

## Comments on Industrial Cooperation and Innovation

Lawrence J. Lau<sup>1</sup>

Brussels, Wednesday, 13 September 2017

There are many opportunities for innovation and industrial cooperation and collaboration between the EU and China. With a few exceptions, the EU is higher than China in terms of its achieved levels of science and technology. Moreover, the EU has been devoting more resources in R&D than China, both historically and currently. The EU aims to achieve an R&D expenditure to GDP ratio of 3% by 2020, whereas China aims to achieve only 2.5% by 2020. Moreover, the GDP of EU (US\$16.4 trillion in 2016) is almost one and a half time that of China's (US\$11.2 trillion in 2016). The EU's total R&D expenditure will be 75% higher than that of China's by 2020.

China has been trying to play catch-up. She is now the world's leader in terms of the number of articles published in scientific and engineering journals and the number of patents granted (the average quality of these articles and patents is of course another issue). China has two additional advantages—it has a huge domestic market, which means that the cost of discoveries and inventions can be much more easily amortized once the stage of commercialization is reached; and it has an abundance of relatively low-cost scientific and technical manpower, having become the world's largest producer of doctoral degrees in science and engineering. As we know, the size of the market is critical to the success of innovation. That is one of the reasons why the U.S. has been so much more commercially successful in innovation than the EU. Moreover, the proportion of total expenditure devoted to basic research in China is low, around only 5%, compared to approximately 15% for the U.K., and 20% for Germany and the U.S. However, basic research is fundamental to breakthrough discoveries and inventions. All of this means that there can be significant gains to both the EU and China from their mutual cooperation and collaboration in R&D, exploiting the complementarity between them and achieving risk-sharing and diversification at the same time.

The challenge is of course in the mutual explicit recognition and protection of each other's intellectual property rights, which is absolutely essential to any successful innovation cooperation and collaboration. Chinese protection of intellectual property rights, both domestic and foreign, has improved significantly since 2013 and has continued to improve. This is an inevitable and irreversible consequence of China transforming into also a creator of intellectual property from only a user of intellectual property.

One can distinguish between public sector and private sector cooperation and collaboration in innovation activities. Public sector cooperation and collaboration takes place between governments and other public organizations whereas private cooperation and collaboration takes place between profit-making enterprises. Public sector cooperation and collaboration is driven by perceived public need whereas private sector cooperation and collaboration is motivated by potential profits. The former is typically non-market-based and the latter is market-based.

Basic research is an area in which both the EU and China can cooperate and collaborate successfully because there is not as much conflict of commercial or other interest. The results of such research can be jointly owned or be put into the public domain. CERN, the European Organization for Nuclear Research, is a very successful example of international cooperation and collaboration in R&D in basic research. The discoveries at CERN are sufficiently far removed from commercial exploitability that the appropriate assignment of intellectual property rights should not be a contentious issue. I believe China already has a co-operation agreement with CERN. Another

---

<sup>1</sup> Ralph and Claire Landau Professor of Economics, Lau Chor Tak Institute of Global Economics and Finance, The Chinese University of Hong Kong. These comments were delivered at the Launch Meeting of the Report: EU-China Economic Relations: Looking to 2025, Session on Industrial Cooperation and Innovation, Brussels, 13 September 2017.

possible focus is space exploration that is unrelated to military use. There is no need for the EU and China to duplicate their efforts in this field. In a couple of years, China will become the only country with a working space station for at least a while. So there can be major synergies and savings. China leads in research in a few limited areas such as quantum communication, genomics and super-computers, areas in which cooperation and collaboration between the EU and China can be very promising.

Historically, the ties between European and Chinese academics were strong. Prof. Shiing-Shen CHERN, one of the foremost mathematicians of the Twentieth Century, studied at Hamburg in 1934 and Paris in 1936; and Prof. QIAN Sanqiang, a leading Chinese nuclear physicist, studied under Frédéric Joliot and Irène Joliot-Curie in the late 1930s and the 1940s. Actually, the late Premier Zhou Enlai and Vice-Premier DENG Xiaoping of the People's Republic of China spent time in both France and Germany in the 1920s.

One important potential area of cooperation is in the patenting process. While reciprocal recognition by the EU and China is a rather distant goal, it is possible to facilitate the patent application process by the nationals of both the EU and China in each other. We can begin with each side accepting the final working papers submitted for the domestic (and within EU) registration (after appropriate translation, of course). This can greatly accelerate the patenting process for both EU and Chinese nationals. It will also make it unnecessary for Chinese discoverers and inventors to apply for patents separately in each member state of the EU.

Prevention of climate change (and decarbonization) is another promising area for deep collaboration. Both the EU and China are committed to the full implementation of the Paris Agreement. The EU can share with China its extensive experience on carbon trading, which China is in the process of adopting, and the carbon tax, which China has not yet adopted. The EU and China can also jointly conduct and/or support research on nuclear power, including fusion power, new battery technology, the promotion of the use of heat pumps (of which the EU is the leader), lowering the cost of long-distance transmission of electricity, and the phasing out of coal and the possibility of its alternative use. The EU and China can also cooperate and collaborate in the setting of standards for electric cars and for self-driving cars as there are already calls for phasing out the internal combustion engine in both the EU and China by 2040. They can also cooperate and collaborate in the setting of technical standards for the 5G system of telecommunication. Finally, there is also room for cooperation and collaboration in green financing through agreeing the standardization of the terms and conditions of long-term (possibly as long as fifty years or more) social financing that will encourage efficient substitution by capital costs for operating costs so as to realize the goal of reduction of carbon emission.

High-speed railroads is an example of successful industrial collaboration between German and Chinese enterprises (Siemens<sup>2</sup> and China Railway Rolling-Stock Corporation (CRRC)) which has proved to be very beneficial for both sides. There is now a growing market for high-speed railroads in the rest of the world. Cooperation and collaboration in the design and manufacture of commercial aircrafts is another possibility, especially with China's huge demand over the next few decades. Airbus already has established assembly plants in China. There is also a great deal of room for cooperation and collaboration between the initiatives of Made in China 2025 and Industry 4.0.

Other possible initiatives for cooperation and collaboration include the listing of the shares of EU enterprises on the Shanghai Stock Exchange (on say, an International Board in the form of Chinese Depositary Receipts (CDR)) and those of Chinese enterprises on European stock exchanges as a secondary listing. The goal is to try to create joint EU-Chinese enterprises that are similar to Royal Dutch Shell and Unilever, that are owned by the citizens of more than one country. That will make it less important to focus on the national ownership of individual enterprises. China can also

---

<sup>2</sup> Siemens has since been merged with Alstom, a French train maker, to become Siemens Alstom.

make it easier for the successful European SMEs, of which there are many, to share in the growth of her domestic market.

Finally, an urgent area of cooperation and collaboration between the EU and China is in the field of cyber-security.