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Chinese investment trends in Europe

Report 2018

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Foreword

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Under the presidency of Donald Trump, the United States has taken a step backwards as a leader of nations and a defender of economic and commercial globalisation, leaving a large gap on the world's geopolitical chessboard. Doubtlessly, no country is better prepared than China to fill this gap, since it is the second largest economy in the world (or the first in terms of purchasing power parity). Furthermore, the current Chinese President Xi Jinping, who has been elevated to the level of authority of Mao at the 19th Communist Party Congress, appears determined that his country should play a leading role through the launch of a series of economic initiatives of unquestionable importance and global scope.

Of these initiatives, two stand out: One Belt, One Road (OBOR), a megaproject that aims to develop infrastructure in a group of countries that account for 55% of the world's GDP; and the Asian Infrastructure Investment Bank (AIIB), the Chinese alternative to the status quo of Bretton Woods, which has already attracted a total of 57 countries as founding partners. Other economic initiatives of lesser scope, but of note nonetheless, include plans to promote greater use of the yuan in the international monetary system, and to continue acting as a last-ditch lender in various developing countries.

In this context, state-owned and private Chinese companies continue to extend their presence around the world, increase their investment in various geographical regions and expand into new economic sectors. However, the difficulties associated with the change in the Chinese economic model led to an uncontrolled outflow of capital towards the end of 2016, forcing the Chinese government to impose restrictions, at least temporarily. This led to a slowdown in Chinese investment worldwide in 2017.

These dynamics are captured in the snapshot of Chinese investment in Europe presented in this report. In 2016, these investments hit a new record of USD 41.15 billion (€37.17 billion), up 31% on the previous year. Meanwhile, China maintained the patterns of investment announced in the last few years, consisting in a larger number of operations in sectors related with high-tech manufacturing and services. In 2017, however, the fall in Chinese investments abroad also affected Europe.

Furthermore, in the heart of the Old Continent, protectionist stances that aim to prevent technology firms from slipping into the hands of foreign companies have become more widespread. These stances have led to a proposal from the European Commission that it should have greater powers to block foreign investment. Although the proposal has created greater uncertainty regarding Chinese investment in Europe, it is to be hoped that the mutual benefit to be gained will prevail, and that the volume of investment will recover in the next few years.

The fourth edition of the ESADE China Europe report, now acknowledged as a benchmark study of Chinese investment in Europe, is divided into two main parts. Part I, of a more general nature, analyses the current state of the Chinese economy, in the throes of a change of model that is not without its risks, most importantly a high level of public debt. This part also contains in-depth analysis of two considerations that are key to understanding the China of today and tomorrow: the role of the Asian country as a leader of globalisation, and how it has developed with regard to its technological and innovative capabilities.

In Part II, analysis is made of Chinese investment in Europe, drawing on the ESADE China Europe database. The trends observed point to investment with an increasing focus on technology and a particular interest in the major European economies and, to a lesser extent, southern Europe. This second part also explores the potential effects on Europe of the restrictions on capital outflow introduced by the Chinese government in the period 2016-2017. Finally, the report reflects on the implications of the rise in protectionist pressures in the European Union, insofar as they may affect the EU's investment relations with China.

As with previous editions, it gives me great pleasure to present this report, which I am confident will satisfy both readers who are drawn to this fascinating subject for the first time and those who are experts in the Chinese economy and China's relations with Europe. The report is the fruit of a joint effort led by ESADE Business and Law School and ESADEgeo, with the collaboration once again of Catalonia Trade & Investment.

Javier Solana,
Chairman of ESADEgeo

Executive Summary

Executive summary

• For the fifth consecutive year we are publishing this study with the aim of presenting and explaining the principal trends in Chinese investment around the world and particularly in Europe. The main conclusions are set out below.

• China's economic growth has stabilised, and both in 2016 and 2017 the increase in its GDP was between 6.5% and 7%, within the parameters established by the 13th Five-Year Plan (2016-2020). China has achieved a soft rather than a hard landing, while a reconfiguration in the motors of growth is in progress, albeit at a slower speed than desired, leading to a greater emphasis on private consumer spending and the services sector as driving forces of Chinese growth.

• The main risk factor that threatens economic stability continues to be the high level of public debt and the contagious effect this may have on the financial sector. This trend has not been reversed, for in 2016 public debt climbed 26 percentage points to 279% of Chinese GDP. At all events, the Asian country has a number of cushions that reduce the risk associated with this debt: a solid foreign investment position; debt that is local currency-denominated and in the hands of local agents; a large volume of reserves that can give the central bank room for manoeuvre to avoid a financial shock; and the expected external demand resulting from large projects abroad (in particular, the One Belt, One Road initiative).

• After successive reforms and liberalisation measures that aimed to give market forces a freer rein, there have been recent episodes of financial instability that could lead to a reversal of the liberalisation trend. In a context of liberalisation of the capital account, doubts about the sustainability of public debt, the overheating of the real estate market in the large coastal capitals and the possibilities of arbitration led to a large outflow of capital at the end of 2016. As a result, the government has introduced restrictive measures for transactions abroad, which have had a negative effect both on portfolio operations and direct investment.

• In a world geopolitical environment characterised by a return to protectionism, as demonstrated by the stance adopted by the Trump administration, Brexit, and the rise of anti-globalisation parties in Europe, the Chinese government has emerged as one of the staunchest defenders of liberalisation and of opening up trade and the economy. No other country finds itself better placed than China to replace the United States as the driving force of globalisation in the world and to fill the gaps that may be left by the American retreat overseas. At all events, China's domestic market remains highly protected, and publicly owned companies' operations abroad are strongly supported by the State, which compromises China's credibility as a guarantor of globalisation around the world.

• China has taken giant steps to become a technological and innovative powerhouse on a world scale. The government has shown a strong commitment in this area, ratified through the successive plans it has put into action, and it has made innovation the focal point of the 13th Five-Year Plan (2016-2020). Significant progress has been made in R&D expenditure, scientific production and the development of human capital with respect to research and STEM professionals. For their part, large private groups like Alibaba, Huawei, ZTE, Lenovo, Tencent and Xiaomi stand at the forefront of this innovative trend. At all events, there is considerable room for improvement in the Chinese innovation system, insofar as it could focus more on private initiative in the definition of needs and on making it easier for foreign companies to gain access to this innovation system.

• The Asian country has become one of the principal global entrepreneurship hubs, on the strength of factors such as the explosion of private consumer spending and e-commerce; the massive use of smart phones; the capital available for venture capital projects; the size of the domestic market; and the entrepreneurial capacity of the young population. Chinese start-ups attracted USD 31 billion from venture capital funds in 2016, and Didi Chuxing (transport), Xiami (smartphones), Meituan Dianping (e-commerce), Lu.com (fintech), Toutiao (digital media) and DJI Innovations (hardware) are among the most highly valued start-ups in the world market.

• China became the second largest global investor for the first time in 2016, with record investment of USD 170.11 billion according to official Chinese data, and 56 operations worth more than USD 1 billion. However, in order to contain the massive outflow of capital, the government has introduced numerous restrictions explicitly aimed at foreign investment, which mainly affect private groups and transactions in sectors that are non-strategic for the government, such as entertainment and real estate. As a result, there was a fall of 40.9% in global Chinese investment in the period between January and October 2017.

• Economic sectors that operate at the high end of the value chain and which incorporate a strong technological component are making inroads, gaining positions in the domestic market over other industries in decline. A growing number of companies that operate in these sectors are beginning to look for investment opportunities abroad, showing a greater interest in international expansion – both to acquire capabilities and to reach new markets. In this respect, some relevant sectors are electric vehicles, biotechnology and health sciences, robotics and fintech.

1 Science, technology, engineering and mathematics.

• Chinese investments in the European Union hit a new record of USD 41.15 billion (€37.17 billion) in 2016, up 31.1% on the previous year, according to the ESADE China Europe database. The volume reached is triple the average recorded in the period 2010-2015, confirming that European countries are priority destinations for Chinese investors in their expansion process. At all events, the aforementioned restrictions could lead to a slowdown in operations in 2017. In the first half of 2017, China invested USD 15.3 billion (€13.62 billion) in the European Union, and according to estimates made by ESADE China Europe based on operations announced for the second half of the year, it will finish the year with investment of USD 30 billion.

• By countries, Germany was the prime recipient of Chinese investment in Europe in 2016, accounting for 27.4% of the total, while the United Kingdom was the third largest recipient with a share of 25.5%. Both economies combine an attractive business climate for foreign companies with investment opportunities in sectors of great interest for Chinese companies, such as real estate and high-tech manufacturing. The second largest recipient of investment in 2016 was Finland, due to the acquisition of 84% of Supercell Oy (the video game creator) by a group of investors led by Tencent. This operation, valued at USD 8.6 billion, was the largest of all China's transactions in Europe in 2016. In the first half of 2017, both the United Kingdom and Germany, in addition to Italy, were the leading destinations for Chinese investment in Europe, although the transactions were smaller in number and volume.

• Southern European countries (Italy, Spain, Portugal and Greece) are also key recipients of Chinese capital in the Old Continent. The interests of the government and Chinese companies in these four economies are highly diverse, and although 2016 and the first half of 2017 did not see the large transactions of previous years, some important operations were announced. In 2016, Italy received USD 800 million (€720 million), the most notable acquisitions being those of Inter Milan, the jewellery firm Buccellati and the robot toolmaker Gimatic. Spain received a record investment volume of USD 1.88 billion (€1.7 billion), mainly due to the purchase of the services company Urbaser. In Greece, State Grid took a minority stake in the power grid operator ADMIE, and in Portugal, Fosun announced plans for a capital increase in Banco Comercial Português and Hainan Airlines took a stake in the airline TAP. Notably, in the first half of 2017, investment in Italy showed a substantial increase, making this country the prime recipient of Chinese capital, while in Spain one of the largest transactions in Europe was announced: Orient Hontai Capital would take a majority stake in the media firm Imagina.

• Whereas a few years ago technology sectors and companies in Europe attracted scant attention from Chinese investors, now they are key recipients of capital from the Asian country. In 2016, investment in these sectors rose to USD 12.88 billion (€11.63 billion), 31.3% of China's total investment in Europe, and inflow into sectors such as video games and robotics, hitherto unimaginable, is increasingly frequent. The second most important sector for investment was manufactured goods/industry, with 24.7% of the total, followed by services (16.2%), which include tourism, entertainment and the environment. Other more traditional sectors for investment remain attractive, particularly the energy sector and real estate, in which the sovereign wealth funds China Investment Corporation (CIC) and State Administration of Foreign Exchange (SAFE) have strengthened their positions.

• The acquisition of the German company Kuka, one of the North European country's most important Industry 4.0 firms, by the Chinese home appliance manufacturer Midea for €4.5 billion has aroused considerable concern in the European Union. A wave of similar acquisitions of this kind could erode the competitive advantages enjoyed by industry in the Old Continent, and therefore countries such as Germany, France and Italy have put pressure on the European institutions to develop new EU legislation for closer analysis and review of these operations. In September 2017, a first draft regulation was presented by the President of the European Commission, an initiative of great importance which could have a decisive effect on investment relations between China and the European Union in the next few years.

Extended summary

Extended summary

The report is divided into two main parts. In Part I, of a more general nature, the current state of the Chinese economy is analysed. In Part II, analysis is made of Chinese investment worldwide, particularly in Europe, drawing on the ESADE China Europe database. The trends observed point to investment with an increasing focus on technology and a particular interest in the major European economies and, to a lesser extent, southern Europe. Below is a summary of the main conclusions of the sections that make up the report **"Chinese investment trends in Europe 2018"***.

*Full report avalable in Spanish

1. China: consolidation of growth, potential leader of globalisation and new technological powerhouse

In 2016, the Chinese economy recorded GDP of CNY 74.4 billion (USD 11.3 billion), an increase of 6.7% on the previous year, slightly below increases of 6.9% in 2015 and 7.3% in 2014. Despite this being the lowest rate of growth in the last 26 years, the pace of economic activity recorded is very positive news for China. Firstly, because this growth falls within the parameters set by the Government for its 13th Five-Year Plan (2016-2020), which targeted an annual increase of between 6.5% and 7%, so there is clear compliance with the roadmap established. Secondly, because it indicates a controlled decrease in the rate of growth, dispelling fears of China's GDP falling uncontrollably as a result of the imbalances accumulated in recent years. The first six months of 2017 (+6.9%) and the third quarter (+6.8%) have confirmed the new cruising speed of the Chinese economy, reinforcing the argument that it has entered a period of controlled deceleration.

The current context of economic slowdown has opened up a heated debate about the capacity of the Asian economy to grow less, but to achieve better quality of growth. This entails sacrificing a few GDP percentage points in exchange for the construction and consolidation of a growth model that is more sustainable and generates value. It has slowly become clear in the last two years that the sources of growth – principally from a sector-based perspective – are being redefined in an orderly manner, and activities with higher added value are gradually assuming the role of new driving forces of the Chinese economy. The tertiary (services) sector grew 7.8% in 2016 and continued to increase its share of GDP, while the secondary or manufacturing sector showed an increase of 6.1%. Thus the services sector now accounts for 51.6% of GDP, the highest ever percentage, ahead of the secondary sector at 39.8%. At all events, the speed at which this redefinition is taking place appears to have slowed in 2016, indicating that the change of model is losing some momentum. Moreover, in the course of the first six months of 2017, the services sector will have felt the effects of a downturn in the activity of the property market, in addition to a standstill in the financial sector, caused by an environment of greater uncertainty, together with the restrictions and new regulation introduced by the Government.

The progress of the Chinese economy and the stabilisation of its growth continue to be accompanied by increased public debt, the main threat to the sustainability of the Chinese economy in the medium term. China continues to show great dependence on public spending – the principal generator of debt – in order to maintain its growth rate within the limits established in the 13th Five-Year Plan. In 2016, government investment in fixed assets rose 7.9%, marking a new record and proving to be one of the main catalysts of economic activity. Thus China's debt has risen to 279% of GDP, with the addition of 26 percentage points to its debt-to-GDP ratio in 2016 alone. The escalation of debt is fuelling doubts that the Chinese economy will have the capacity to generate alternative motors of growth, and that consumer spending and the services sectors will actually be able to assume this role, which up until now has been played by public spending.

In previous reports we have argued that the Asian country has many factors in its favour which indicate that its current level of debt is manageable and does not pose a genuine threat that may lead to a sudden fall in its GDP. These factors include a solid foreign investment position; debt that is local currency-denominated and in the hands of local agents; a large volume of reserves that gives the central bank room for manoeuvre to avoid a financial shock; and the expected external demand resulting from large projects abroad (such as OBOR) which should absorb much of the surplus installed capacity.

There have been two key debating points with respect to the Chinese economy during 2017: the positioning of China as a country that promotes and defends globalisation in an international context characterised by increased protectionist stances, and the rise of China as a technological power.

Firstly, the Beijing government has raised its voice to make clear its intention of taking on a more significant role in globalisation, and it has reinforced its message in favour of opening up economic borders. In 2017, President Xi Jinping attended the Davos Forum for the first time. At this annual summit, a meeting point for the world's economic and business elite, he gave an enthusiastic speech in support of economic opening and against protectionism. Possibly no other country finds itself better placed than China to replace the United States as the driving force of globalisation in the world and to occupy the gaps that may be left by the American retreat overseas. The Asian country is the world's second largest economy and the first if PPP is applied. In 2016 it contributed 39% to world economic growth, four times more than the United States. Since 2014, China has been the world's largest exporter of goods, and at present its export volume is three times that of Japan and five times that of the UK. Furthermore, from being an almost non-existent foreign investor (34th in the world in the year 2000), in 2015 China became the world's third largest outward investor, behind the United States and Japan, surpassing the milestone of USD 100 billion invested, and in cumulative terms it is the third largest recipient of FDI worldwide. On the other hand, it should not be forgotten that the Beijing government has launched ambitious initiatives such as One Belt, One Road (OBOR) and the new multilateral banks (AIIB and NDB). Therefore, not only is China the country that

has benefited most from globalisation to date, but it has the opportunity to occupy the spaces left by other powers and to develop into the biggest driving force of globalisation in the next few years. At all events, before it can become the leader of globalisation and be widely recognised as such, the Asian country has a long road to travel; it must commit to deep-seated reforms, overdue and complicated to implement, such as opening up its domestic market more to foreign companies and restricting public-funded support for Chinese companies in their operations abroad.

Driven by immense governmental resolve, the Asian country has made enormous progress in R&D expenditure (2.07% of GDP, more than many European countries), scientific production (it leads the field in computer sciences and artificial intelligence) and STEM student numbers (more than 30,000 students are awarded a PhD in science subjects every year). In addition to the frontrunners in innovation, such as Huawei, Lenovo, Tencent and Alibaba, an increasing number of start-ups (such as Didi Chuxing and Metiuan Dianping) are showing rapid growth and enjoying considerable success.

Therefore, today, according to a variety of metrics, China is an innovation powerhouse. Nevertheless, there is much ground to be covered here as well, and considerable improvement is required if the national innovation system is to have a pervasive effect and lead to a qualitative leap in the output scenario. As for China being a technological powerhouse, there can be no doubt that its technological capabilities have increased and its level of innovation is one step ahead in relation to the country's level of economic development. This said, much improvement is required if it is to catch up with the most innovative countries in the world: China is still a long way from becoming a leading innovation centre on a par with Sweden, Switzerland, Germany, the United States, Japan or South Korea. It is true that every year new records for patents are set, but few of these are recognised abroad; China is the country with the highest number of R&D staff, but the ratio of these staff to the total population lags behind the ratios of developed countries; Chinese companies present new products every year, but in many cases the products developed are improved versions – in terms of their functionality or cost – of products that already exist in advanced countries.

This study has identified six aspects closely related with the innovation system that must be improved or reinforced if China is to close the innovation gap and board the Industry 4.0 train: it must give freer rein to private initiative; improve the criteria and standards for granting patents; improve the intellectual property system; energise the business environment; facilitate foreign companies' access to the national innovation system; and increase the presence of smart money in financing innovative companies.

2. China has become the second largest global investor, is committed to high-tech industry and mainly invests in developed markets like those in Europe

Chinese companies and investment groups stepped up their international expansion in 2016, showing great determination to compete globally, acquire technological assets and, through their operations abroad, compensate for a local market characterised by greater uncertainty. Large acquisitions (worth more than USD 1 billion) are increasingly common, with 56 completed in 2016, compared with 34 in 2015. As a result, in 2016 China overtook Japan in terms of FDI volume, and for the first time it became the second largest global investor behind the United States. According to official Chinese data, investment rose to USD 170.11 billion, an increase of 44% on the previous year, while UNCTAD indicated a figure of USD 183 billion.

However, after Chinese companies' record-breaking foreign investment activities in 2016, restrictions on capital outflow introduced by the government at the end of that year, together with other factors, had a negative effect on the number and volume of operations in 2017. In the first six months of 2017, there was a significant drop in investment operations considered to be "irrational", i.e. outside the framework of the strategic lines of the government. In particular, there was a significant decrease in operations in the entertainment, sport and real estate sectors, some of the sectors most favoured by Chinese companies in the last two years, and this mainly affected the international activity of private groups. As a consequence of this, the number of M&A in the first six months of 2017 fell 20% compared with the same period of the previous year, and whereas average monthly investment totalled USD 15 billion in 2016, between January and June 2017 it dropped to just USD 8 billion a month. This fall was confirmed by the Chinese government itself through figures published by MOFCOM, which indicated a decrease in investment volume of 40.9% in the first ten months of 2017 compared with the same period of 2016.

Although the number of large operations fell in the first half of 2017, there were some important foreign acquisitions made by Chinese companies which are worthy of mention. These include the largest ever acquisition made to date, that of the Swiss seed firm Syngenta by state-owned ChemChina (China National Chemical Corp) for USD 43 billion, thereby creating a new giant in the chemical sector (to compete with the Dupont and Chemical and Bayer and Monsanto mergers). NHA acquired the American aircraft leasing company CIT Group Inc for USD 10.38 billion. Tencent, the owner of WeChat, purchased a stake in the US firm Tesla for USD 1.78 billion, giving the Chinese group a 5% share in the electric car company. Key transactions were also made in more traditional sectors, such as mining (Yankuang taking over the Australian company Rio Tinto), infrastructure (connection of infrastructure with Laos undertaken by China Railway Corp.) and real estate (NHA acquiring the 245 Park Avenue building in New York).

The most important occurrence concerning Chinese foreign investment in 2017 was the downturn in operations after several years of consecutive growth. This is a direct consequence of the set of restrictive measures announced by the government, principally with a view to containing the chaotic and massive outflow of capital, as well as the doubts raised by the financing and profitability of large operations undertaken by companies such as HNA, Fosun and Dalian Wanda, among others.

The government announced the creation of a list of entrepreneurial activities in which SOEs are not permitted to invest outside China, in addition to the establishment of new requirements for the presentation of formal documents and restrictions in access to financing. At a press conference held in December 2016, the POB, SAFE, MOFCOM and CDCR announced that the government would closely monitor foreign investments in the real estate, hotel, film, entertainment and sport sectors, in addition to acquisitions outside the investor's core business.

Predictably, this package of measures had a negative effect on the volume and number of outbound investments in several ways. There were direct repercussions as a result of tighter regulatory restrictions on high-volume foreign transactions in sectors where links with the objectives of the Chinese government were weaker. Indirectly, some investments in progress could be affected, both those that have been announced and those in which transactions are due to take place in stages and have yet to be completed. In the same way, the measures could also affect reinvestments, where transactions are made via loans between companies in the same group or transfers from the parent company to subsidiaries abroad.

It is thought that these restrictive measures will be eased in the medium term. The government's objective is that Chinese FDI should reach USD 750 billion in the next 5 years, which would average out at USD 150 billion a year. Moreover, there appears to be a contradiction here with the government's foreign investment objectives for the development of infrastructure planned as part of the One Belt One Road (OBOR) programme on the one hand, and stringent restrictions on capital outflow in force on the other.

High-tech sectors are and will be priority recipients of Chinese foreign investment

In a context of growing interest in investing in the services sector abroad, ESADE China Europe foresees that in the next few years Chinese FDI will increase in four high-tech sectors: electric vehicles; biotechnology and health sciences; robotics; and the fintech industry.

Turning first to electric vehicles, their progressive introduction into the day-to-day lives of families is a national priority for China and one of the main sources of hope for halting the galloping increase in pollution in urban areas. At present, all the major vehicle manufacturers are developing or launching new electric models or hybrids: Geely has the Emgrand EV model; BAIC, the EC180; Chery, the Arrizo 7 PHEV; and BYD, the e6. Despite the ground that has been gained by electric vehicles, Chinese companies are mainly focusing their efforts on the manufacture of simple models at an economic price. Nevertheless, there is clearly room for the development of more sophisticated electric vehicles with higher specifications. This is why numerous transactions have already taken place abroad. At the beginning of 2017, the technology giant Tencent acquired 5% of the US manufacturer Tesla for USD 1.78 billion. Mention should also be made of Faraday Future, which is planning the production of a vehicle to compete with Tesla, to be developed in the United States; the Chinese Wanxiang Group, which is preparing to produce up to 50,000 electric vehicles a year in a new factory on the West Coast, having bought the assets of the manufacturer Fisker Automotive; and Lucid Motors, mainly supported by a group of Chinese investors, which also has its headquarters in California, in Menlo Park.

The second key sector is the biotechnology and health sciences sector. Chinese investors' interest in pursuing transactions in this sector is motivated by the need to find new growth areas and high-quality products – beyond the local generic products market which is saturated – and to acquire or take a stakeholding in foreign companies whose products comply with international standards. In this way, these investors can gain entry to markets that are not always accessible for products from China. The strategy of Chinese companies is to invest in firms in advanced countries, whereby they can gain access both to assets that will complement their product portfolio and to new markets. Consequently, biotechnology and health sciences companies are currently among the most active when it comes to investing abroad. Operations completed in 2016 and 2017 include the stake taken by the biotechnology branch of the private conglomerate Fosun (China's Shanghai Fosun Pharmaceuticals) in Hyderabad, India-based Gland Pharma; the takeover of the Australian group GenesisCare, which specialises in cancer treatment, by China Resources, in consortium with the Mcquaire fund; Luye Pharma Group's acquisition of the transdermal drug delivery systems (TDS) business from the Swiss firm Acino; and Chemchina's purchase of the Swiss multinational seed treatment specialist Syngenta

With respect to the robotics industry, China is already a key player in this sector, since it has been the biggest purchaser of industrial robots since 2013 and the largest operator since 2016; however, the scope for introducing more robots in the Asian country is enormous, since there are only 36 robots for every 10,000 workers, well behind Germany (292) and Japan (314). Chinese companies can develop a large number of robots specialising in certain technologies, but not in all technologies. For example, technologies associated with robot controllers or decelerators are mainly found in companies in advanced countries. It is therefore important to increase foreign investment, particularly through the acquisition of companies with a high technological content in countries with a high degree of industrial development. The most important foreign investment made to date in the robotics sector has been Midea's purchase of the German firm Kuka for USD 2.88

billion. Indeed, this was one of the most important acquisitions to be completed in Europe in 2016. That year, the same group, Midea, also purchased the Israeli company Servotronix, which specialises in automation solutions applicable to a large number of industries. The AGIC Capital fund, together with state-owned enterprise ChemChina and state-owned fund Guoxin International, spent USD 1 billion on the purchase of the German KraussMaffei Group, which produces industrial robots for military applications. And the Chinese Wanfeng Technology Group acquired the Michigan, US-based robot welding specialist Paslin.

China is already the global leader in the fintech industry, driven by the boom in e-commerce, the high penetration of smartphones among the population, the thousands of SMEs anxious to obtain funding, and the availability of capital and talent to set up new technology-based entrepreneurial projects applied to the financial industry. Aware of the strength of this sector and the great opportunities it currently offers, the major technology companies, such as Tencent, Baidu and Alibaba, have their fintech companies, namely Tenpay, Baidu Financial and Ant Financial, respectively. Furthermore, other financial services platforms have emerged which are enjoying great success, such as Lu.com (wealth management), Qufenqi (payment platform for students and professionals), ZhongAn (insurance platform) and Wecash (credit assessment). With their considerable resources and technological capacity, Chinese fintechs have begun to internationalise, in order to facilitate international transactions in and out of China and to reduce their dependence on the domestic market. Ant Financial, valued at USD 60 billion, has already invested in the Thai digital payment platform Ascend Money, and it has declared its interest in acquiring the US fintech MoneyGram International. Ant Financial also purchased 40% of the Indian company Paytm, the largest commercial payments platform in India, giving it access to 122 million users and a licence to offer its services in this country. Baidu Wallet, Baidu's payment platform, has expanded into various markets in South East Asia, beginning with Thailand, and it has announced its intention to continue expanding into the markets of South Korea and Japan. For its part, Lufax, the largest P2P lending platform in China, owned by the giant Ping An Insurance, aims to set up a platform so that Chinese investors can place their assets abroad, and it is preparing its IPO in Hong Kong to support its expansion into the international market.

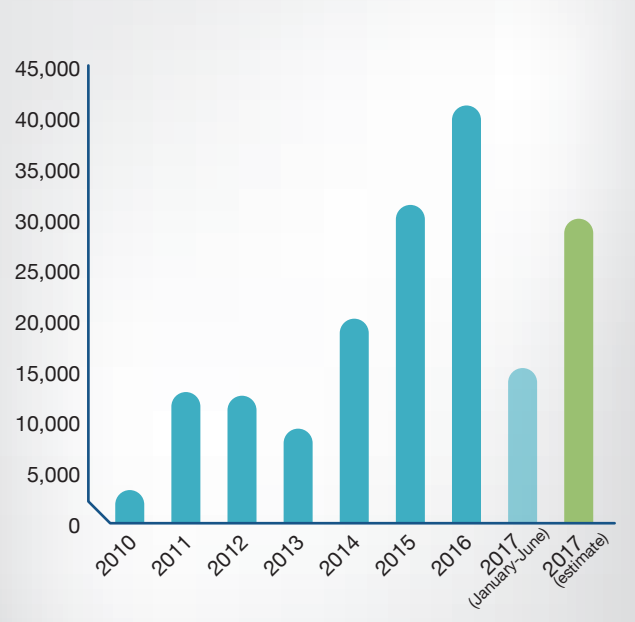
3. Chinese investments in Europe home in on technology, advanced manufacturing and services

Office buildings in London, wineries in Bordeaux, football clubs in the top Italian and Spanish leagues, banks in Portugal, robot companies in Germany and video game companies in Finland. Today, no sector in Europe fails to attract the interest of Chinese investors, who find in this continent all the assets they need in their thirst for leadership and international growth.

Chinese investments in the European Union hit a new record of USD 41.15 billion (€37.17 billion) in 2016, up 31.1% on the previous year, according to the ESADE China Europe database (see Chart 1). This figure triples the average figure for the first five years of the decade (2010-2015) and is largely due to a succession of major entrepreneurial acquisitions.

As has occurred in the rest of the world, restrictions on Chinese companies' foreign investment have had a negative impact on the number and volume of operations in the EU; as a result, official year-end data for 2017 could show a decrease after three years of consecutive growth. Between January and June 2017, China invested USD 15.3 billion (€13.62 million) in the EU, according to the ESADE China Europe database. Important operations were announced for the second half of 2017. Taking these into account, Chinese investment in Europe should reach approximately USD 30 billion (€26.74 billion) by 2017 year-end.

Chart 1 Chinese investment in the European Union (2010-2017)



Source: Own research

The countries that received the highest volume of investment in 2016 were Germany, Finland and the United Kingdom (see Chart 2). Germany is the European country that enjoys the most successful business relationship with China in terms of both quantity and quality, and Chancellor Angela Merkel travels more frequently to the Asian country than any other European leader. When it looks at Germany, China sees the industrial power it would like to be, and the German model of development and the European country's capacity to integrate technology into industry serve as inspiration for the Chinese government today. In 2016, Germany was the prime destination for Chinese investment, receiving USD 11.26 billion (€10.17 billion), 27.4% of China's total FDI in the EU. The most controversial of all the operations undertaken by China in Europe to date has been the acquisition of the robot manufacturer Kuka by Midea Group for USD 3.98 billion (€3.6 billion).

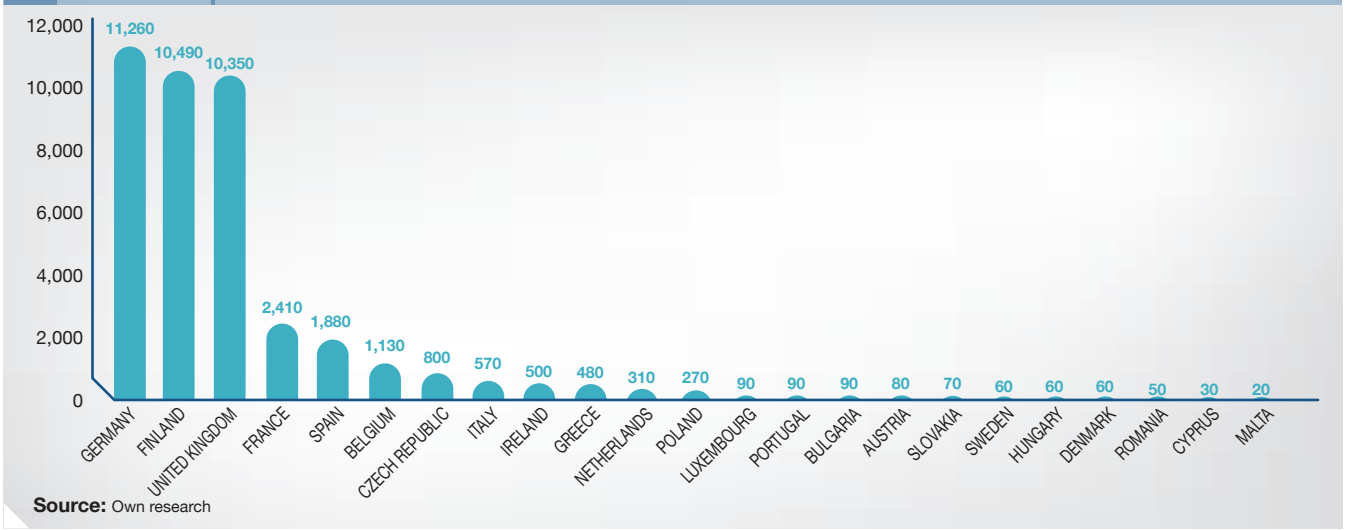
Finland was the second largest recipient of Chinese investment, mainly on the strength of one single transaction: the acquisition of 84% of Supercell Oy, the creator of video games such as Clash of Clans and Clash Royale for mobile devices, by a group of investors led by Tencent (Clash of Clans generates €750,000 a day in download revenue and is one of the most sought after games by iPhone users). The transaction, valued at USD 8.6 billion (€7.77 billion), responds to Tencent's growing need to generate competitive advantages in the domestic entertainment content market over its two big rivals, Alibaba and Baidu. The operation is a clear example of the increasingly common logic behind Chinese investments in Europe: acquisition abroad of a knowledge intensive company with a view to generating a differential value for the Chinese market. It also marks a new milestone, showing just how far purely technological companies are prepared to go in their race to acquire capabilities.

The United Kingdom combines a highly attractive entrepreneurial environment for business with an Anglo-Saxon regulation model, extremely open and stable, and then it has London, one of the most important financial centres in the world. This country also offers the possibility of making large, long-term investments in low-risk assets with stable profitability, such as real estate and ownership interests in infrastructure. It would not appear that Chinese companies' decision-making has been affected by the Brexit process, activated as a result of the popular referendum of 23 June 2016. Indeed, investments totalling USD 10.35 billion (€9.35 billion) were announced, representing 25.2% of China's total FDI in Europe.

In France, two large-scale operations accounted for 70% of China's investment in this country, which as the fourth largest European recipient saw an inflow of USD 2.41 billion (€2.18 billion) in 2016, 5.9% of China's total FDI in this continent. Shandong Ruyia, the Chinese textile and accessories specialist, closed the purchase of the French fashion conglomerate SMCP, which controls the Sandro, Maje and Claudie Pierlot brands, for USD 1.64 billion (€1.48 billion). The previous owner of SMCP was the venture capital firm KKR. The other operation of note involved the hotel group Jinjiang International, part of the public holding Jinjiang International Company, which paid USD 500 million (€450 million) to become the largest single shareholder (12.5% of shares) in Europe's largest hotel operator, the Paris-based group AccorHotels (which employs former president Sarkozy as an international expansion consultant).

The Southern European countries Spain, Italy, Greece and Portugal also received sizeable investments in 2016. Spain was the fifth largest recipient of Chinese investment, receiving a record volume of USD 1.88 billion (€1.7 billion), mainly as a result of the purchase of the services company Urbaser. Spe-

Chart 2 Chinese investment in the European Union. Geographical distribution (2016)



Source: Own research

cialising in the environment and owned by the construction company ACS, Urbaser was acquired by Firion Investment, which is controlled by the Chinese Energy Conservation and Environmental Protection group (Cecep). Other key operations include the sale of Repsol's offshore wind power business in the United Kingdom to SDIC Power, and the sale of the Galician canning company Hijos de Carlos Albo to Shanghai Kaichuang Marine International. One of the largest investment operations announced for the second half of 2017 in Europe involves the Spanish media group Imagina, 53% of which will be acquired by the Chinese investment fund Orient Capital. At USD 940 million (€850 million), this will be the second largest of China's transactions in Spain to date.

Italy received investment worth USD 800 million (€720 million). The most important acquisitions of Italian firms were the following: Inter Milan was purchased by the home appliance chain Suning, and one year later in 2017 its great rival AC Milan was also sold to Chinese investors. The jewellery firm Buccellati was acquired by the conglomerate Gangsu Gangtai in the latest incursion by a Chinese investor into the European luxury market, and the Euro-Asian private equity fund AGIC purchased the Brescia-based manufactured goods and components firm Gimatic. Furthermore, China has made a second large investment in public assets in Greece. Following COSCO's majority stake in the Port of Piraeus, a minority stake in the Greek power grid operator ADMIE was taken by the Chinese state-owned utility operator State Grid, the largest utility company in the world. In 2016, Portugal did not receive Chinese capital on the scale of previous years, although there were some notable transactions. Fosun announced plans for a capital increase in the Banco Comercial Português (BCP) to fulfil its aim of taking a 30% stake in the Portuguese bank. In another key operation, Hainan Airlines targeted the capital of the airline TAP, taking the 23% shareholding in the Portuguese airline previously held by the Brazilian low-cost airline Azul.

In the first six months of 2017, Italy, the United Kingdom and Germany were the main focus of Chinese investment in Europe, against a background of fewer operations and less money changing hands. Key operations in this period included the acquisition by the Chinese consortium formed by JCA Capital and Wise Road of the Dutch semiconductor firm NXP, created from a Philips subsidiary; the share taken by China Energy Company Limited (CEFC) in the Czech financial group J&T Finance, which is strongly focused on the markets of Eastern Europe and Russia; Dalian Wanda's acquisition of the Swedish cinema chain Nordic Cinema, following key purchases of cinemas in the United States and the United Kingdom; and the aforementioned sale of the Italian football club AC Milan to a consortium of Chinese funds after three months of negotiations.

Although operations were not on the scale of previous years, there were transactions of note worth more than USD 1 billion. Some of the most important operations were announced in the sectors of biotechnology (Creat's purchase of German plasma specialist Biotest), video games and applications (a Chinese consortium's takeover of Outfit 7, the Slovenian firm that developed the video game Talking Tom), entertainment (Wanda's purchase of the Swedish cinema chain Nordic Cinema) and finance (NHA increasing its share in the German financial institution Deutsche Bank). Mention should also be made of China Investment Corporation (CIC) acquiring the British company Logicor, previously held by Blackstone, for USD 13.46 billion (€12 billion), an operation that represented the first major entry into the European logistics sector by the sovereign wealth fund; the possible award of the tender for electricity distribution in Finland valued at USD 3.6 billion (€3.2 billion) to China Southern Power Grid Co. and China Yangze Co.; and the Chinese airline China Eastern's purchase of 10% of the Dutch airline KLM, another major operation involving a large European airline, preceded by Hainan Airlines' decision to take a share in the Portuguese airline TAP.

Increasingly so, Chinese investment in Europa is essentially investment in technology, reflecting the change in the needs of an economy in transformation. Within this change, innovation lies at the heart of everything and is a priority for both authorities and entrepreneurs. Large companies invest in Europe in order to incorporate new capabilities into sectors such as video games and robotics, something that would have been unthinkable a few years ago. According to the ESADE China Europe database, the sector that attracted the highest inflow of Chinese capital into Europe in 2016 was technology, with more than 12.88 billion (€11.63 billion) invested, 31.3% of China's total investment, mainly through purchase or equity transactions. The volume of investment was largely concentrated on the aforementioned operation with Supercell in the video games for smartphones subsector, but in addition to this, 30 other transactions were completed in the technology arena. Notably, in an environment in which Chinese companies invest outside their main activity, several operations were completed by technological outsiders seeking to diversify their investment model and jump on the future industries bandwagon. An excellent example here can be seen in the decision of the food (particularly chicken) distributor Fujian Sumpo Foods Holdings to purchase the British studio Splash Damage (the developer of games such as Enemy Territory, Brink and Doom III). The Chinese giant, which supplies meat to KFC, proceeded to change its name to Leyou Technologies. Prior to Splash Damage, it had already engaged in other transactions in the video games and entertainment sector. Another similar operation was the acquisition by China's Cultural Investment Holdings, a specialist in automotive components, construction materials and e-commerce, of the British visual effects company Framestore, which has worked for various Hollywood productions, including the Oscar Award-winning Gravity.

The European manufacturing sector, composed of some 2 million companies (which employ 33 million people), is currently undergoing a process of reorganisation and transformation towards digitisation and the incorporation of new technologies such as the internet of things, big data and 3D printing. The firms leading this race, such as the German Kuka referred to earlier, are the prime targets of Chinese companies. Following a model that on paper offers a clear win-win, the European companies look for investors that will help them gain access to the complex Chinese market, and in other ca-

ses take on their debt or alleviate a difficult financial situation. The manufacturing sector was the second highest recipient of Chinese investment in 2016, with inflow of USD 10.16 billion (€9.18 billion), 24.7% of total Chinese FDI. Besides Kuka, other transactions of note, all involving German companies, included ChemChina's purchase of KraussMaffei and Shanghai Electric's acquisition of the aeronautical equipment manufacturing group TEC4AERO.

In 2016, the European services sector proved to be the third most attractive sector for Chinese capital, receiving USD 6.68 billion (€6.03 billion), 16.2% of China's total FDI. Chinese companies seek to leverage advantages through their purchases abroad in various branches of the services sector in which business is booming in the Asian country: tourism and travel, cinema, sport and the environment. The largest operation took place in the field of tourism and travel: the acquisition of the British flight search engine and unicorn Skyscanner (which has 60 million active users) by the Chinese travel company Ctrip for USD 1.75 billion (€1.58 billion). In the cinema and entertainment subsector, the Dalian Wanda group – through its American company AMC Entertainment – purchased the British cinema owner and operator Odeon & Uci Cinemas for USD 1.21 billion (€1.09 billion), creating a global giant in the sector with a total of 7,600 cinemas. Turning to sport, one of the oldest football clubs in Europe, Inter Milan (with 108 years of history), was acquired by the home appliance firm Suning for USD 310 million (previously, AC Milan, Olympique de Lyon, Atlético de Madrid, Español and Slavia Prague had all received Chinese investments). In the environment and waste treatment subsector, the Spanish construction company ACS sold Urbaser, its waste treatment subsidiary, to Firion Investments for USD 1.57 billion (€1.42 billion).

Chinese capital has a growing appetite for technological assets, manufactured goods and service activities, but operations in other more traditional sectors such as energy and real estate show that more conservative investments have not lost their importance. The energy sector received USD 6.51 billion (€5.88 billion) in Chinese investment (15.8% of the Asian country's total investment), and it was a sovereign wealth fund that already has an investment position in Europe, CIC, which made the largest investment, taking a stake in National Grid's gas division in the United Kingdom, in which, a priori, it will be a passive shareholder. Furthermore, the growing demand to incorporate and develop solutions that help to mitigate the effects of climatic deterioration – one of the objectives of the 13th Five-Year Plan – is encouraging Chinese companies to take over European companies with capabilities and knowledge in renewable energies. Thus, last year, the German company Energy from Waste, which specialises in energy from waste solutions, was purchased by the stock exchange-listed Beijing Enterprises (USD 1.61 billion); and China's giant corporation Three Gorges acquired a majority interest in the WindMW offshore wind farm, owned by Meerwind and one of the biggest in Germany (USD 1.54 billion). Three Gorges was already present in Europe through its stake in Energias de Portugal (EDP).

With respect to the real estate sector, both companies and citizens in China showed great interest in the purchase of housing in 2016, a year in which China invested USD 33 billion (€29.83 billion) in residential and commercial properties abroad. Purchases by private individuals are complicated to trace and estimate, but investments made by investors of renown or investments that have affected European properties have aroused great expectation. For example, in recent years the sovereign wealth fund and foreign exchange reserves manager State Administration of Foreign Exchange (SAFE) has purchased four office blocks in the centre of London; Jian Jing has bought the Paris-based Louvre Hotels Group; the private group Fosun has acquired the Palazzo Broggi in Milan; and the Wanda group has bought the Edificio España building in Madrid, although in this last case the property was sold at the beginning of 2017. This trend was maintained in 2016 with more than ten operations in the European real estate sector, the most notable of these being CIC's acquisition of the BGP apartments in Berlin and North Rhine-Westphalia; Jin Jiang Hotels' purchase of the French hotel group Accord; and the private conglomerate CEFC's acquisition of an office block in Prague.

The rise of protectionism in the EU and its implications

In 2016 and 2017, a new variable has to be taken into consideration when analysing Chinese investment in Europe: the rise of protectionism in the Old Continent. In the last few years, the major European economies have been witness to growing popular support for protectionist parties. It is in the United Kingdom where this anti-European movement has been most evident, following the victory of the Leave campaign in the binding referendum on the EU called by ex-prime minister David Cameron on 23 June 2016. Of greater concern are the tensions in the Franco-German axis; this axis forms the backbone of the European project, it played a vital role in shaping the structure of the EU when it was founded, and the stability and the maintenance of the Eurozone is dependent on its support. In the French presidential elections of May 2017, in spite of the victory of the pro-European liberal Emmanuel Macron, the National Front led by Marie Le Pen reached the second round for the first time and was the second favourite candidate to occupy the Élysée Palace. In Germany, despite the victory of Angela Merkel, the far-right Alternative for Germany party entered parliament for the first time as the third force in German politics and was the second most voted party in East Germany.

Protectionism in the EU has increased considerably, as demonstrated by the growing popular support for greater economic and commercial protectionism. The objectives of this protectionist current include controlling foreign companies' acquisitions of local assets, above all in advanced manufacturing sectors, since these companies are threatening the survival of traditional sectors and the jobs they provide.

In this respect, in their race to become global leaders in their sectors of activity, large Chinese companies, both public and private, need to increase their technological capabilities. In addition to the ambitious measures introduced by the government in the domestic arena, if Chinese companies are to make a qualitative leap, they must acquire these capabilities abroad, principally through a takeover or by purchasing a shareholding. And to fulfil this objective, Chinese firms have a favourite destination: the EU. The Old Continent offers them a great many medium and large-sized companies which enjoy a strong competitive position and a high degree of specialisation based on the development and implementation of technology.

To date, there has been one particular operation that has set institutional and political alarm bells ringing: a Chinese investor's acquisition in 2016 of the German company Kuka, a highly innovative firm specialising in automation and robotic solutions. China's Midea Group, the largest home appliance manufacturer in the Asian country, purchased the German firm for €4.5 billion, an offer which Kuka was grateful to receive, since this gave it the opportunity to enter the Chinese market, enormous in size and with a low level of automation. The purchase aroused considerable concern among the German political elite, particularly because Kuka was one of the key companies in "Industrie 4.0", a plan for the large-scale digitisation of German industry aimed at increasing the country's competitiveness.

Kuka has not been the only case which threatens to erode the technological superiority of German industry through the sale of the European nation's companies to the emerging superpower. Another relevant example due to the size of the operation was Beijing ChemChina's acquisition of the machinery manufacturer KraussMaffei Group (€925 million). A further operation that took place in 2016 was the purchase of the energy from waste company EEW by Beijing Enterprises (€1.4 billion). One operation that was not completed was the purchase of the semiconductor firm Aixtron by Fujian Grand Chip. In this case, the transaction was blocked due to possible repercussions with regard to nuclear security and the Chinese group's relations with the government. At all events, it will come as no surprise if these episodes are repeated, given that Chinese companies see Germany as a key hunting ground in Europe in their quest to gain access to technological assets.

Although it has been through the acquisition of Kuka that Chinese investments have begun to attract the attention of public opinion and the European political agenda, operations involving "sensitive" assets, such as infrastructure, have been taking place for some years. A clear example is the announcement that China General Nuclear Corporation (CGN) will take a 33.5% stake in Hinkley Point, in which the remaining 66.5% corresponds to Electricité de France (EDF). It is planned to construct a new reactor on this site in Somerset, in the South West of England. Together with China Nuclear National Corporation (CNNC) and the French utility company Electricité de France, CGN develops nuclear plants in China. Chinese investors have purchased or invested in airports, such as Frankfurt-Hahn in Germany (Shanghai Yiqian Trading), Toulouse Blagnac in France (Shandong Hi-speed Group) and Manchester City Airport in the United Kingdom (Beijing Construction Engineering Group, greenfield project); in ports, such as Piraeus in Greece (COSCO) and Barcelona in Spain (Hutchinson); and in service provision, for example the sovereign wealth fund CIC's 9% stake in the London water services supplier Thames Water. These operations serve either as logistical investments for extending capacity and control of commercial routes from China to Europe or as passive investments in long-term assets with lower profitability. Therefore, since they are not directly related with the acquisition of technology and they do not impinge on sensitive sectors such as nuclear energy, they have not aroused very much concern in European governments and EU institutions.

The EU, due to its high degree of fragmentation and limited competences, does not have instruments that can block investment operations, as the United States has, for example. It is the member states that have their own systems for reviewing and controlling foreign investments, although they apply EU regulations as they do this, with a margin of interpretation and application that allows control mechanisms to be established. In this context, at the beginning of 2017, the three major economies in the Eurozone, Germany, France and Italy, submitted a letter asking the EU institutions to put some mechanisms into action that would allow the right to veto purchases of companies by foreign investors that represent a threat to the competitive position of European industry.

As a result of all this, in September 2017 the president of the European Commission announced the creation of a system to monitor foreign investments in Europe, particularly in the infrastructure, defence, energy and technology sectors. In the words of Juncker himself: "…This is why today we are proposing a new EU framework for investment screening. If a foreign, state-owned company wants to purchase a European harbour, part of our energy infrastructure or a defence technology firm, this should only happen in transparency, with scrutiny and debate". To date, this is a non-definitive draft regulation that has yet to be approved by the European Parliament or the Council. The ultimate decision to approve investments will continue to rest with the member states, and the EU will have powers i) to analyse investments that may affect their programmes (such as the research programmes within the framework of Horizon 2020 or the space programmes under the Galileo initiative); ii) to create a cooperation mechanism for analysis of investments between the EU and member states; iii) to set up a framework of action for the analysis of operations that may not comply with standards of transparency and the criteria established by the Commission.

Advanced manufacturing in Catalonia: a present and future opportunity for Chinese investment

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Today, the world is spinning faster than ever. The changes currently taking place in the production model are totally different from those that have taken place in the course of history. They are major changes to which countries must adapt in order to maintain or improve their competitive position in an increasingly globalised environment.

One of the countries that has taken most advantage of the opportunities offered by this new reality is China. As this report notes, China is leading globalisation while establishing a position worldwide as a technological and industrial powerhouse. It seeks to extend its leading role in the future through its "One Belt, One Road" initiative, which aims to foster economic, technological and commercial cooperation with countries in many parts of the world, and its "Made in China 2025" programme, designed to upgrade Chinese industry and lead it towards advanced manufacturing or Industry 4.0.

Catalonia is also taking advantage of the opportunities of globalisation: it is an economy open to foreign trade (international trade of goods and services represents 70% of Catalonia's GDP)[1], with an extremely solid, innovative industrial base. This is a region with an excellent geostrategic position as a gateway into Europe and a bridge between Asia and Latin America. Furthermore, it is one of the European regions that is making a particularly strong commitment to advanced manufacturing, shining in fields such as 3D printing, among others.

Aspects such as these are covered in this article, which offers a panoramic view of Catalan industry and its process of transformation, outlining the principal assets of Catalonia's innovation ecosystem which are paving the way towards Industry 4.0. The article also highlights some significant cases of companies – especially Chinese companies – which have already chosen Catalonia as a destination for investments in advanced manufacturing, and it refers to various tools at the service of the investor.

Catalonia. An industrial driving force in transformation

Catalonia is one of Europe's strongest industrial driving forces. Industry's contribution to GDP is as high as 20%[2], above the European average and meeting the objective set by the EU for the year 2020. In spite of this good position, the objective is to reach 25%, and to do so it will be necessary to make a commitment to advanced manufacturing, the main focus of Catalonia's industrial policy.

Catalan industry has a clear capacity to compete globally. Export records have been beaten in the last six years, while high tech exports have increased considerably over the last four years. Catalan industry is also highly diversified (no sector accounts for more than 15% of the industrial GVA)[3], with industries that stand out on account of their strength and their degree of technology, such as food, chemicals, and the automotive and pharmaceutical industries.

Diversification and the presence of very complete value chains offer great opportunities in many sectors and in all parts of the chain. Thus foreign investors find a dense network of suppliers, partners and customers in Catalonia, as well as an offering of specialised and high added-value services in fields such as R&D, design, logistics, ICT and shared service centres.

This manufacturing strength is the result of decades of commitment to industry, a commitment which is even stronger today. Catalonia has been a pioneering region in all the industrial revolutions, and it is playing this same role in our present-day revolution, striding confidently and decisively towards Industry 4.0. By way of example, according to the Barometer of Innovation in Catalonia, 22.6% of companies in Catalonia that innovated incorporated digital transformation technologies in 2016, notably Big Data and the Internet of Things[4].

One of the sectors that best illustrates this transformation is the automotive industry. Catalonia continues to be a large producer of the "vehicle of today" and has an integral value chain for its development, which includes car manufacturers, various TIER levels, engineering firms, technology centres, certification centres, etc. While it maintains its leadership in this segment, it is positioning itself as a key player in the production of the "vehicle of the future" – electric, connected and autonomous – with projects such as the Catalonia Living Lab, an initiative undertaken together with the regional government of Catalonia, the automotive industry, the telecommunications industry and agents in the sector.

The Catalonia Living Lab is a unique environment in Europe for testing autonomous and connected vehicles, where companies from all over the world can carry out tests and validations of future car technology. All this takes place on roads and circuits in Catalonia.

[1] Source: Idescat. Degree of opening up of the Catalan economy.
[2] Source: Idescat.
[3] Source: Idescat.
[4] Survey conducted by Catalonia Trade & Investment to measure the tangible and intangible innovation of Catalan companies.

The strength of both the traditional and the future car industry greatly enhances China's investment opportunities in Catalonia. This situation applies to other sectors undergoing a similar process of transformation driven by innovation and digitisation, sectors such as logistics, capital goods and health sciences. As noted in this report, some of these sectors will be leading the growth of Chinese foreign investment over the next few years.

Innovative ecosystem to drive advanced manufacturing

Two important factors reveal the innovative potential of Catalonia: firstly, its high scientific production, generating a little over 1% of world science, ten times more than average for a population of its size; and secondly, the quality of its R&D, as demonstrated by the region's success in raising European R&D funds, granted in competitive tendering processes. Since the start of the Horizon 2020 programme, Catalonia has received 2.72% of the total funds granted, excellent results in view of the fact that Catalonia has 1.5% of the population of the EU[5].

This has been possible because Catalonia has built an innovation ecosystem that is an international benchmark. The key elements of this ecosystem, which drives industrial transformation and opens up investment opportunities in the field of advanced manufacturing, are the following:

* Excellent scientific infrastructures, such as the Barcelona Biomedical Research Park; the Barcelona Supercomputing Centre, home to the Mare Nostrum computer, the fourth most powerful supercomputer in Europe; the ALBA synchrotron; the Institute of Photonic Sciences (ICFO); the Catalan Institute of Nanoscience and Nanotechnology (ICN2); and Idiada, one of the main suppliers of technological and testing services for the automotive sector worldwide.

* Differential industrial technology suppliers such as Eurecat, a large technological hub in Catalonia, which brings together centres of excellence in big data, advanced manufacturing, industrial robotics, water management, textile innovation and plastics processing. Mention should also be made of the entities accredited with the TECNIO seal, awarded to the developers and providers of the most innovative technologies. Thanks to these and other agents, Catalonia is at the cutting edge of fields such as 3D printing in graphene, quantum computing, drones and autonomous and connected car technologies.

* Top international trade fairs and congresses that drive the digital economy, such as the Mobile World Congress, the Smart City Expo & World Congress, the IoT Solutions World Congress and IN(3D)USTRY. All these trade fairs promote digital technologies and open up business opportunities for local entrepreneurs and foreign visitors, among whom there are an increasing number of Asian companies.

* A key position as a start-up hub, placing Barcelona – Catalonia in the top 5 in Europe in various rankings of best cities for emerging companies. The region also accounts for 70% of international venture capital operations closed in Spain in 2016[6].

* Industrial infrastructure for advanced manufacturing, such as the 3D printing hub, promoted by the Catalan regional government and the private sector as a platform for making Catalonia a world benchmark in the field of 3D industrial printing.

* Critical mass of Industry 4.0 products and services, with some 400 companies and agents that offer solutions in this field, most notably technology integrators, according to a mapping and analysis of the advanced manufacturing sector in Catalonia conducted recently by Catalonia Trade & Investment. These companies include world leaders such as HP, Ricoh and ABB.

In summary, Catalonia is consolidating its position as a leading industrial innovation ecosystem in Europe, offering opportunities for high added-value, knowledge-intensive investments with a strong technological component.

Present investments in advanced manufacturing

This mix of opportunities between traditional industry and industry of the future is attractive for foreign investors, who see Catalonia as a region in which they can make their projects grow. Indeed, specialist publications like European Cities and Regions of the Future of the Financial Times Group pinpoint Catalonia as the best destination for investment in Southern Europe.

Asian investors, in general, and Chinese investors, in particular, are aware of these opportunities. According to FDI Global Mapping 2016, compiled by Catalonia Trade & Investment based on data from fDI Markets, Catalonia attracted 51% of the investment projects set up by companies from the Asia-Pacific region in Spain between January 2011 and June 2016. In the case of companies from China, this figure rises to 55%, and in the case of Hong Kong, 91%. In this period, both China and Hong Kong were among the top 10 investors in Catalonia.

[5] Source: Catalonia Trade & Investment based on the CDTI, Eurostat and Idescat. Figures for the period January 2014-October 2017.

[6] Source: Catalonia Trade & Investment based on the Spanish Venture Capital & Private Equity Association (ASCRI).

Among the most recent Chinese investments, cases may be observed of companies that commit to Catalonia in order to acquire capabilities in advanced manufacturing, software and information technologies. Some examples are:

* BAIC, one of the largest producers of vehicles in China, developed its first high-performance electric car in collaboration with Campos Racing, a company with its R&D centre in Catalonia.

* Hong Kong-based Brinc, the accelerator specialising in emerging technology hardware, especially IoT, is promoting the Drone Accelerator in Barcelona.

* Shiji, the main information systems manufacturer for the Chinese hotel sector, has purchased the Catalan start-up ReviewPro, the world leader in cloud-based guest intelligence applications for hotels, investing a total of €30 million.

* Kinled, a Hong Kong-based holding company, has recently invested in the life sciences sector in Catalonia, attracted by the quality of science and the emerging companies there.

Investors from other European countries and the United States are also developing advanced manufacturing or innovation hub projects in Catalonia.

* Volkswagen has set up an innovation laboratory dedicated to data analysis and the search for smart solutions to the mobility of the future. It has done this at Pier01, the site of one of Europe's largest digital start-up clusters.

* Amazon has announced it will open an R&D centre focused on machine learning in Barcelona. It will employ some 100 engineers and scientists and work in close collaboration with Catalan universities.

* Alstom has converted its plant in Santa Perpètua de la Mogoda into the first advanced manufacturing factory in the railway sector in Spain. For this purpose, it is developing projects with local technology providers, such as Eurecat.

* EGO, the German firm which leads the market in home appliance components, has invested nearly €9 million in extending its R&D centre and home appliance control system production plant, creating a total of 60 new jobs.

All these companies have something in common: they have decided to invest in Catalonia because the region offers a number of drivers that create an ideal environment in which they can work successfully in Industry 4.0 and hi-tech. The regional government has made a commitment to act as a bridge between the environment and the investor, to work to enhance the competitiveness of the region, and to offer foreign companies high value.

High-value services for the investor

Advanced manufacturing is a priority for Catalonia and therefore it forms an essential part of the National Agreement for Industry (PNI), recently approved and implemented, principally by Catalonia Trade & Investment, the agency for business competitiveness. The PNI is a consensus-based instrument that gives companies access to the tools for industrial transformation and for attracting Industry 4.0 investments that can act as a driving force for the fabric of local production.

Catalonia Trade & Investment supports knowledge-intensive investment projects through the Invest in R&D programme, which offers specific services for those investments with a more innovative component. This support was recognised at the 2017 FDI Strategy Awards, where Catalonia Trade & Investment was selected as the top investment promotion agency in the R&D support category.

All these services are of great interest to Chinese investors, who are making an ever stronger commitment to technology and are therefore a prime target of Catalonia's investment attraction strategy.

Thus, for some years now, the government of Catalonia has been working together with other public and private players that have a strong relationship with China, in order to offer investors value and smooth their relations with Catalonia. These players include ESADE, the Port of Barcelona and Barcelona City Council, in addition to various regional governments and municipalities in China, such as Guangdong, Jiangsu and Tianjin. Specific communications and promotion actions for China have also been set in motion, and a services offering has been tailor-made for Chinese companies.

It was in this spirit that some ten years ago the China Desk was set up, which offers project management adapted to the needs of the Chinese investor and a selection of partners with specific knowledge in areas such as human resources, taxation and legal consultancy.

The Catalan government wishes to be close to Chinese investors in order to ascertain their needs in the field, which is why it has had a direct presence in China since 1988. Catalonia currently has a network of 40 foreign trade and investment offices, three of which are located in China (Beijing, Shanghai and Hong Kong).

All this demonstrates the regional government's determination to be at the investor's side and to offer high-value services in specific aspects such as investments in traditional industry, advanced manufacturing and R&D. Catalonia has the assets to become a focal point for foreign investment in these areas and China can be an important ally in achieving this.

Bibliography

- Brown, Kerry. “The Critical Transition: China’s Priorities for 2021”. Chatam House. 2017.
- Casaburi, I. “Chinese Investment Trends in Europe”. ESADEgeo 2017.
- Dollar, D. “China as a Global Investor”. China’s New Sources of Economic Growth, vol. 1: Reform, Resources and Climate Change. 2016.
- Grieger, G. “Foreign direct investment screening. A debate in light of China-EU FDI flows”. European Parliament Research Service (EPRS). 2017.
- Guiso, L., Herrera, H., Morelli, M. y Sonno, T. “Demand and Supply of Populism”. 2017.
- Hanemann, T., Lysenko, A. y Cao, C. “Tectonic Shifts: Chinese Outbound M&A in 1H 2017”. Rhodium Group. 2017.
- Johnson Cornell University, INSEAD y World Intellectual Property Organization. “Global Innovation Index 2016. Winning with Global Innovation”. 2016.
- Kennedy, Scott. “The Fat Tech Dragon. Benchmarking China’s Innovation Drive”. Center for Strategic and International Studies (CSIS). 2017.
- Lardy, N.R. “Markets over Mao”. Peterson Institute for International Economics. Washigton DC. 2014.
- Ling, Cheng y Naughton, Barry. “The Emergence of Chinese Techno-Industrial Policy: From Megaprojects to Strategic Emerging Industries, 2003-2011”. (INCT/PPED).
- Perea, J.R. y Stephenson, M. “Global Investment Competitiveness Report 2017/2018. Outward FDI from Developing Countries”. World Bank. 2017.
- Savant, Karl P. “China moves the G20 on international investment”. Columbia Center on International Investment. 2017.
- Veugelers, Reinhilde. “The challenge of China’s rise as a science and technology powerhouse”. Bruegel. Policy Contribution. 2017.
- Wang, M. “Chinese Overseas Investment”. 2017.
- Wübbeke, Jost, Meissner, Mirjam, Zenglein, Max J., Ives, Jaqueline y Conrad, Björn. “China 2015. The making of a high tech superpower and consequences for industrial countries”. Mercator Institute for China Stuties (MERICS). 2016.
- “China – Industry 4.0 Index 2015”. Staufen. 2015.
- “China innovation system”. World Economic Forum (WEF). 2016.
- “China Tightens Rules on State Groups Foreign Investments”. Financial Times. 2017
- “Evolution of China’s Innovation Performance”. European Commission. 2013.
- “Made in China 2025”: The Making of a High Tech Superpower and Consequences for Industrial Countries”. Mercator Institute for China Studies (MERICS). 2017.
- “MOFCOM, National Bureau of Statistics & State Administration of Foreign Exchange. 2015”. Statistical Bulletin of China’s Outward Foreign Direct Investment. 2016.
- “New Restrictions on China Outbound Investments”. Baker McKenzie. 2017.
- “SOEs face “red line” on investment”. China Daily. 2017.
- “The 2017 AT Kearney Foreign Direct Investment Confidence Index”. AT Kearney. 2017.
- “The Global Information Technology Report 2016. Innovating in the digital economy”. World Economic Forum (WEF). 2016.
- “Trump Heads to China – Is Chinese Investment Still Headed Here?” Rhodium Group. 2017.
- “Venture pulse Q4 2016. Global Analysis of Venture Funding”. KPMG. 2016.
- “World Intellectural Property Report. Breacktrhough Innovation and Economic Growth”. World Intellectual Property Organization. 2015.

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