

# THE DIGITAL ECONOMY, MULTINATIONAL ENTERPRISES AND INTERNATIONAL INVESTMENT POLICY



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## *Foreword*

The digital economy has had a profound impact on the global business landscape. It has given rise to new firms and industries, transformed business models in traditional industries, and, as a key factor underpinning global value chains (GVCs), reshaped the organisation of the global economy. This is generating new challenges and opportunities for the international investment policy community.

This paper examines the implications of digitalisation and digital technologies for international investment and investment policy, with a particular focus on digital policies relating to national security and digital policies directed at business operations.

This paper was prepared by Michael Gestrin, a senior economist, and Julia Staudt, a policy analyst, in the OECD's Investment Division.

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This paper contributes to the OECD Going Digital project which provides policy makers with tools to help economies and societies prosper in an increasingly digital and data-driven world. For more information, visit [www.oecd.org/going-digital](http://www.oecd.org/going-digital).



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## Overview

The digital economy (see box) has started to generate new challenges and opportunities for the international investment policy community. In examining the implications of digitalisation and digital technologies for international investment and investment policy, this paper argues three main points.

First, as digitalisation and digital technologies come to be used more broadly and intensively by multinational enterprises in all sectors of the economy, some of the policy challenges to which digital technologies have given rise, but which have hitherto been limited to the digital sectors, are likely to become broader international investment policy challenges. For example, the widespread adoption of artificial intelligence and the collection of big data could result in a significant broadening of investment reviews motivated by national security and interest considerations.

Second, a growing body of digital policy is likely to play an increasingly important role in shaping internationalisation as digitalisation becomes a key element underpinning the way multinational enterprises (MNEs) organise their international operations. Just as the non-digital sectors have only recently started to build up their digital capabilities, digital policy is likewise at an early stage of development. Digital technologies have given rise to national security concerns over foreign ownership, and various initiatives have sought to set rules on the collection, storage, and use of digital data with a view to, *inter alia*, protecting privacy and consumer choice. These digital policies could progressively give rise to international investment outcomes since they seek to address issues associated with an increasingly important strategic asset for MNEs -- digital data.

Third, the broadening adoption of digital technologies across different sectors could result in a much broader diffusion of these technologies and the productivity gains to which they can give rise. Just as multinationals have long served as ‘internalised’ cross-border transmission channels for goods and services, financial flows, and intellectual property within their international production networks, they could increasingly serve as vehicles to transmit digital technologies globally, as well as the builders of the required digital infrastructure.

It remains however that an inherent tension exists between the potential benefits, both for firms and for economies, of the broadening adoption of digital technologies by MNEs. Governments are also facing mounting pressure to develop policy responses (especially in the realms of national security and privacy) that could run against the trend towards broader digital adaptation, possibly leading to digital fragmentation.

### **The digital economy**

The literature on the digital economy is characterised by many different expressions, many of which lack a clear or shared definition. This includes the expression ‘digital economy’ itself. This paper loosely defines the digital economy as the broader economy as it undergoes the process of becoming increasingly digital. The expression ‘digital firms’ or ‘digital sectors’ is used in reference to firms or sectors whose main business segments relate to digital data, platforms, or technologies, such as internet publishing, social media platforms, and some manufacturing that is specific to the functioning of the digital economy, such as the sensors connected to digital networks. Finally, the expressions ‘non-digital firms’ and ‘traditional’ firms and sectors are used to discuss sectors whose main business segments do not relate to digital data, platforms, or technologies, e.g. mining, retail, transportation, construction.

## 1. Introduction

The digital economy has had a profound impact on the global business landscape. It has given rise to new global firms and industries, it has transformed business models in traditional industries, and, as a key factor underpinning global value chains (GVCs), it has reshaped the organisation of the global economy.

The digital economy has generated some new challenges for the international investment policy community. For example, many digital technologies have military applications and therefore give rise to concerns over foreign ownership. And some digital policies, such as digital localisation and data sharing requirements, would seem to constitute new digital era performance requirements. Despite these and other interlinkages between the digital economy and the international investment regime, few studies have focussed on the implications of the digital economy and of digital policies for international investment and investment policy.<sup>1</sup> This paper seeks to contribute to a better understanding of these relationships.

Section 2 summarises the main building blocks of the digital economy. Section 3 considers some of the implications of the digital economy for multinational enterprises (MNEs) and international investment. Section 4 considers two broad areas of digital policy that have or could have implications for international investment and investment policy: digital policies relating to national security and digital policies directed at business operations. The paper concludes with some considerations for international investment policy makers.

## 2. The building blocks of the digital economy

The three main building blocks of the digital economy are digital data, digital technologies and digital infrastructure.<sup>2</sup> Digitalisation involves the conversion of things (sound, shapes, information, etc.) into digital data, which can be infinitely (re)processed and stored at negligible marginal cost. Digital data has been the basis for new business models in many traditional industries and has given rise to new industries. In many sectors, “big data” generated by social networks or algorithms has become an increasingly valuable strategic asset for firms (OECD, 2015b).

Digitalisation has, in turn, led to the emergence of new kinds of digital technologies (information and communication technologies, ICT) which has fuelled the development of new products and services. These range from digitally enhanced devices such as smart machines (e.g. internet of things), to digital platforms (e.g. e-commerce, social networks), to entirely new technologies (e.g. blockchains<sup>3</sup>).

An important building block for digital technologies and data-driven economies was the development of a secure and high-speed digital infrastructure (OECD 2017b). It is composed of a multitude of local, national and global networks owned by different entities and builds the foundation for digital services, applications and business models. Due to the rapid advancement of digital data and digital technologies, as well as the emergence of cloud computing, data storage has become an important infrastructure component at the firm level.

In many respects the digital economy has changed business models. For example it brings about healthcare solutions based on data and artificial intelligence rather than pharmaceutical research (Neville, 2017) while design and manufacturing depend increasingly on artificial intelligence (AI) and algorithms rather than on traditional engineering (Gauger et al., 2017; McKinsey, 2013). Companies across sectors are adapting to an increasingly digital business environment by building up internal capabilities as well as by acquiring external assets and knowledge from across the world.

### 3. The digital economy's implications for international investment patterns

While a considerable body of literature has documented the growing importance of the digital economy for a wide range of economic and social issues, only recently have researchers started to shed light on the implications of the digital economy for international investment trends. A number of common themes emerge.

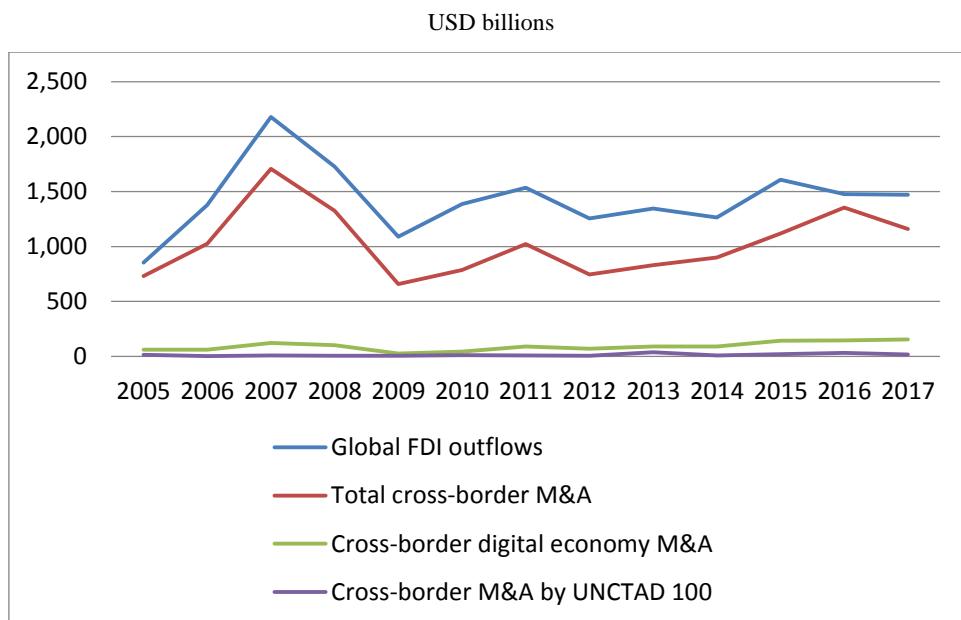
One of the most important of these relates to the different ways in which the digital economy is expected to reduce the need for a physical presence to service foreign markets by facilitating the transmission of a wide range of goods and services in digital form; for example, music, publications, and services ranging from architectural design to retail can now be delivered globally in digital form. Physical products can be generated for customers in foreign markets by sending digital files to 3D printers located in those markets.

From an international investment perspective, the main implication is that “the trade-off between exporting and market-seeking FDI as market entry modes for delivering products to host countries may be shifting toward exporting” (Eden, 2016, p.6). Likewise, UNCTAD (2017) concludes that “market-seeking FDI and efficiency-seeking FDI are partially undermined by digitalisation”. The ability of firms to access international markets with smaller “asset footprints”, thanks largely to the digital economy, has been associated with the emergence of so-called micro-multinationals and the born-global firms that quickly attain global reach with minimal cross-border investment.

Another theme in the early empirical literature on the impact of the digital economy on international investment patterns concerns the growing importance of digital infrastructure for the ability of countries to attract FDI. Just as the digital economy has played a central role in facilitating the emergence and spread of global value chains (De Backer, K. and D. Flaig, 2017), the capacity of countries to provide the required digital infrastructure for more digital-intensive international production networks is expected to become an increasingly important new determinant of MNE location decisions.

Although the digital economy will continue to have transformative and disruptive implications for businesses, major disruptions for multinationals and international investment trends, such as declines in the use of FDI by firms as a mode of market access, have yet to be observed. Digital technologies have given rise to new businesses and international business models that have allowed some firms to build a global presence without significant amounts of FDI, but FDI continues to underpin the internationalisation strategies of firms in more traditional “bricks and mortar” industries (UNCTAD, 2017, Figure IV.7, p. 170).

This is reflected in the modest contribution of digital firms to overall cross-border investment flows (figure 1). Despite accounting for an estimated USD 6 trillion in digital capital investment already in 2013 (Bughin et al, 2013), digital firms only generated USD 153 billion of cross-border M&A in 2017 (13% of total cross-border M&A).<sup>4</sup> The 100 largest digital economy MNEs only accounted for USD 20 billion in cross-border M&A in 2017, about 1% of total cross-border M&A (UNCTAD, 2017).

**Figure 1. Global FDI and M&A flows, 2005-2017**

Source: OECD FDI database, Dealogic M&A Analytics database, UNCTAD (2017), and authors' calculations.

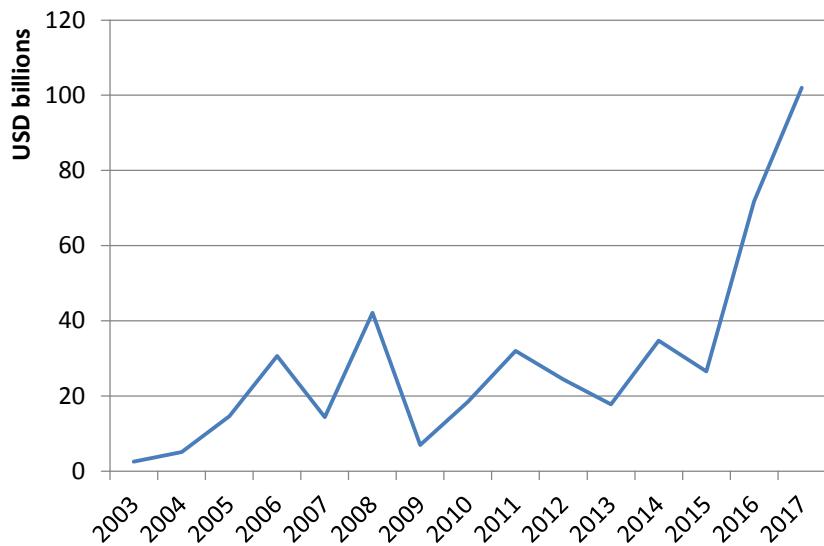
Although the contribution of digital firms to international investment flows has been modest to date, a number of recent trends suggest that the role of digital technologies in the international investment regime is growing. While global cross-border M&A has experienced an average annual growth rate of 9% since 2010,<sup>5</sup> the average annual growth rate of cross-border M&A by digital firms during this period was 30%. The largest 100 digital firms identified in UNCTAD (2017) grew their cross-border acquisitions on average by 90% annually over the same period. In other words, while many of these firms are following business models based around relatively light FDI footprints, they are nonetheless rapidly growing their cross-border physical presence.

A large share of this international investment is going into digital infrastructure. For example, cross-border investment to acquire digital data storage assets reached USD 13.8 billion in 2016, the highest level on record.<sup>6</sup> Cross-border investments to acquire intangible assets (i.e. knowledge-seeking FDI) have also been an important driver of the growth in cross-border digital investment. For example, cross-border acquisitions to acquire software developers increased fifteen-fold since 2009 to reach USD 102 billion in 2017 (figure 2).

A key factor behind the recent rapid growth in M&A directed at acquiring digital assets has been the sharp increase in the acquisition of digital assets by non-digital firms (figure 3). Up until 2014, non-digital and digital firms were roughly equal in terms of their acquisition of digital assets. Beginning in 2015, the former significantly increased their digital acquisitions, going from acquiring USD 78 billion in digital assets in 2013 to acquiring USD 458 billion in 2016.

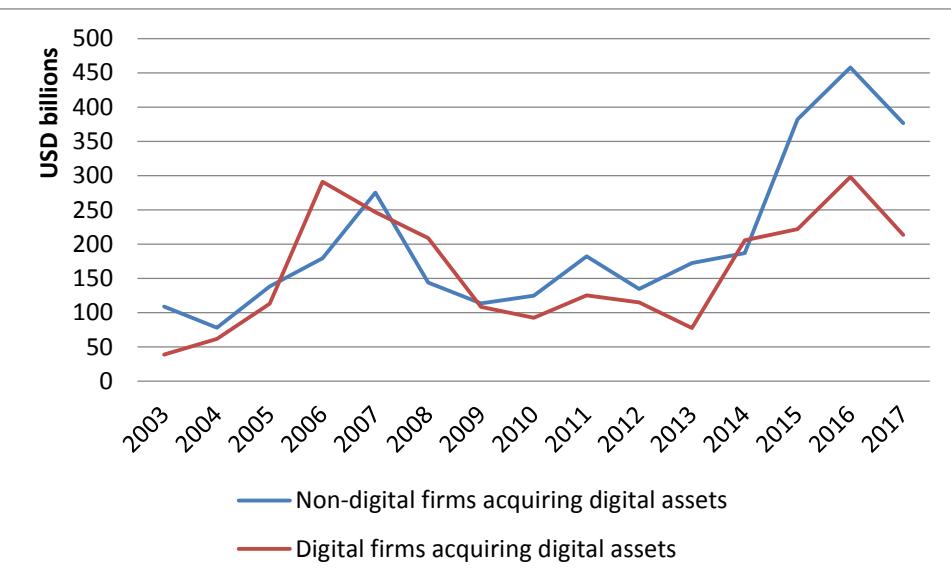
This acceleration of investments in the digital economy by non-digital firms could presage more pronounced international investment effects than have been observed until now. As MNEs in traditional sectors such as agri-business, real estate, construction, healthcare, professional services, and retail build up their in-house digital capacities (figure 4), hybrid international business models requiring less FDI (or otherwise redefining ownership patterns in global value chains) are likely to emerge outside of the digital economy itself.<sup>7</sup>

**Figure 2. Cross-border M&A into software publishers, 1995-2017**

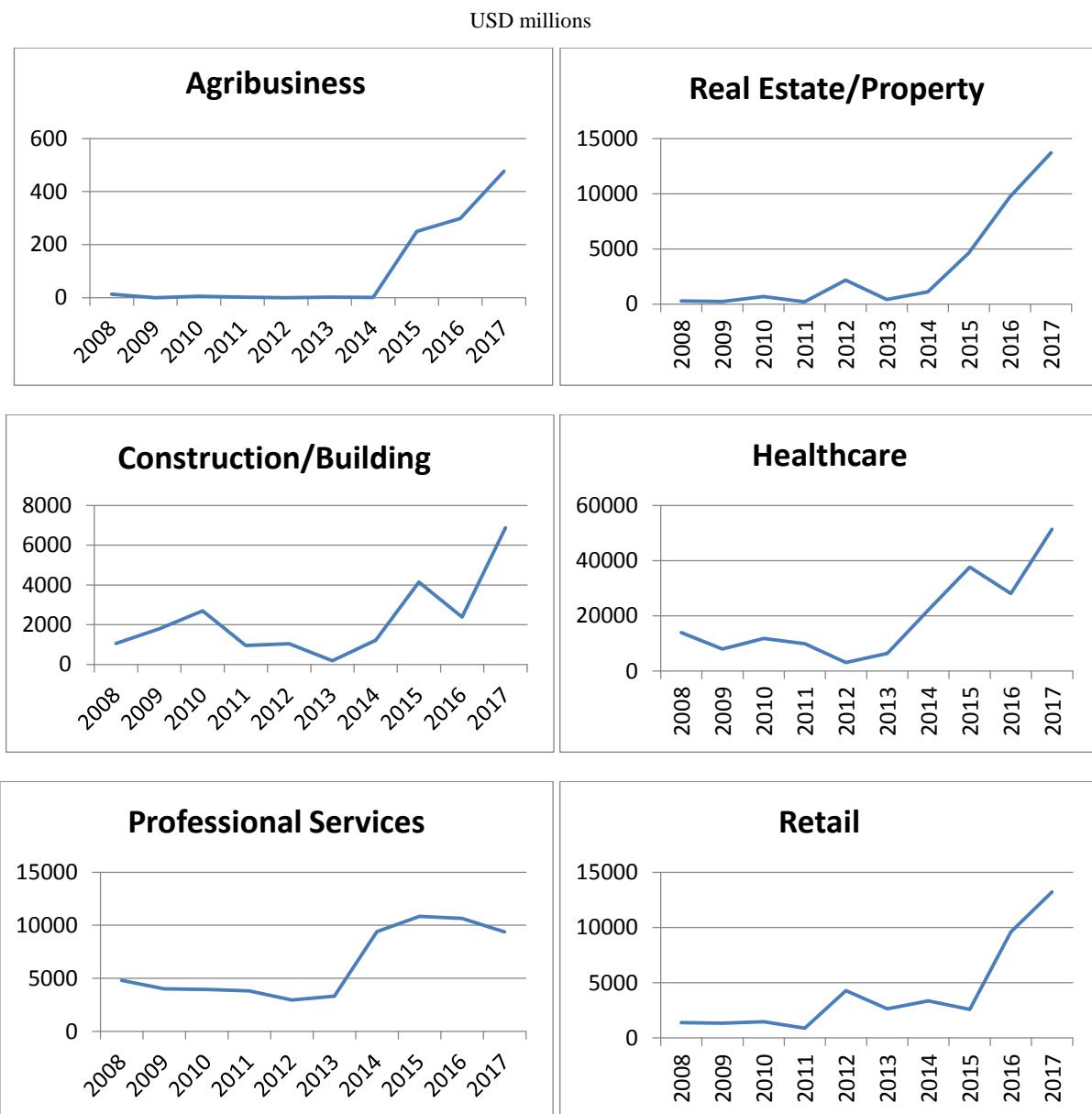


Source: Dealogic M&A Analytics database, authors' calculations

**Figure 3. The acquisition of digital assets by non-digital firms, 2003-2017**



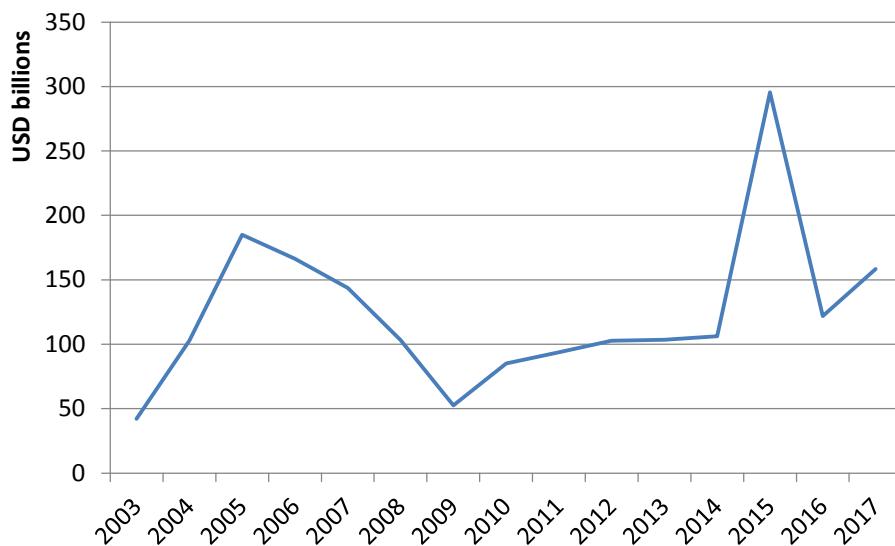
Source: Dealogic M&A Analytics database, authors' calculations

**Figure 4. Non-digital sectors acquiring digital assets, 2008-2017**

Source: Dealogic M&A Analytics database, OECD calculations

The reverse trend -- digital firms acquiring non-digital assets -- has not been as clear or strong. In 2017, digital firms acquired USD 158 billion in non-digital firms, which is up from the levels following the financial crisis but still well below the USD 591 billion of digital assets acquired by non-digital firms (figure 5). The greater interest on the part of non-digital firms in acquiring digital assets than the other way around probably reflects the greater potential for productivity and competitiveness gains of digital adaptation for firms in non-digital sectors. Notwithstanding the general trend, some sectors have seen more digital-to-non-digital hybridisation than others. The retail sector provides a good example of this trend, with Amazon's acquisition of the traditional retailer Whole Foods in 2017, and Wal Mart's acquisition of Jet.com in 2016.

**Figure 5. Acquisitions of non-digital assets by digital firm acquirers, 2003-2017**



Source: Dealogic M&A Analytics database, authors' calculations

The geography of cross-border investments in the digital economy is heavily concentrated in, but not monopolised by, developed economies. Over the five years from 2013 to 2017, the United States and the United Kingdom each received over USD 100 billion in inward M&A investments in digital assets, and together accounted for 49% of all cross-border digital M&A. They were followed by a group of four economies that received over USD 20 billion in inward M&A investments in digital assets, comprised of the Netherlands, the People's Republic of China (hereafter China), Germany, and Israel. India, Japan, Singapore, France, Finland, Sweden, Austria, and Canada all received over USD 10 billion in inward M&A investments in digital assets (table 1). The top 20 home economies to (or sources of) international M&A investments in digital assets is likewise concentrated in more developed economies, but nonetheless includes China, Chinese Taipei, South Africa, Hong Kong (China), India, and Oman.

Fifteen economies appear in the top 20, both as attractive destinations for digital M&A and as leading sources of cross-border M&A investments. This means that ten economies only appear in one of the two lists. The five economies that are attractive hosts/destinations but that do not appear in the top 20 sources of digital M&A are Singapore, Finland, Austria, Italy, and Peru. The five economies that are top 20 sources of digital M&A investments but do not appear in the top 20 destinations are South Korea, Ireland, South Africa, Denmark, and Oman.

These cases raise an interesting economic and policy question since we would normally expect the factors that determine attractiveness to foreign digital investors to be the same as those that determine the ability to generate outward digital investment. One possible explanation is that countries follow a digital development path in which a country first develops the factors that attract inward digital investment (human resources, good digital infrastructure) and, at a later stage after this digital investment has matured, outward digital investment follows. Developing a better understanding of these dynamics could be the focus of future research.

**Table 1. Top 20 host and home countries for digital economy cross-border M&A investments, 2013-2017**  
 (USD millions)

Rank	Host country	Inward digital M&A	Share of total	Rank	Home country	Outward digital M&A	Share of total
1	United States	174658	28	1	United States	157976	25
2	United Kingdom	130343	21	2	Japan	142285	23
3	Netherlands	36636	6	3	Germany	48277	8
4	China	34121	5	4	China	48037	8
5	Germany	28735	5	5	Netherlands	43720	7
6	Israel	23732	4	6	France	42207	7
7	India	18620	3	7	United Kingdom	30537	5
8	Japan	17611	3	8	Canada	20347	3
9	Singapore	14297	2	9	South Korea	13290	2
10	France	13970	2	10	Ireland	10963	2
11	Finland	13019	2	11	Australia	8555	1
12	Sweden	12474	2	12	Switzerland	5864	1
13	Austria	10486	2	13	Chinese Taipei	5406	1
14	Canada	10241	2	14	South Africa	4991	1
15	Switzerland	8626	1	15	Sweden	4118	1
16	Italy	8151	1	16	Hong Kong, China	3605	1
17	Chinese Taipei	7979	1	17	Denmark	3509	1
18	Australia	5623	1	18	India	2828	0
19	Hong Kong, China	5038	1	19	Israel	2713	0
20	Peru	4347	1	20	Oman	2195	0
<b>Rest of world</b>		<b>41978</b>	<b>7</b>	<b>Rest of world</b>		<b>20437</b>	<b>3</b>
<b>Total</b>		<b>620685</b>	<b>100</b>	<b>Total</b>		<b>621857</b>	<b>100</b>

*Note:* The use of statistical data for Israel by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

*Source:* Dealogic M&A Analytics database, authors' calculations

In sum, the digital economy has not yet brought about major changes to the international investment regime or to the ways in which most MNEs structure their international operations. Foreign direct investment continues to play an important role for firms outside of the digital economy as a means of expanding internationally. However, the most recent data indicate a sharp increase in the cross-border acquisition of digital corporate assets by firms outside of the digital economy starting around 2016. If this trend continues and leads to the widespread adoption of hybrid business models involving the application of digital technologies in more traditional manufacturing and services industries, this could hold at least three broad implications for the international investment policy community:

- First, non-digital MNEs could become increasingly important cross-border channels for digital data and technologies, just as they have served as important cross-border channels for goods, services, financial flows, and more traditional technologies in the past;
- Second, digital infrastructure, such as cross-border telecommunications connections and digital storage capacity, will become an increasingly important determinant for the FDI localisation decisions of MNEs and for the investment promotion and facilitation efforts of governments;

- Third, policies regarding the collection, storage, and use of digital data will increasingly influence the ways in which digitally-intensive MNEs organise their international production networks and the modalities they choose (e.g. FDI versus licencing) for participating in foreign markets.

## 4. Investment policy in an increasingly digital world

Investment policies have not undergone any major changes in response to the digital economy. However, as highlighted in the previous section, the digital economy is internationalising rapidly, especially as it spreads into the non-digital economy. This is likely to have implications for the international investment policy community. While UNCTAD (2017) emphasises the implications of investment policies for supporting digital development strategies, this section focuses on the implications of digital policy for international investment. A key challenge is that many digital policies can give rise to investment policy outcomes, even though they have not necessarily been formulated with traditional investment policy objectives in mind. Two broad areas of digital policy (or digitally-motivated policy) stand out; digital policies related to national security and digital policies related to business operations.

### Digital policies related to national security

Foreign ownership can give rise to national security concerns for governments. Some countries have developed specific policies to address these concerns while maintaining openness to foreign investment (OECD, 2009).<sup>8</sup> The types of transactions that have given rise to national security concerns have evolved over time.<sup>9</sup> Examples of foreign investments that have given rise to security concerns include the acquisition by foreign firms of so-called dual use technologies<sup>10</sup>, the foreign acquisition of critical infrastructure, and, more recently, investments by foreign state-owned enterprises (OECD, 2016). The digital economy has given rise to national security concerns that can be categorised according to the different digital building blocks presented in section 2.<sup>11</sup> The following list provides examples:

- Digital data
  - Digital databases when including sensitive information of customer or citizen behaviour (such as financial transactions) or when involving military or governmental information (Khan, 2017)
  - Data storage infrastructure when hosting classified government information, including defence and intelligence files (Uhlmann, 2017)
  - Information technology and telecommunication software when used for the operation of data storage facilities, data transmission and data processing.
- Digital technology
  - Technologies based on semiconductors when having dual use options ranging from medical technologies to biodefense detection systems as they are critical for defense and military strength and, due to the pervasiveness of semiconductor devices, important for mitigation of cybersecurity risk (PCAST, 2017)
  - Critical technology when including *inter alia* key national technologies; stealth technologies; nanotechnologies; technologies for high thermal degree composite materials; meta-materials technologies; and design and production of frequency selective surfaces (FSS) or materials.

- Digital infrastructure
  - Telecommunication and communication infrastructure with high system interdependence and vulnerability to intrusions or disruptive activities by foreign intelligence services or (cyber) espionage (Rogers, Ruppersberger, 2012);
  - Manufacturing or manufacturing knowledge of technical facilities when meant for the lawful monitoring of telecommunication;
  - Industry specific software used when used for the operation of critical infrastructure;
  - Software when used for power plant control technology, grid control technology or control technology for systems of power supply, gas supply, fuel or heating supply.

Few governments have significantly altered their approaches to preserving national security because the mechanisms in place have been deemed adequate for dealing with new potential sources of concern to which the internationalisation of the digital economy has given rise. Nonetheless, some governments have become more explicit in recognising digital issues in their approaches to national security.

For example, Germany has recently clarified its FDI review mechanism because of a "changing security landscape" concerning "civic security-relevant technologies". The directive, an amendment to the foreign trade regulations, aims at setting clearer rules for the review of acquisitions from non-EU investors.<sup>12</sup> It puts a focus on companies that host critical infrastructure; produce industry-specific software for that infrastructure; or work with surveillance mechanisms, cloud-computing-services or telematics infrastructure.

Although not specifically directed at digital economy issues, France, Germany and Italy called for EU policies to permit national governments an "additional protection" from investments by foreign buyers in "areas sensitive to security or industrial policy" in February 2017.<sup>13</sup> Along similar lines, the Group of the European People's Party, the largest political group in the European Parliament, issued a proposal for the "Screening of Foreign Investment in Strategic Sectors" in March 2017. The proposal calls for the creation of a "European Committee on Foreign Investment" that would review, investigate and control sensitive foreign investments within the European Union.<sup>14</sup> The European Council summit in June 2017 concluded that it should "analyse investments from third countries in strategic sectors, while fully respecting member states' competences".<sup>15</sup> Other European countries such as the United Kingdom and the Netherlands are also considering strengthening their screening of foreign direct investment (FDI) on national security grounds.

In the United States, screening of foreign investments from a national security perspective is carried out by the Committee on Foreign Investment in the United States (CFIUS).<sup>16</sup> In 2016, more than 170 transactions were reviewed in total, many of them technology-related. Whereas the vast majority of foreign investments involving high technology were approved, three exceptions were related to semiconductor technology. The proposed acquisition of Lumileds from Philips, a Dutch company, by a Chinese consortium was not carried out due to non-disclosed concerns, the acquisition of Aixtron, a German semiconductor company, was blocked by a presidential executive order, and the sale of Global Communications Semiconductors to Sanan Optoelectronics, a Chinese semiconductor company, was abandoned due to CFIUS concerns.

An illustrative list of the various ways that governments have reflected digital concerns in their national security screening procedures is presented in Annex 1. A key issue going forward relates to the recent increase in the acquisition of digital corporate assets by firms outside of the digital economy. To the extent that these two trends converge, namely the increased attention paid to digital technologies in the screening of foreign investments on national security grounds and the acceleration in the digitalisation of

traditional industries, an almost inevitable result would be a much broader scope for international investment reviews based upon national security considerations.

## Digital policies related to business operations

The digital economy has motivated policy makers across a range of different areas to put in place new laws and regulations to deal with various new challenges to which digital technologies and business practices have given rise. For example, some competition authorities have raised concerns about the market power that some digital firms have developed, as well as the scope for using certain digital technologies to support anti-competitive practices (see for example OECD, 2017c).

The digital economy would seem to have given rise to fewer concerns for the international investment policy community to date, perhaps reflecting the relatively modest impact of the digital economy on the international investment regime. Nonetheless, some policies aimed at regulating certain aspects of the digital economy could have increasingly important implications for international investment and the operations of MNEs, especially as digital technologies and business models become more prevalent outside of the digital economy itself. These mainly relate to the increasingly important role that digital data play in multinational business strategies and the growing number of ways that governments have started to regulate the use of these data.

One of the most important of these policy areas relates to data localisation. Data localisation requirements generally stipulate that firms must store digital data in the host country. Storing digital data necessitates data centres where data is stored, managed and processed on a network of high-performance servers. It is a central point where digital information is gathered so it can be distributed to other data centres or the end-user. Firms either set up their own data storage infrastructure or outsource this service.

Multinational enterprises are technically able to store their digital data anywhere in the world. In the absence of data localisation requirements firms tend to store their data or locate their own data centres where domestic and international telecommunication connections are of high quality, energy costs are relatively low, and where climactic conditions reduce cooling costs.<sup>17</sup> Data localisation requirements therefore usually entail additional costs for firms, such as the investment in storage capacity itself, duplication of servers, and additional data management and compliance requirements.

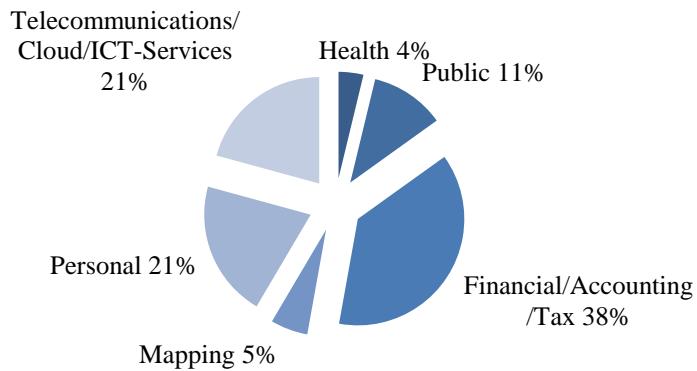
Digital data localisation requirements are becoming more common. This paper has identified 53 such measures in 25 countries. Forty of these have been adopted since 2010. The measures differ in their level of restrictiveness. Some require that certain conditions are met before data can be stored abroad (i.e. the extraterritorial application of the host-country digital data policies); others require, directly or indirectly, the local storage of data. The compulsory measures can be divided into two groups. Some require local data storage conditional or no restrictions on cross-border flows of these data while others ban cross-border flows completely.

Conditional local storage requirements often stipulate a time frame during which information must be stored locally. They can also entail the need for government authorisation to transfer certain data abroad, or requirements for firms to provide the government with access to digital data upon request if the data is stored abroad. Fifteen of the 53 localisation measures identified have these “conditional” qualities.

Local storage requirements tend to target particular types of data. In most cases, the data has a sensitive component. It either refers to personal data (data relating to the physical, physiological, mental, economic, cultural or social identity of a data subject) or data of particular importance or sensitivity (such as financial or government data). Among the 53 data localisation measures identified, about 40% of these target financial or company data, ranging from accounting to financial data of customers,

another 40% cover personal data, and the remaining 20% cover data on telecommunications, cloud, and ICT services (figure 6).

**Figure 6. Types of digital data subjected to data localisation**



*Source:* Authors' calculations based on an analysis of the 55 localisation measures identified for this study.

Closely related to localisation requirements are the rules and regulations concerning the treatment and use of digital data. These requirements are often motivated by concerns over the protection of privacy. For example, in April 2016 the European Parliament approved the European Union's General Data Protection Regulation (GDPR) which will come into effect mid-2018.<sup>18</sup> The regulation's objective is to streamline data protection legislation across the EU, promote a digital single market, and support police and security cooperation.<sup>19</sup>

The GDPR was designed to give citizens increased control over their personal data and establishes a "privacy by design and default" approach. One key concept in this context is the right to "data portability". It allows users to carry data from one provider to the next. More specifically, data portability contained under Article 20 allows individuals to obtain, move, copy or transfer personal data from one IT environment to another without a hindrance in usability. The regulation's objective is to provide a safe and secure way for sharing data between data controllers and to protect consumers from being "locked-in" with one particular provider.<sup>20</sup>

The different policies that governments have increasingly been putting in place to govern the use of digital data could give rise to concerns for the international investment policy community. One of these relates to standards. To the extent that governments put in place different standards for the storage and use of digital data, this could serve to make cross-border data flows more costly and complex to manage for firms that increasingly depend on frictionless digital data flows across borders to run their international operations. In some cases, these new digital complexities have started to give rise to negative financial consequences for digital MNEs. For example, in 2016 LinkedIn, the on-line network for professionals, was found to be in breach of Russia's data localisation regulations and barred from operating in the country (Scott, 2016). To the extent that digitalisation continues to spread beyond the digital economy into more traditional MNE-dominated manufacturing and services sectors, this issue could become more challenging from an international investment policy perspective.

Beyond the potential for this sort of regulatory digital fragmentation, another concern for MNEs relates to the scope for governments to require firms to share the personal data they collect for surveillance (including outside of their own jurisdictions) as a new digital form of establishment requirement. For example, Uber, the ride-sharing company, was asked to provide the Egyptian government with access to real-time personal data on the movements of all of its passengers (Walsh, 2017). In cases such as this,

government demands relating to digital data could effectively present MNEs with a difficult choice as between foregoing the market in question or dealing with the moral and legal risks of complying with such demands.

## 5. Conclusions

Digital firms and sectors have grown rapidly over the past decade and have had a transformative effect on the global economy. Yet, at the same time, this paper has found limited evidence of this transformative power in the international investment regime. Even as some digital firms have internationalised rapidly, they have generally done so based upon light FDI footprints and firms in more traditional sectors continue to account for the bulk of the world's largest MNEs and FDI (80% of the top 100 according to UNCTAD 2017).

Yet, some of the trends identified in this paper hint that the digital economy's potential relevance for the international investment policy community is about to increase rapidly, with important implications in three related areas.

First, the integration of digital data and technologies into the operations and business models of non-digital MNEs has been accelerating in recent years and digital firms have, to a lesser extent, begun to move into some more traditional industries. Such emergent hybrid business models could lead to a new chapter in investment globalisation which would see some of the business dynamics that have until now remained relatively specific to the digital economy itself, spread more broadly in the economy. This could include the winner-take-all dynamics often ascribed to the digital economy due to network economies, the spread of the lighter asset footprint business model beyond the digital economy, and the rise of digital data as a key basis for both firm-level and country-level competitive advantage.

Second, a growing body of digital policy will likely play an increasingly important role in shaping internationalisation as digitalisation becomes a key element underpinning the way MNEs organise their international operations. Just as many non-digital sectors have only recently started to build up their digital capabilities, digital policy is likewise at an early stage of development. Digital technologies have given rise to national security concerns over foreign ownership, and various initiatives have sought to set rules on the collection, storage, and use of digital data with a view to, *inter alia*, protecting privacy and consumer choice. These digital policies could increasingly give rise to international investment outcomes since they seek to address issues associated with an increasingly important strategic asset for MNEs -- digital data.

Third, the broadening adoption of digital technologies across different sectors could result in a much broader diffusion of these technologies and the productivity gains to which they can give rise. Just as multinationals have long served as 'internalised' cross-border transmission mechanisms for goods and services, financial flows, and intellectual property, they could increasingly serve as vehicles to transmit digital technologies globally, as well as to build the required digital infrastructure.

It remains however that an inherent tension exists between the potential benefits, both for firms and for economies, of the broadening adoption of digital technologies, and the mounting pressure on governments to address concerns over national security and privacy. These concerns and the associated proliferation of digital and investment policy responses, while mainly legitimate, could slow or even impede the broader adoption of digital technologies in the economy. Given the cross-border dimension of the digital economy, a lack of international co-operation to address these challenges risks giving rise to digital fragmentation.

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## Annex 1. Illustrative list of national security provisions with a digital dimension

Country	Description of Measure	Date	Reference to Digital	Source
Canada	The Canadian Government issued <a href="#"><u>Guidelines on the National Security Review of Investments</u></a> under the <i>Investment Canada Act</i> . The Guidelines provide information to investors about the administration of the Act's national security review process and include factors that the Government considers when assessing whether an investment poses a national security risk.	19.12.2016	<p>... the nature of the asset or business activities and the parties involved in the transaction will be considered:</p> <ul style="list-style-type: none"> <li>ii. The potential effects of the investment on the <b>transfer of sensitive technology or know-how outside of Canada</b>;</li> <li>iii. Involvement in the research, manufacture or <b>sale of goods/technology identified</b> in Section 35 of the Defence Production Act;</li> <li>iv. The potential impact of the investment on the security of Canada's critical infrastructure. <b>Critical infrastructure refers to processes, systems, facilities, technologies, networks, assets and services essential to the health, safety, security or economic well-being of Canadians and the effective functioning of government</b></li> </ul>	<a href="#"><u>"Guidelines on the National Security Review of Investments"</u></a> . <a href="#"><u>"Attracting global investments to develop world-class companies"</u></a> , Government of Canada news release, 19 December 2016.
China	The National Security Law is a framework law. It lays down the general principles and obligations of the State in maintaining security in the country.	01.07.2015	Article 59 of the Law allows the State to establish, inter alia, a national security review and oversight mechanism to conduct a national security review of foreign commercial investment, <b>special items and technologies, internet services</b> and other major projects and activities which might impact national security. The framework for such reviews based on national security considerations had first been established in 2011.	<a href="http://www.chinalawtranslate.com/2015nsl/?lang=en"><u>http://www.chinalawtranslate.com/2015nsl/?lang=en</u></a>

Country	Description of Measure	Date	Reference to Digital	Source
China	In 2012, a revised “Catalogue for Guidance for Foreign Investment” came into effect. The Catalogue, published by the National Development and Reform Commission (NDRC) in late December 2011, expresses the Chinese government’s receptiveness of foreign investment in specific sectors as “encouraged”, “restricted”, or “prohibited”.	30.01.2012	The new edition of the Catalogue has moved products and <b>technologies in the textile, chemical and mechanical manufacturing industries</b> to the category “encouraged”; the new edition of the catalogue also reduces the Chinese share in joint ventures in certain areas where foreigners can only invest through joint ventures.	<a href="#"><u>“Catalogue for the Guidance of Foreign Investment Industries (Amended in 2011) Jointly Promulgated by the National Development and Reform Commission and the Ministry of Commerce of the People's Republic of China”</u></a> , Decree of the National Development and Reform Commission, the Ministry of Commerce of the People's Republic of China, No.12.
	In 2015, the Ministry of Industry and Information Technology relaxed foreign ownership restrictions <b>in the e-commerce sector</b> ; henceforth, 100% foreign ownership is allowed in this sector.	19.06.2015	The liberalisation followed the issuing of the State Council <i>Opinions on Vigorous Development of E-Commerce to Accelerate the Cultivation of a New Driving Force in the Economy</i> on 4 May 2015.	<a href="#"><u>“Circular of the Ministry of Industry and Information Technology on Liberalizing the Restrictions on Foreign Shareholding Percentages in Online Data Processing and Transaction Processing Business (For-Profit E-Commerce Business)”, [2015] Circular No. 196.</u></a>
France	In 2014, the Minister of Economy issued a decree amending the articles of the law that inter alia regulates foreign investment.	14.05.2014	The decree amends the list of activities subject to review for foreign investors equipment, services and products that are essential to safeguard national interests in the areas of public order, public security and national defence, as follows: i) sustainability, integrity and safety of energy supply (electricity, gas, hydrocarbons or other sources of energy); ii) sustainability, integrity and safety of water supply; iii) sustainability, integrity and safety of transport networks and services; iv) <b>sustainability, integrity and safety of electronic communications networks and services</b> ; v) operation of a building or installations of vital importance as defined in articles L. 1332-1 and L.1332-2 of the Code of Defence; and vi) protection of public health.	<a href="#"><u>Code Monétaire et Financier, Articles L151-3 and R153-2; Decree No. 2014-479 of 14 May 2014.</u></a>

Country	Description of Measure	Date	Reference to Digital	Source
Germany	In 2013, changes to the German review mechanism for foreign investment came into effect.	01.09.2013	The changes clarify that an investment in a company that has in the past produced a <b>specific type of cryptographic equipment</b> and is still in the possession of the related technology, even though the company is no longer producing such cryptographic equipment, can be subject to a sector-specific review.	<a href="#">Außenwirtschaftsverordnung</a> , 2 August 2013, BGBl. I p. 2865.
	In 2017, the Federal Ministry for Economic Affairs and Energy introduced an amendment to its Foreign Trade and Payments Ordinance, which complements the Foreign Trade and Payments Act. Under the new rules, the acquisition by foreign investors of significant shareholdings in German companies will be subject to an enhanced government control from a public policy and security viewpoint.	12.07.2017	The directive puts a focus on companies that <b>host critical infrastructure; produce industry-specific software for it; work with surveillance mechanisms, cloud-computing-services or telematic infrastructure</b> .	<a href="#">Verordnung der Bundesregierung Neunte Verordnung zur Änderung der Außenwirtschaftsverordnung</a>
Republic of Korea	In 2012, an amendment to the <i>Act on Prevention of Divulgence and Protection of Industrial Technology</i> came into effect. The amendment, introduced by law passed on 25 July 2011, introduces the obligation for Korean companies to notify the government and obtain its approval for foreign investments, including mergers or acquisitions or joint investments with foreign entities.	26.01.2012	Takeover attempts by foreigners need to be brought to the attention of the government. Moreover, if the Minister of Knowledge Economy deems that the divulgence of national <b>core technology may seriously affect Korea's national security</b> , it may suspend, prohibit, or unwind the operation.	

## Notes

<sup>1</sup> Eden (2016) represents one early contribution. Other studies have focussed on the reverse relationship, namely how international investment and policy affects the digital economy, see e.g. UNCTAD (2017).

<sup>2</sup> More comprehensive analysis of the characteristics of the digital economy can be found in OECD (2015a), OECD (2017a) and OECD (2014).

<sup>3</sup> Blockchains are a type of distributed ledger technology (DLT) which provides a decentralised database, or “digital ledger”, of ordered records. From a business and economic perspective, the main implication of blockchains is that they can render certain centralised governance functions obsolete. For example, blockchains can be used to create a currency (e.g. Bitcoins) without the oversight of a central bank.

<sup>4</sup> In analysing M&A patterns, this paper defines digital firms as those belonging to any of the following North American Industry Classification System (NAICS) codes: semiconductor manufacturing (33441), navigational, measuring, electro-medical, and control instruments manufacturing (33451), electronic shopping and mail order houses (45411), business to business electronic markets (42511), software publishers (51121), internet publishing and broadcasting (51611), internet service providers (51811), data processing and hosting (51821), and computer systems design and related services (54151). Telecommunications service providers are excluded on the grounds that they represent a distinct segment related to digital infrastructure. Their inclusion does not significantly change the overall results and empirical narrative presented in this section given the very heavy weighting of semiconductor, software publishers, and internet service providers in the results.

<sup>5</sup> Global FDI outflows experienced an annual average growth rate of 5% over this period.

<sup>6</sup> Interestingly the real estate/property and metal and steel sectors accounted for just over half of this investment.

<sup>7</sup> An interesting feature of acquisitions involving digital firms or assets as targets is the highly fungible nature of these assets compared to traditional manufacturing or even many services assets a firm might acquire. For example, the acquisition of a digital platform by an MNE in one country can instantly be accessed or used by the MNE’s affiliates around the world. For this reason Figure 3 presents overall M&A for non-digital firms acquiring digital assets and digital firms acquiring digital assets, which includes both cross-border and domestic transactions. The acquisition of a digital asset does not need to be a cross-border acquisition to give rise to cross-border implications for the operations of the firm.

<sup>8</sup> According to the “Code of liberalisation of capital movements” OECD member countries can restrict FDI when deemed necessary for (1) maintenance of public order or the protection of public health, morals and safety; (2) protection of essential security interests; and (3) fulfilment of obligations relating to international peace and security. [www.oecd.org/investment/codes.htm](http://www.oecd.org/investment/codes.htm)

<sup>9</sup> For a more detailed analysis of the evolution of investment policy approaches to address national security concerns see, for example, Wehrlé, F. and Pohl, J. (2016) and OECD (2009).

<sup>10</sup> Technologies with both civilian and military applications.

<sup>11</sup> An illustrative list of recent investment measures related national security that have a digital component can be found in Annex 1.

<sup>12</sup> The amendment was introduced after the acquisition of Germany’s high-tech robotics manufacturer, Kuka AG, by MECCA International, a subsidiary of Chinese Midea Group in 2016.

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Due to the sophistication of Kuka's technology, the acquisition sparked concerns that key technologies were coming under foreign control.

<sup>13</sup> Proposals for ensuring an improved level playing field in trade and investment, [www.bmwi.de/Redaktion/DE/Downloads/E/eckpunktepapier-proposals-for-ensuring-an-improved-level-playing-field-in-trade-and-investment.pdf?blob=publicationFile&v=2](http://www.bmwi.de/Redaktion/DE/Downloads/E/eckpunktepapier-proposals-for-ensuring-an-improved-level-playing-field-in-trade-and-investment.pdf?blob=publicationFile&v=2).

<sup>14</sup> [Proposal for a Union Act submitted under Rule 46\(22\) of the Rules of Procedure on the Screening of Foreign Investment in Strategic Sectors.](http://g8fp1kplyr33r3krz5b97d1.wpengine.netdna-cdn.com/wp-content/uploads/2017/03/2017-03-20-Draft-Union-Act-on-Foreign-Investment.pdf)  
<http://g8fp1kplyr33r3krz5b97d1.wpengine.netdna-cdn.com/wp-content/uploads/2017/03/2017-03-20-Draft-Union-Act-on-Foreign-Investment.pdf>.

<sup>15</sup> European Council conclusions, 22-23/06/2017, [www.consilium.europa.eu/en/press/press-releases/2017/06/23-euco-conclusions/](http://www.consilium.europa.eu/en/press/press-releases/2017/06/23-euco-conclusions/).

<sup>16</sup> More detailed information on the CFIUS review process as well as recent cases can be found at Jackson (2017).

<sup>17</sup> The Nordic countries receive significant amounts of business investment in digital data storage capacity for these reasons.

<sup>18</sup> It will replace the previous Data Protection Directive after a two year transition period in May 2018.

<sup>19</sup> The GDPR is complemented by a proposed ‘Directive on certain aspects concerning contracts for the supply of digital content’ that contains a similar approach with respect to digital content and the European Commission has published a ‘Proposal for a regulation on cross-border portability of online content services’.

<sup>20</sup> Article 20(1) of the General Data Protection Regulation.



[www.oecd.org/investment](http://www.oecd.org/investment)

