed on 28 November 2018).

Leibowitz, G.2017. Apple CEO Tim Cook: This Is the Number 1 Reason We Make iPhones in China (It's Not What You Think), 21 December,http://www.inc.com/glenn-leibowitz/apple-ceo-tim-cook-this-is-number-1-reason-we-make-iphones-in-china-its-not-what-you-think.html (accessed on 15 November 2018).

Love, Brian, Helmers, Christine and Eberhardt, Markus. 2016. Patent Litigation in China: Protecting Rights or the Local Economy?. https://digitalcommons.law.scu.edu/facpubs/918/ (accessed 2 December 2018)

Mittal, T. 2018. Tencent: China's answer to nearly everything, 25 January,https://yourstory.com/2018/01/tech-giant-tencent-china/ (accessed 30 November 2018)

Shoppers Can Buy Bad Debt on China's Equivalent of Ebay. 2017, 11 July, https://www.bloomberg.com/news/articles/2017-07-10/in-china-shoppers-can-buy-bad-loans-online-with-their-groceries (accessed on 23 November 2018)

Sweney, M. 2018. Tencent, the $500bn Chinese tech firm you may never have heard of, 13 January, https://www.theguardian.com/business/2018/jan/13/tencent-the-500bn-chinese-tech-firm-you-may-never-have-heard-of (accessed on 29 November 2018)

Tse, Edward. 2016. *Chinas disruptors: How Alibaba, Xiaomi, Tencent and other companies are changing the rules of business*. London: Portfolio/Penguin.

Why Do Chinese Websites Seem So Cluttered?. 2018, January 24,https://sampi.co/why-do-chinese-websites-seem-so-cluttered/ (accessed on 5 December 2018)

Zhao, Zhiyun and Yang, Chaofeng. 2012. An Empirical Study of China's High-Tech Industry Innovation Capability in Transition, in McKay, Huw and Song, Ligang (eds.). *Rebalancing and Sustaining Growth in China*. ANU Press.

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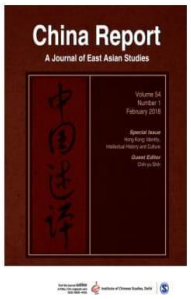

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