

**REPUBLIC OF TURKEY
YILDIZ TECHNICAL UNIVERSITY
THE INSTITUTE OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS
ECONOMICS MASTER'S PROGRAM**

MASTER'S THESIS

**DIGITAL SINGLE MARKET AND DIGITAL
PERFORMANCE OF THE EU**

**SİNEM SAKTAŞ
15729020**

**SUPERVISOR
Assist. Prof. ZEYNEP KAPLAN**

**ISTANBUL
2019**

**REPUBLIC OF TURKEY
YILDIZ TECHNICAL UNIVERSITY
THE INSTITUTE OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS
ECONOMICS MASTER'S PROGRAM**

MASTER'S THESIS

**DIGITAL SINGLE MARKET AND DIGITAL
PERFORMANCE OF THE EU**

**SİNEM SAKTAŞ
15729020**

**SUPERVISOR
Assist. Prof. ZEYNEP KAPLAN**

**ISTANBUL
2019**

REPUBLIC OF TURKEY
YILDIZ TECHNICAL UNIVERSITY
THE INSTITUTE OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS
ECONOMICS MASTER'S PROGRAM

MASTER'S THESIS

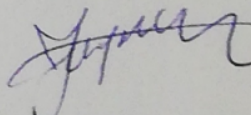
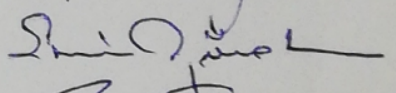
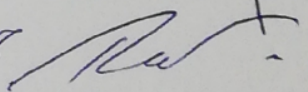
DIGITAL SINGLE MARKET AND DIGITAL
PERFORMANCE OF THE EU

SİNEM SAKTAŞ
15729020

Submission Date: 29.05.2019

Thesis Date: 22.05.2019

The thesis is approved by unanimously

	Title Name Surname	Signature
Supervisor	: Dr. Öğr. Üyesi Zeynep Kaplan	
Jury Members	: Dr. Dr. Emirhan Göral	
	Dr. Öğr. Üy. Rıza Dilek	

ISTANBUL
MAY 2019

ÖZ

DİJİTAL TEK PAZAR VE AB’NİN DİJİTAL PERFORMANSI

Sinem Saktaş

Mayıs, 2019

Son yıllarda dijital ekonominin önemi giderek artmaktadır. AB’de Dijital Tek Pazarı’nı oluşturması gerektiği gerçeğini kabul etmiştir. Dijital ekonomi ülkelerin rekabetedebilirliği için önemli belirliyeciler arasında yer almaktadır. Son gelişmelere paralel olarak AB, kendisini dijital tabanlı bir ekonomiye dönüştürmektedir. Çalışmanın temel amacı, AB’de ve dünyada hızla gerçekleşen dijital dönüşümün incelenmesidir. Çalışma AB Dijital Tek Pazarı’nın gelişim sürecini ele alarak Avrupa ekonomisi için önemi ve katkılarını tartışmaktadır. Bu bağlamda dijital ekonominin temel göstergeleri dikkate alınarak AB Dijital Tek Pazarı’nın performansı karşılaştırmalı olarak ölçülmeye çalışılmıştır. Çalışmada ayrıca AB Dijital Tek Pazarı’nın faydaları ve oluşturulması önündeki mevcut engeller ele alınmıştır. AB Dijital Tek Pazarı’nın iki önemli unsuru olan e-ticaret ve e-ticaretin vergilendirilmesi incelenmiştir. Çalışmada AB tarafından hedeflere ulaşıldığının ancak mevcut engellerin ortadan kaldırılmasına yönelik dijital altyapı yatırımlarına ve AB genelinde yasaların uyumlaştırılmasına daha fazla ağırlık verilmesi gerektiği sonucuna varılmıştır. AB Dijital Tek Pazarı’nın ayrıca üye ülkeler için birçok fırsat sunması beklenmektedir.

Anahtar Kelimeler: Dijitalleşme, Dijital Ekonomi, Avrupa Birliği, Dijital Tek Pazar, E-ticaret.

ABSTRACT

DIGITAL SINGLE MARKET AND DIGITAL PERFORMANCE OF THE EU

Sinem Saktaş

May, 2019

The importance of the digital economy is increasing over the last decades. The digital economy is among the core elements of competitiveness of countries. The EU has also recognized the importance of the establishment of its own Digital Single Market. In line with the recent developments, the EU is transforming itself into a digital-based economy. The main objective of the study is to examine the transformation of the digital economy in the EU and the world. Thus, the study presents the development of the EU's Digital Single Market and discusses its significance and contributions to the European economy. In this context, the study aims to assess the performance of the EU's Digital Single Market by taking into account the main indicators of the digital economy. The study also takes into consideration the benefits of the EU's Digital Single Market and barriers against its completion. E-commerce and taxation of e-commerce which are crucial dimensions of the EU's Digital Single Market are also examined. In order to further develop its Digital Single Market, EU has to focus on the digital infrastructure investments and attempts related to the harmonization of the EU's laws which abolish the barriers against well-performing Digital Single Market. It is expected that the Digital Single Market will offer many opportunities for the EU countries.

Key Words: Digitalization, Digital Economy, European Union, Digital Single Market, E-commerce.

ACKNOWLEDGEMENTS

The completion of this thesis could not have been possible without the supports of my parents. They show to me the meaning of being a family one more time. For this reason I would like to thank to my mother, father, sister and my love. Also, great thank to my supervisor Assist. Prof. Zeynep Kaplan for her academic participations and guidances to write this thesis.

Istanbul; May, 2019

Sinem Saktař

TABLE OF CONTENTS

ÖZ	iii
ABSTRACT	iv
ACKNOWLEDGEMENTS	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
LIST OF FIGURES	ix
ABBREVIATIONS	xi
1. INTRODUCTION	1
2. THE DIGITAL ECONOMY: CONCEPTS, IMPORTANCE AND IMPACTS	3
2.1. The Digital Economy: A Conceptual Framework	3
2.1.1. The Evolution of the Digital Economy: A Theoretical Perspective	7
2.1.2. Industrial Economy versus Digital Economy	10
2.1.3. The Economic Importance of the Digital Economy	13
2.2. The Definition of Information and Communication Technology	14
2.3. The Definition of E-commerce	15
2.3.1. The Major Types of E-commerce Transactions	17
2.3.2. The Benefits and Costs of E-commerce	19
2.3.2.1. The Benefits of E-commerce for Consumers	20
2.3.2.2. The Benefits of E-commerce for Companies	21
2.3.2.3. The Costs of E-commerce for Consumers and Companies	22
2.4. The Macroeconomic Effects of E-commerce	23
2.4.1. The Effects of E-commerce on Economic Growth	23
2.4.2. The Effects of E-commerce on Employment	24
2.4.3. The Effects of E-commerce on Innovations	25
3. THE EU'S DIGITAL ECONOMY: DIGITAL SINGLE MARKET	27
3.1. The Evaluation of the European Union: The Single European Market	27
3.2. Updating the Single European Market: The European Digital Single Market	30
3.2.1. Better Access to Digital Goods and Services across the EU	33
3.2.2. Creating the Right Conditions for Advanced Digital Networks and Innovative Services	36
3.2.3. Creating the European Digital Economy with Growth Potential	37
3.3. The Benefits of the Digital Single Market	37
3.4. The Cost of Non-Europe for Completion of the Digital Single Market	39
4. AN ASSESSMENT OF THE EUROPEAN DIGITAL SINGLE MARKET	41
4.1. The Performance of the Digital Single Market	41
4.1.1. The Internet Access in the EU	41

4.1.2. ICT Access and Usage in the EU.....	45
4.1.3. Human Capital and Digital Skills in the EU.....	52
4.1.4. The Digital Performance Index: DESI and I-DESI.....	56
4.2. E-commerce and Taxation in the Digital Single Market.....	60
4.2.1. Trends and Drivers of E-Commerce in the EU.....	60
4.2.1.1. Trends in E-commerce Transactions in the World.....	60
4.2.1.2. Trends in E-commerce Transactions in the EU.....	62
4.3. The Existing Difficulties in E-commerce in the EU.....	73
4.3.1. The Taxation of E-commerce: VAT Applications in the Digital Single Market.....	76
4.3.1.1. VAT Applications and Origin or Destination Principles.....	78
4.3.1.2. VAT Applications and Mini One Stop Shop.....	79
4.3.1.3. VAT Applications and Distance Selling.....	81
4.3.1.4. VAT Applications and New Legal Provisions.....	83
4.3.2. The Existing Difficulties in Taxation of E-commerce in the EU.....	84
5. CONCLUSION.....	87
REFERENCES.....	90
CURRICULUM VITAE.....	98

LIST OF TABLES

Table 2.1:	The Industrial Revolutions.....	12
Table 2.2:	The Examples of the E-commerce Transactions.....	18
Table 3.1:	The Breakdown of the EU Budget, 2021-2027.....	30
Table 3.2:	The Pillars and Initiatives of the DSM.....	32
Table 4.1:	DESI Classification of the EU-28, 2018.....	58
Table 4.2:	Individuals Who Used Internet and Purchased Online in the EU, 2017, (%).....	63
Table 4.3:	All Enterprises Made E-commerce Sales in the EU-28, 2017, (%).....	69
Table 4.4:	VAT Rates and Distance Selling VAT Thresholds of Selling Goods Online.....	82

LIST OF FIGURES

Figure 2.1:	Scoping the Digital Economy	6
Figure 2.2:	The Benefits of E-commerce for Consumers and Companies.....	19
Figure 3.1:	Major Steps in European Integration towards the DSM.....	29
Figure 3.2:	The Digital Europe Programme, 2021-2027.....	31
Figure 4.1:	Level of Internet Access in Households in the EU, 2010-2017, (%).....	42
Figure 4.2:	Internet Use and Its Frequency by Individuals in the EU, 2010-2017, (%).....	43
Figure 4.3:	Level of Internet Access in Enterprises in the EU, 2010-2017, (%).....	44
Figure 4.4:	ICT Access and Usage by Individuals in the EU, 2010-2017, (%).....	45
Figure 4.5:	ICT Access and Usage by Enterprises in the EU, 2010-2017, (%).....	46
Figure 4.6:	ICT Employment in the Digital Economy, 2011, (%).....	48
Figure 4.7:	Value Added of the ICT Sector in the EU, 2015, (% relative to GDP)...	48
Figure 4.8:	ICT and Business Enterprise R&D Expenditure in the EU, 2014, (%).....	50
Figure 4.9:	Total ICT Goods Exports in the Digital Economy, 2005-2016, (%).....	51
Figure 4.10:	Total ICT Goods Imports in the Digital Economy, 2005-2016, (%).....	52
Figure 4.11:	Digital Skills of the EU Population** in the EU-28, 2017, (%).....	54
Figure 4.12:	Digital Skills of the EU Labor Force in the EU-28, 2017, (%).....	54
Figure 4.13:	ICT Specialists Employed in the EU-28, 2010-2017, (%).....	55
Figure 4.14:	Digital Economy and Society Index (DESI), 2018, (%).....	57
Figure 4.15:	Average Scores for I-DESI in 2016, (%).....	59
Figure 4.16:	Value of E-commerce Transactions in the EU and the World, 2014-2018.....	61
Figure 4.17:	Size of E-commerce by Regions, 2010-2021, (% of GDP).....	62
Figure 4.18:	Individuals Who Sell Online in the EU, 2010-2017, (% of individuals).....	65
Figure 4.19:	Purchased Goods and Services Online by European Consumers, EU-28, 2017, (% of population)	65
Figure 4.20:	E-commerce Sales of All Enterprises, 2010-2017, (% of enterprises)....	67
Figure 4.21:	E-commerce Sales of All Enterprises in the EU-28, 2011-2017, (%).....	68
Figure 4.22:	SMEs and Large Size Enterprises' E-sales in Europe, 2017, (%).....	70

Figure 4.23:	E-sales of SMEs in the EU-28, 2011-2017, (%).....	71
Figure 4.24:	Total Turnover of Enterprises from E-commerce in the EU-28, 2010-2017, (% of turnover)	72
Figure 4.25:	The Share of Enterprises' Turnover on E-commerce in the EU-28, 2010-2017, (% of turnover)	73
Figure 4.26:	Barriers for Cross-border Online Sales intra EU, 2014-2016, (%).....	74
Figure 4.27:	The Perceived Barriers to Buying/Ordering Online intra EU, 2009-2017, (%).....	75
Figure 4.28:	The Perceived Barriers to Buying/Ordering Online extra EU, 2015, (%).....	76
Figure 4.29:	The VAT Collection Mechanism for E-services under Mini One-Stop-Shop.....	80
Figure 4.30:	The VAT Collection Mechanism for Goods under One-Stop-Shop.....	83
Figure 4.31:	Results of VAT Reductions in E-commerce Transactions.....	85

ABBREVIATIONS

AT	: Austria
B2B	: Business to Business
B2C	: Business to Consumer
BE	: Belgium
BG	: Bulgaria
C2B	: Consumer to Business
C2C	: Consumer to Consumer
CY	: Cyprus
CZ	: The Czech Republic
DE	: Germany
DESI	: Digital Economy and Society Index
DK	: Denmark
DSM	: Digital Single Market
EAEC	: European Atomic Energy Community
ECSC	: European Coal and Steel Community
EE	: Estonia
EEC	: European Economic Community
E-GDP	: Electronic Gross Domestic Product
EL	: Greece
EMU	: European Monetary Union
EU	: European Union
ES	: Spain
FI	: Finland
FR	: France
GDP	: Gross Domestic Product
HR	: Croatia
HU	: Hungary
ICT	: Information and Communication Technology

I-DESI	: International Digital Economy and Society Index
IE	: Ireland
IoT	: Internet of Things
IT	: Information Technology
IT	: Italy
LT	: Lithuania
LU	: Luxembourg
LV	: Latvia
MOSS	: Mini One Stop Shop
MT	: Malta
NL	: Netherlands
NO	: Norway
OSS	: One Stop Shop
PL	: Poland
PT	: Portugal
R&D	: Research and Development
RO	: Romania
SE	: Sweden
SEA	: Single European Act
SEM	: Single European Market
SI	: Slovenia
SK	: Slovakia
SMEs	: Small and Medium Sized Enterprises
STEM	: Science, Technology, Engineering and Mathematics
TR	: Turkey
UK	: The United Kingdom
US	: The United States
VAT	: Value Added Tax
www	: World Wide Web

1. INTRODUCTION

Over the last decades, digitalization has been significantly transforming the societies and economies by creating new economic platforms. In this framework, as a result of globalization and improvements in technology, digital economy as a new field of economics has emerged. A well-established digital economy provides market extension, and strengthens the competitiveness of countries in the global market. Countries adopted to digital economy increase their welfare and productivity. Moreover, digital economy makes economies more integrated with each other.

Along with the digital transformation of the world economy, the European Union (EU) is also transforming itself into a knowledge-based economy. Currently, the EU's Single Market provides the free movements of goods, services, capital, and labor but recent developments in the world require the free movement of information and knowledge. This requirement is one of the stimulating factors for the creation of the EU's Digital Single Market (DSM). In the context of European 2020 Strategy, the EU decided to create the DSM to benefit from the opportunities provided by the digitalization and the improvements in Information and Communication Technologies (ICTs), such as the innovative breakthroughs, communication facilities, and economic growth. The EU has published its DSM strategy in 2015 to lay down the objectives on the abolishment of technical and legislative barriers. The DSM strategy consists of three main pillars which aim to provide better access to the digital goods and services across Europe, to create a better environment by developing the European basis for a well-performing digital economy and society, and to maximize the growth potential of the European DSM. In this strategy, it is foreseen that the DSM will increase the EU's GDP by 415 million Euro (or 3% of the EU GDP) per year, and create new job opportunities and reduce unemployment.

The European Commission has taken several measures to improve the functioning of the digital economy for consumers and businesses in some areas such as e-commerce, package delivery, geo-blocking, copyrights, and Value Added Tax (VAT) applications.

Despite several attempts to achieve a well-functioning DSM, the EU's digital market remains fragmented into 28 different national markets, disparities exist between the digital transformation performances of the EU states and the EU lags behind its main competitors in the global digital economy. In this framework, the purpose of this study is to present the development of the EU's DSM and to discuss its performance, importance and contributions to the European economy. Furthermore, this study aims to answer the following research question: What are the major opportunities and challenges of e-commerce transactions and VAT applications as part of the EU's DSM?

The structure of the study is as follows. After a brief introduction, the second chapter deals with the conceptual framework of the digital economy and the necessary requirements for the development of a well-performed digital economy. E-commerce transactions are one of the cornerstones of the digital economy. In this context, the costs and benefits of e-commerce transactions for consumers and companies are discussed in the following sections. The chapter also includes the macroeconomic effects of the e-commerce transactions. In the third chapter, the development of the EU's market integration process and the emergence of the DSM is presented from a historical perspective. In this framework, several attempts and strategies of the EU for increasing the efficiency of the DSM are discussed. In the fourth chapter, the digital performance of the DSM both at the national and the EU level is analyzed by using several digital performance indicators in order to present the digital performance of the EU states. Moreover, global leading countries such as Asia-Pacific countries and the US are analyzed compared to the EU's digital performance. This section also focuses on the e-commerce transactions and VAT applications at the EU level. In this framework, VAT applications such as One Stop Shop (OSS) and Mini One Stop Shop (MOSS) systems applied for goods and e-services respectively are presented. Additionally, the strong and weak sides of the European VAT system in e-commerce transactions occur among the EU and non-EU countries are discussed. And the final section concludes.

2. THE DIGITAL ECONOMY: CONCEPTS, IMPORTANCE AND IMPACTS

Digital economy which provides efficiency and productivity has a significant importance for countries across the world. Moreover, its importance has been continuously increasing as a result of the fast pace of globalization, the improvements in technology and the facilitation of accessing new technologies. In this section, the concept of digital economy will be discussed in detail. Additionally, the concepts of ICT and e-commerce which have a great importance in the digital economy will be examined.

2.1. The Digital Economy: A Conceptual Framework

Digitalization has been significantly transforming the societies and economies over the last decades. Digitalization is transforming the industries and creating new economic platforms. Nowadays, almost all sectors became digital such as e-services, e-education, e-health and e-government. Digitalization of the economy has gained momentum as a result of these improvements in services. Furthermore, new services are emerging in the economy due to the increase of technological needs.

The digital economy as a new economy appeared by the forces of globalization and improvements in the ICT which have a significant role in the digitalization process. The digital economy makes the economies more integrated with each other by abolishing the barriers between consumers, enterprises, retailers and competitors. This situation shows that physical national borders are no longer a barrier in accessing to the knowledge. Every economy needs an information infrastructure that is managed by national or institutional authority to boost the system and, every organization has to use this information infrastructure for the system to work well.

Besides these developments, there is still not a consensus about the definition of the digital economy in the literature (Degryse, 2016). However, there are some common

characteristics of the digital economy that can be collected from various definitions of some scholars and economic platforms in the relevant literature.

The digital economy was first defined by Don Tapscott in 1994. In his study, *The Digital Economy: Promise and Peril in the Age of Networked Intelligence*, Tapscott explained the digital economy in an indirect way. According to Tapscott, the digital economy is the Age of Networked Intelligence which is not simply about the networking of the technology but about the networking of humans through technology and is not an age of smart machines but of humans who through networks can combine their intelligence, knowledge, and creativity for breakthroughs in the creation of wealth and social development (Tapscott, 2014, xii).¹

Lane (1999) defines digital economy as the convergence of computing and communication technologies on the internet that results in the flow of information and technology that fosters e-commerce, new competitive strategies and vast organizational change (Lane, 1999, 317). Similarly, British Computer Society (2013) indicates that the digital economy is an economy that is based on digital technologies, although it is increasingly perceived as conducting business through markets based on the internet and the World Wide Web (www).

Besides the above mentioned definitions of the digital economy, according to Brynjolfsson and Kahin (2000) digital economy refers specifically to the recent and still largely unrealized transformation of all sectors within the economies by the computer-enabled digitalization of information. They add that in line with a long-term trend towards market liberalization and reduced barriers to trade, the emergence of digital economy makes commerce less local, more inter-state, and, especially more global. This characteristic of the digital economy is based upon the e-commerce and allows market integration by bringing more consumers together with more suppliers from all over the world.

Additionally, OECD (2012) consider the concept of the digital economy as an umbrella term that is used to describe markets based on digital technologies which involve the

¹ For more details about the themes of digital economy, see; Tapscott (2014), page; 54-90.

exchange of goods and services through e-commerce. Also, they consider digital economy as a vital sector and its expansion has been a key driver of economic growth in recent years. Moreover, the shift towards a digital world has had crucial impacts on the society that extend far beyond the digital technology context alone.

According to the European Commission (2014) digital economy is the result of the transformational effects of new General Purpose Technologies² in the fields of ICT sector, impacting all sectors of the economy and society: retail, transport, financial services, manufacturing, education, healthcare, media etc.

Similarly, Deloitte defines digital economy as an economic activity that results from billions of everyday online connections among people, businesses, devices, data, and processes. In this context, they add that the backbone of the digital economy is hyperconnectivity which means growing interconnectedness of people, organizations, and machines that result from the internet and the mobile technology (Deloitte, [05.08.2018]).

Furthermore, Mesenbourg (2000) explains that the digital economy has three primary processes. These processes are e-business infrastructure (e.g. supporting e-business process and conducting e-commerce), e-business processes (e.g. how business is conducted), and e-commerce transactions (e.g. selling of goods and services online). E-business infrastructure as a part of the total economic infrastructure is an infrastructure which enables supporting e-business processes and conducting e-commerce. E-business is any process conducted over computer-mediated networks while e-commerce is the value of goods and services sold over computer-mediated networks (Mesenbourg, 2000, 3).

As stated by Mutula (2010, 29) the digital economy consists of various components, which includes government policies and regulations, electricity infrastructure, telecommunication industry, internet, information and knowledge management systems, research and development (R&D), human capital and knowledge workers, digital service providers, e-commerce industry, and emerging technologies.

² General Purpose Technologies such as steam engine, electricity, ICTs and etc refer to changes which transform both the daily life and the structure of the economy (Strohmaier, 2014, 2).

According to Bukht and Heeks (2017), the digital economy is classified by three stages such as core, narrow and broad scope. Figure 2.1 provides this classification. The core and narrow scopes are based on the IT and ICT producing sector and their infrastructure systems. The broad scope is based on the use of digital devices for accomplishing activities such as e-business, e-commerce, automation, the sharing economy, gig economy which refers flexible labor who prefer temporary contract rather than permanent one, such as freelancer, and online labor platforms (UNCTAD, 2017).

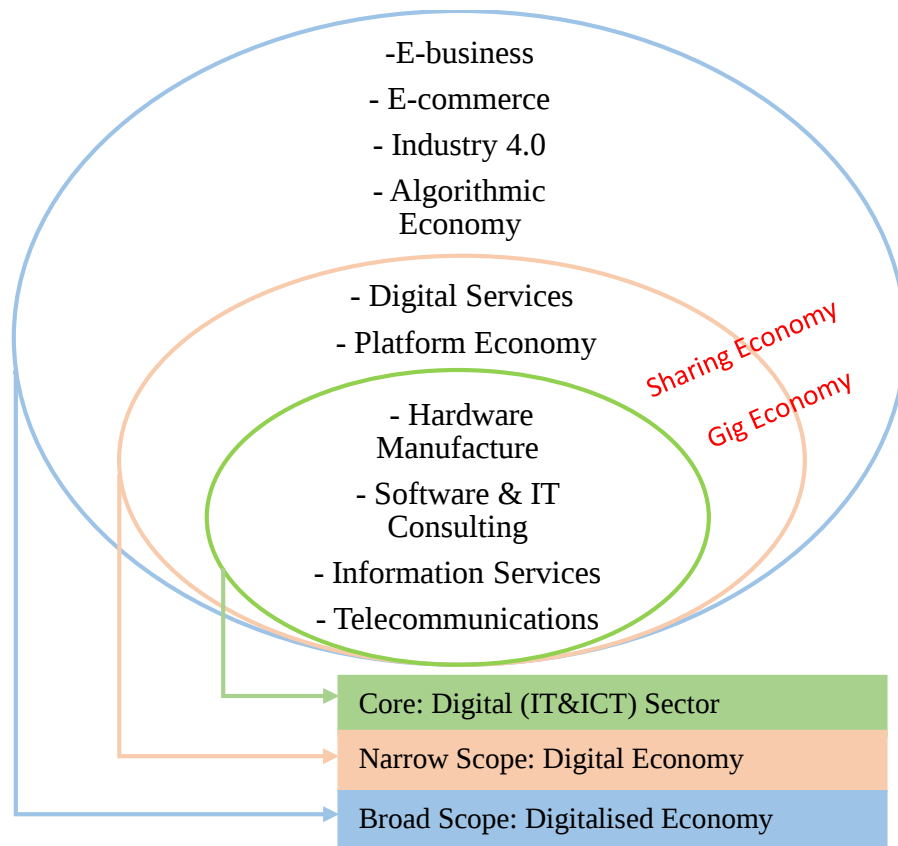


Figure 2.1: Scoping the Digital Economy

Source: Adapted from Bukht, Heeks. (2017). **Defining, Conceptualising and Measuring the Digital Economy.** Development Informatics Working Paper Series Paper No. 68. Manchester: Centre for Development Informatics Global Development Institute, SEED, p. 13.

To sum up, all definitions focus on the similar points. Digital economy is altering the trade functions and has its own mechanism. This mechanism creates new trade relations while eliminating the old relations at the same time. Besides these effects, digital economy

requires continuous technological improvements and investments in ICTs which is the main force behind the creation of digital economy.

Another focus is based on the economic effects of the digital economy on productivity, economic growth and development. The study will examine these economic effects in following sections.

2.1.1. The Evolution of the Digital Economy: A Theoretical Perspective

The factors of production used in the economy are key drivers in explaining the economic success of a country. Especially, the factor of technology which directly affects the productivity should be examined along with the other production factors such as labor, capital, land, and entrepreneurship. As it is known, technology is the knowledge of production and it is required to produce goods and services. Recently, knowledge factor is more advantageous than other factors of production such as labor and capital. In the digital economy, labor is the qualified brain power and physical capital is the fixed investment for R&D. Knowledge is not a scarce resource and its value is continuously increasing. Thus, it provides competitive advantages for countries in the global competition. Therefore, understanding the importance of knowledge and technology has been the subject of economics.

The knowledge economy is a branch of economics and it examines the economic structure of the information society. According to Leadbeater (1999), the knowledge economy is about a set of new sources of competitive advantage. The emphasis is put on the ability to innovate and creating new products and markets, as well as exploiting the creation of new markets. The applicability of knowledge economy to all industries such as high-tech and low-tech, manufacturing and services, retailing and agriculture is also emphasized.

Over the last decades, the economics of technology and innovation and economics of knowledge have emerged as a significant area of the explanation of economic theories. They affected the creation of *new economy* also known as *the digital economy*. The economy has been transformed from the agricultural economy to industrial economy and towards the digital economy. This transformation is considered as a result of structural

changes in global demand and production. Thus, the rapid changes in consumption habits and the requirement to meet this demand caused the transformation to digital the economy.

This study examines the evolution of the economy from a historical perspective. There are three important approaches of economics which are the Classical approach, the Schumpeterian approach, and the Arrovian approach (Antonelli, 2008). These approaches make it possible to investigate the economics of knowledge and economics of technology and innovation.

The Classical approach has been favorable in understanding the effects of innovations and technological changes on economic growth, primary at the aggregate level. The Schumpeterian approach provides a relationship between innovation and competition in the market in terms of the firm theory. Furthermore, Schumpeterian theory explains the term known as “creative destruction” to clarify this relationship. Finally, the Arrovian approach explains the economics of knowledge with its additions for the theory of organizational and regional economics (Antonelli, 2008).

The Classical approach which is represented by Adam Smith is based on the law of the supply and demand. According to Smith, there is an invisible hand which always provides an equilibrium in the economy. Another important focus of Smith is based on the economic growth. According to Smith, economic growth is a result of an increase in the division of labor and, specialization of the labor force. The term specialization refers to the concentration of the economic actors in the different stages of production and, it is necessary for the creation of the innovations. Innovations raise the productivity of labor and, this increased productivity provides the market extension. According to Smith, market extension is limited by the demand. For example, if the demand is high for a product, it means, the production of this product will be high. Thus, producers will decide to increase the scale of production. Finally, cost of production will decrease and price will be cheaper. All these situations will lead to an increase in the division of labor and, the market extension. The technological changes increase the number of goods produced as well as the division of labor. In other words, technological knowledge and technological changes are attributed to the division of labor in the Classical approach (Eecke, 2013).

Another important economic approach is the Schumpeterian approach. His contribution is a focal point at the heart of the economics of innovation. The Schumpeterian approach puts firms and entrepreneurs at the center of the economic growth. This approach is based on three ideas. The first idea is based on the innovations which provide long-run growth. These innovations include the process innovations which increase the productivity of production factors, product innovations which refers to the creation of new products and, organizational innovations which make the combination of production factors more efficient. Second idea is the innovations result from investment such as research and development, or investments of firm in skills. This idea focuses on the importance of the knowledge economy (Aghion, Akcigit 2015). Third and the most important contribution of Schumpeter is the ‘creative destruction’. Creative destruction expresses a shift from the old innovations to the new innovations. In other words, the new production methods take place of the old ones. There is a strict conflict between old and new innovations however, this conflict creates the economic growth. The firm invested in new innovations has a competitive advantage with regard to firm use the outdated innovation.

Technological innovations and the economic changes cannot be explained separately. They are the two significant and inseparable characteristics of creative destruction in understanding the economic growth and development. According to Schumpeter, innovations directly influence the competition in the economy because they have a distinctive feature. Competition among firms is an impetus to introduce innovations. Additionally, introduction, adoption and the diffusion of the innovations take an important place to provide competitive advantage for firms, rather than the adjustment of price and quantity.

Finally the last approach is the Arrowian approach which is represented by a neo-classical economist Kenneth Arrow. His approach is based on the knowledge and the learning process. Arrow (1961) set up an economic model in his work “The Economic Implications of Learning by Doing” where he presented the knowledge as a production factor. According to Arrow (1961) knowledge is the basic element for the increase of efficiency and economic growth and it is the product of experience. Moreover knowledge is an incentive for the production of technology. Every economic system would devote its

resources to the production of new knowledge to increase efficiency. Arrow explained the economic features of the experienced knowledge from an economic viewpoint (Antonelli, 2008). Each experienced knowledge provides an efficiency in production. For instance, each new machine produced and used affects the learning process and changes the environment where production takes place. Each new production technique is the result of a technological change, thus, technological change requires a continuous learning. Furthermore, continuous learning creates continuous productive efficiency, thus, economic growth and efficiency are achieved automatically (Arrow, 1961).

2.1.2. Industrial Economy versus Digital Economy

While industrial age begins with the emergence of Industrial Revolution, the digital age begins with the Digital Revolution. It is clearly observed that the world economy is changing from industrial economy which depends on steel, machines etc. towards the digital economy which is based on computers and networks. The digital economy is based on knowledge. The ability to make use of knowledge is a crucial factor in the process of increasing productivity and prosperity.

Digital economy has its own dynamics and drivers such as production factors and production methods. Thus, the production method of the industrial economy and the digital economy differs from each other. For instance, the production costs, produced goods and services, and the price were used to be the most competitive factors. Still, companies benefit from these factors in the digital economy, however, the most important and competitive key driver is the knowledge in the digital economy.

In the digital economy, brainpower is preferred more than muscle force and the mode of organization is based on intellectual labor. In recent years, businesses around the world focus on the intellectual assets and, move towards developing new methods for their intellectual capital, in other words, for the intellectual labor. In the digital economy the intellectual labor is preferred while in the industrial economy the physically productive one is preferred. In industrial economy, human capital is almost equivalent and interchangeable with each other, but, in the digital economy, this situation is not the same.

The need for labor force and the nature of work in the digital economy are substantially different. The function of work and labor are changing dramatically. Moreover, the intellectual capital becomes much more precious than the productive one in industrial economy. Because the labor in the digital economy create more value compared with the labor in the industrial economy. The number of labors involved in agricultural and industrial economy has been decreasing over the last decades, since the digital economy provides more attractive opportunities, such as high paid and high value jobs.

Additionally, the other key factor of the digital economy is innovations including production method and marketing. Innovations encourage the most competitive and productive practices in manufacturing. Manufacturing system has been constantly transforming from pre-industrial economy to digital economy, as a result of creative innovations. At the beginning, in the pre-industrial economy, the amount of produced goods was small, and often unique. Steam engines, electricity, and computers were discovered as a result of continuous transformations in innovations, and, the number of produced goods increased. Next, the software system is developed, and mass manufacturing has transformed into the additive manufacturing such as robotics and 3D Printers or scanner (Achilleopoulos et al, 2015). Furthermore, digital production method has been going far beyond industrial production method, and these innovations provide more advantages in terms of economic growth by providing productivity. Table 2.1 briefly categorizes the industrial revolutions from the first industrial to the fourth industrial era. The table also demonstrates the prominent technological and digital transformations throughout the centuries.

Table 2.1: The Industrial Revolutions

Industrial Revolution	Period	Transformation and Breakthroughs
1th Industrial Revolution	18 th century	From mostly agriculture based economies to industrial economies. Steam engine, iron works, textile industries
2nd Industrial Revolution	Since 1870	Expansion of pre-existing industries and new ones, steel, oil, electricity Mass production, internal combustion engine, telephone, light bulb
3rd Industrial Revolution	Until now	From analogue electronic and mechanical devices, to digital technologies. Microchips, PC, ICT, World Wide Web
4th Industrial Revolution	Currently	Builds on the Digital Revolution, New ways to embed Technology. Robotics, artificial intelligence, nanotechnology, biotechnology, IoT, 3D Printing.

Source: Körner, Kevin, Marc Schattenberg, Eric Heymann. 2018. **Digital Economics: How AI and Robotics Are Changing Our Work and Our Lives**. Deutsche Bank Research. EU Monitor. May 14. Germany, p.3.

As shown in Table above, the Industry 4.0 refers to the fourth Industrial Revolution. The 3rd Industrial Revolution (Industry 3.0) refers to the automation of single machines and processes, while the 4th Industrial Revolution refers to the digitization of organizations such as manufacturing, logistics and services, and integration into the digital ecosystem with value chain partners (Geissbauer, Vedso, Schrauf, 2016).

Fourth Industrial Revolution provides beneficial opportunities for digital transformation by evolving technologies such as big data analytics, artificial intelligence and the internet of things (IoT), and blockchain technology (ADB, UNESCAP, 2018, xiii). Furthermore, all these new technologies which are related to the wave of Industry 4.0 also shape and develop a strong digital ecosystem supporting e-commerce.

2.1.3. The Economic Importance of the Digital Economy

The economy has been changing rapidly. Recently, this change has been accelerated by the influence of the digital economy. Thus, economic rules and dynamics are being rewritten. The internet and technology are increasingly influencing the daily life. Consequently, companies around the world are among the first economic actors to adopt this new context. Each company must know all the tools offered by the digital economy and review all conditions required for business digitalization. Adaption of digital technologies by companies is the significant determinant to increase their growth. The classic market conditions are no longer exist since everything takes place around the internet for companies, including the trade in goods and services. As a result, if companies want to keep their businesses alive, they need to adopt new economic changes.

The digital economy is the crucial factor for competitiveness, growth and development, and it holds a great potential also for the small and medium sized enterprises (SMEs). In the digital economy, SMEs take the advantage of economies of scale and better access to resources as much as large companies. Indeed, SMEs can benefit from digital technologies, such as better access to skills, talent or markets, better collaboration and communication, or greater access to new technologies and applications (OECD, 2018, 12). As it is known, reduced costs, increased productivity, access to the new markets, savings from increased productivity, and specialization result from technological changes, and access to the new strategies to increase sales create the economies of scale. Thus, the digital economy enables all businesses including the SMEs to benefit from such positive effects.

The digital technologies has strengthened the understanding that the data is at the center of the digital economy and represents a great importance for innovation and growth. Digital economy allows to produce innovative outputs with datasets. *Data-driven innovation* is a new economic term which refers to the production of innovative outputs from datasets. Indeed, a huge amount of datasets are becoming key assets for companies to create competition and foster new products and processes (OECD, 2015).

Collecting information and creating datasets about the customers are an important process for increasing the efficiency and creativeness of the companies. Companies can create

new data-sets or develop current data-sets through the digital economy. Moreover, companies optimize their processes and create new value for customers as a result of data analytics and the spread of cheaper and more compact hardware technologies.

Internet and the customer experiences are inseparable terms, because the most of the company and customer activities are on the internet which is the best platform for accessing the data. Recently, the number of companies which base their activities on the consumer experience are increasing. This concept has become a significant element for companies that aim to improve their business performance, continuously. In this respect, one of the most famous company is Amazon. If a customer buys a product on Amazon, Amazon evaluates this selling process to collect information from several aspects such as packaging, quality of production, and relation with supplier.

From another respect, many digitalized companies use online platforms like social media to collect information from members of social media. Companies suggest differentiated products based on the features of specified potential customers considering the collected information. A particularity of the information collected from the social media is that it can be accumulated and used infinite number of times. Moreover, this information is produced, processed and managed exactly like real goods, or they became economic goods and allows a continuous growth of know-how.

2.2. The Definition of Information and Communication Technology

ICT refers to the technologies that ensure access to information via telecommunications. While information technology (IT) is the technology allows accessing information sets via software, hardware and networking, ICT focuses on communication technologies which include technological devices such as phones and computers that provide flows of information (ICT, [11.09.2018]). Basically, IT is an umbrella term which includes ICT. The most important characteristics of ICT is that they allow richer, faster, and flexible communications by enabling control at a distance and reach all economic production chains from final goods and services to raw materials (Sharafat, Lehr, 2017, 5).

ICT has become a significant part of the economy. Currently, almost all consumers and businesses use internet and computers to take economic advantages over the world.

Developing new products and marketing them is easier and faster than past as a result of technological innovations. In this case, ICTs which allow consuming fewer resources, investing less capital expenditure, and creating new jobs opportunities, are the key drivers for economic growth (Sharafat, Lehr, 2017, 5). On the one hand, increased ICT diffusion affects economic growth from three different channels by fostering the technology penetration and creation of the new innovations, promoting the quality of the decision making-process of economic actors, decreasing the costs of production and increasing demand for goods and services, outputs level (Vu, 2011). Moreover, ICTs promote economic growth by increasing the flexibility in production, the number of various goods and services, the consumer welfare with lowered prices, and expanding international trade across the world (Sharafat, Lehr, 2017, 6).

The analysis of the ICT and its services has also a critical importance in understanding the efficiency of e-commerce. According to Kumar, Arif and Malik (2014), e-commerce industry is dependent on ICT in terms of its operations. This situation leads to the fact that the definition of e-commerce and ICT are inseparable. Also, this definition could be extended to refer e-commerce as an application of ICT in business and commerce.

The development of e-commerce is considerably based on the improvements in ICT infrastructure. ICT allows the facilitation of e-commerce activities such as e-payments and e-security, to create a successful communication network between customers and companies. It is clearly obvious that the lack of ICT infrastructure negatively affects the e-commerce, international trade and economic growth.

2.3. The Definition of E-Commerce

E-commerce is the abbreviation of Electronic Commerce and it is a form of online commerce in which the purchase and sale is made via Website. According to the European Commission (1997), e-commerce is about doing business electronically, and it is based on the electronic processing and transmission of data, including text, sound and video. The study also indicates that the e-commerce covers a wide variety of activities such as electronic trading of goods and services, online delivery of digital content, electronic fund transfers, electronic share trading, electronic bills of loading, commercial auctions, collaborative design and engineering, online sourcing, public procurement, direct

consumer marketing and after-sales services. It involves both products (e.g. consumer goods, specialized medical equipment) and services (e.g. information services, financial and legal services); traditional activities (e.g. healthcare, education) and new activities (e.g. virtual malls) (European Commission, 1997, 2).

E-commerce has two common classifications. The first classification is based on the nature of the commodities involved in commercial transactions and, the second classification is based on the different nature of the subjects involved in the transactions. This section focuses on the first classification based on the nature of commodities. The second classification will be focused in the following section.

The first classification, it is based on distinguishing the nature of the commodities involved in transactions such as direct and indirect e-commerce. Direct e-commerce refers to online transactions, which is based on the supply of online goods and services such as e-books, music, and computer programs. In this respect, purchased goods and services are transferred to the customer by the computer system itself. For instance, an Italian customer buys an application for smartphone online from a Turkish supplier, in this case, ordering, payment, and delivering of this product occurs online. Indirect e-commerce refers to both traditional and digital trade channels. In this framework, purchased goods and services are delivered using the traditional physical distribution channels. The ordered goods are delivered to the customer with traditional channels, while, payment can be made either directly at the time of order electronically (e.g. credit card or the other electronic payment systems) or upon delivery. For example; a French customer buys a cover for smartphone online from the USA, in this case, delivering of this product occurs in traditional way, but, the payment could be made online or cash on delivery.

To summarize up, e-commerce presents considerably possible advantages for consumers and companies, particularly for the SMEs. Its rapid applicability is an inevitable advantage for economic actors, industries, and governments. E-commerce makes trade possible at lower costs across national and international frontiers. For a well-established e-commerce, the development of efficient distribution channels and qualified logistic networks are necessary for the physical delivery of products that are ordered electronically.

2.3.1. The Major Types of E-commerce Transactions

The objectives and motivations of technological innovations promote companies to do business online. There are four different types of e-commerce and, they are characterized by two different parties. This section examines the various types of e-commerce based on the parties.

There are significant distinctions between the various forms of e-commerce which are based on the economic actors involved such as consumers and businesses. The consumer is one side of the commercial transaction who acts for personal purposes unrelated to do business, craft or professional activity that may be carried out. The business is the other side of the commercial transaction which acts for commercial purposes such as doing business, or professional activity, or intermediary. The distinction between the consumers and businesses is not related to the technology or platform used, but the qualifications of those who sell and buy. E-commerce involves both businesses and consumers and, in the process of e-commerce, the focus shifts from one to another. Therefore, it is possible to classify e-commerce from Business to Business, Business to Consumer, Consumer to Consumer and finally Consumer to Business.

(i) Business to Business (B2B): It identifies a commercial transaction which takes place between two companies. In addition to selling products and services online, businesses can use the web to strengthen relationships with industrial customers. In other words, B2B is a kind of e-commerce in which both the seller and the buyer are professionals.

(ii) Business to Consumer (B2C): This is a transaction which takes place between the company and the final customer. There are virtual stores in which there are catalogs and price lists freely accessible by the site visitors. This process is accompanied by detailed and updated information. In other words, B2C is a kind of e-commerce in which the seller is a business operator, e.g. a professional, while the buyer is a consumer. B2C e-commerce is the most common type and occurs when a consumer makes an online purchase on a platform.

(iii) Consumer to Consumer (C2C): C2C e-commerce is a kind of e-commerce in which both seller and buyer are the consumers. E-commerce is becoming an increasingly

popular approach along with the growing presence of sites that manage online auctions. In C2C type of e-commerce, there is a need for another third party which is an intermediary. For example, second-hand sites such as eBay, gittigidiyor.com and sahibinden.com provide such services. Moreover, in C2C transactions buyers not only get information about the products but also determine the price.

(iv) *Consumer to Business (C2B)*: C2B e-commerce occurs between consumers and business organizations. In this type of transaction, consumers offer to sell goods and services to businesses and determine the price, besides businesses decide whether or not to accept the consumer's offer.

Table 2.2. The Examples of the E-commerce Transactions

How?			What	Side	Example
Digitally Ordered	Platform Enabled	Digitally Delivered			
Y	N	N	Good	C2B	A consumer in France purchases online a Persian carpet from a supplier in Iran.
Y	Y	N	Service	C2C	A consumer in Turkey rented a house online (e.g. AirBnB) from the other consumer who is located in Japan for holiday in Canada.
Y	N	Y	Service	B2B	A dancing school in Spain purchased an accounting program online, directly a website of a supplier in Ireland.
Y	Y	Y	Good	B2C	A consumer in Italy purchases a movie online from a supplier in India, via a website which is located in different places (e.g. Netflix).
Y	Y	N	Good	B2B	A software company in Sweden orders display cards online from a supplier in the USA, via Amazon.
N	N	Y	Service	B2C	A consumer in Greece purchase a travel ticket via telephone from an agency in Turkey. The ticket is delivered electronically to the consumer.

Source: Adapted from the OECD 2017. **Measuring Digital Trade: Towards a Conceptual Framework**. Paris: OECD Publishing, p. 9-10.

Table 2.2 provides several cases about goods and services which are subject to e-commerce transactions occur between consumers and businesses. These transactions have been categorized by how they are ordered, enabled and delivered. Digital order refers to an order which occur via a website, while digital delivery refers to a delivery which occurs online. Platform enabled system do not requires a specific location for ordered goods and services. Moreover, the digital transactions which occurs via a platform enabled system

between a consumer and a supplier could occur in three different ways. They are the transactions based on domestic goods and services provided by the foreign online intermediary, transactions based on foreign goods and services provided by the foreign online intermediary, and transactions based on foreign goods and services provided by the domestic online intermediary. Some of the most important companies which provide such services to consumers are Amazon, AirBnb, Uber, Netflix and Spotify (OECD, 2017).

2.3.2. The Benefits and Costs of E-commerce

E-commerce sites represent opportunities both for the company that relies on e-commerce and consumers. However, the advantages and disadvantages of e-commerce revealed that there are two sides of a coin. The following section examines the advantages of e-commerce sites for companies, and the opportunities for the consumers.

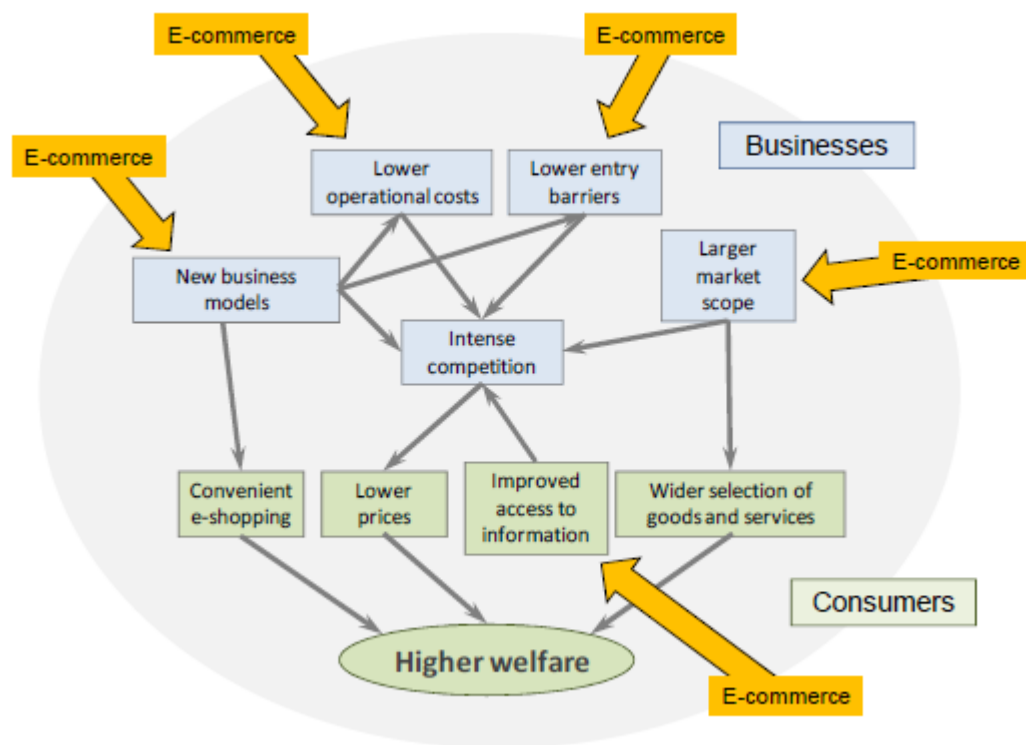


Figure 2.2: The Benefits of E-commerce for Consumers and Companies

Source: OECD. 2013. **Electronic and Mobile Commerce**. Paris: OECD Publishing, p.15.

Figure 2.2 summarizes the benefits of e-commerce for consumers and companies and analyzes these benefits from microeconomic aspects. All these benefits such as lower

operational costs and entry barriers, and lower prices and convenient e-shopping, etc. mutually affect the consumers and companies and create higher welfare.

2.3.2.1. The Benefits of E-commerce for Consumers

The growth in the number of purchases via the internet is dramatically increasing. This section first lists the reasons that facilitate e-commerce for consumers and next deals with the benefits offered to buyers.

One of the most important benefits of e-commerce is the price competitiveness. It is usually possible to find goods and services online at more competitive prices than the retail market when the consumer compares prices with each other.

Another important positive outcome of e-commerce is that it allows the collection of information and makes a comparison. For example, there is a consumer who has willingness to buy a television. Before buying a television, this consumer can compare the prices, quality, functions and models of the same product from different channels. The consumer can easily inquire and compare products and services with a few clicks, through information sheets with detailed descriptions. Exhibition and marketing of products online (e.g. a company's online catalogs) are important drivers for e-commerce.

E-commerce also provides purchasing flexibility. This is based upon the idea that consumers can consult the list of goods and services and proceed with the purchase at any time, without limitations of days and hours. The fourth benefit of e-commerce is that multi-device usability. This situation enables accessing the e-commerce sites from different channels and facilitates purchasing.

Additionally, another benefit of e-commerce is the convenience in receiving the goods. All e-commerce sites permit consumers to choose the most convenient place for sending the goods. Some of the biggest e-commerce operators in the market give the opportunity to receive the goods personally at collection points in all main cities.

Further, benefit of e-commerce for consumers is the existence of diversified payment methods and security systems. Cash on delivery, bank transfer, credit cards, PayPal account are the main payment methods accepted by the vast majority of e-commerce sites. All banking and transition systems aim to ensure maximum security and confidentiality

of data. Besides, benefit of e-commerce is providing the right of withdrawal to consumers in transactions. According to the law, consumers can take the advantage of the right of withdrawal with regard to online purchase. Moreover, e-commerce sites provide a legal guarantee for products sold by e-commerce are fully included in the warranty.

The last benefit of e-commerce is the feedback. Before the beginning to the online purchase, the consumer tends to consult the opinions of other buyers and takes them into account for the decision-making process. Most of e-commerce sites provide this opportunity which makes the e-commerce more effective for consumers.

2.3.2.2. The Benefits of E-commerce for Companies

Companies tend to reduce business costs, increase the productivity and maximize their benefits. The creation of e-commerce sites requires fewer investments in comparison with the physical stores and, having an electronic store represents great opportunities. This section explains the main benefits of e-commerce for sellers of online good and services.

Firstly, e-commerce ensures the minimum operating costs and high trade volumes for companies. The transformation of an e-commerce company's structure is easier than the transformation of a physical company's structure. Thus, an e-commerce company takes less risk and becomes less vulnerable to a possible change, transformation or a new demand in the market compared to a physical company which may meet such risks. Furthermore, an e-commerce company has a continuous consumer potential since it can easily adapt to changes such as the shifts in customer preferences.

Additional benefit of e-commerce for firms is the dropshipping agreement. The existence of dropshipping agreements eliminates the warehouse requirement for some e-commerce companies. This kind of agreement requires collaborating with one or more than one supplier. In this case, e-commerce companies can electronically integrate the stock system of the supplier to their own stock system. This situation decreases the stock costs and creates a competitive advantage for companies.

Another important positive benefit of e-commerce for the firms is that every company can access the global market by opening a virtual shop. Furthermore, reducing the costs is possible by the opening of an online store, compared with the physical store. Even if a

company has a physical store, opening an e-commerce site is a good advertising tool which allows increasing sales and efficiency of the existing facilities.

Next, important benefit for companies is that e-commerce allows collecting information online about consumers. Thus, analyzing the consumer experience in the online store is being possible. For example, some information can be collected such as the numbers of visits of consumers, point of connecting, number of time spend searching for information and goods.

The next benefit of opening an e-commerce site is that there is no need for an intermediary. Direct selling of goods and services decreases the cost of distribution. This situation allows offering products at a lower price.

2.3.2.3. The Costs of E-commerce for Consumers and Companies

The previous section deals with the benefits of e-commerce for both consumers and firms. However, there are costs of e-commerce as well as its benefits. Analyzing the benefits and costs of e-commerce is crucial and useful in understanding its efficiency. This section highlights the costs of e-commerce.

A weak point in e-commerce is the lack of physical contact with the product before the delivery. Thus consumers cannot try products before buying. Touching the goods and testing them are the great advantages of physical stores. In addition to this factor, there is also the distance from the sales staff, the purchase is made alone, so the company cannot entice the consumer during the purchase.

Furthermore, the consumer cannot leave the store with the product but also waits for the purchased product technically longer. Moreover, the customer or the company bears the shipping costs. The lack of trust is another critical factor which affects the use of e-commerce platforms. Consumers have limited trust in e-commerce platforms and online payment tools.

Another important factor is the shipping times. Large e-commerce companies are more successful in delivering the consumers' online orders in a very short time but SMEs generally cannot compete with the big companies. This situation often creates a big problem for SMEs and causes dissatisfaction of many consumers.

Another cost of e-commerce is the taxation. E-commerce enables to trade in an environment in which technological developments abolish the national barriers. However, the facilitation of trade via e-commerce arises the problems about tax measurement and influences the current international tax regimes. These difficulties occur in tax collection, tax revenue, tax declaration, and different national tax laws, determining the subjected country of tax, and tax frauds. Countries deal with e-commerce has been publishing strategy plans which challenge such difficulties in taxation.

2.4. The Macroeconomic Effects of E-commerce

E-commerce allows the efficient use of resources in both developed and developing countries. The ability of the developing countries to benefit from such opportunities depends on the elimination of legal and institutional barriers to e-commerce. Developed countries, notably the US and the EU, have a leader position in e-commerce in comparison with developing countries.

The development trend of e-commerce cannot precisely be defined since it is a new concept in the economy. Therefore, measuring the macroeconomic impact of the e-commerce is difficult (IMF, 2018). Despite this difficulty, e-commerce is spreading rapidly while influencing the social and economic life all over the world.

2.4.1. The Effects of E-commerce on Economic Growth

The contribution of e-commerce to the economic growth is a good determinant in measuring the success of the digital economy. E-commerce has a significant importance in the digital economy, raises the performance of the companies, promotes consumption, and positively affects economic growth. E-commerce, one of the most crucial extension of digital economy, offers some economic opportunities for both consumers and companies, such as lower prices and reduced costs by increasing productivity. E-commerce is a substantial determinant to increase productivity and economic efficiency because it decreases the costs of economic actors with improvements in technology and consequently affects economic growth positively. These improvements in ICTs and e-commerce make the country's economies more integrated with each other and also create

socio-cultural interaction. Furthermore, international trade is influenced positively as a result of improvements in e-commerce.

On the one hand, as a result of international trade, while consumers can access a vast amount of goods and services, companies can access a vast amount of suppliers. On the other hand, while customers' needs increase, correspondingly companies' needs increase to meet this demand (Liu, 2013, 81). For instance, customers would like to go to other countries or buy domestic products from these countries to satisfy their cultural needs. In this way, these consumers could buy travel tickets and reserve a place or could buy goods and services online. Such activities which are also the benefits of e-commerce, increase the production and efficiency and consequently economic growth.

In addition to the online accessibility to goods and services without any limits such as time and place, diversity of electronic devices increases the efficiency of e-commerce. An increasing number of accessible goods and services mean more consumption, and this situation stimulates the economic growth. On the other hand, the spread of e-commerce increases the demand for electronic devices which provide purchasing online. Finally, both of these situations create economic growth, mutually.

Another important effect of e-commerce is in investments. Currently, e-commerce companies have to provide ordered goods and services to the consumers in the specified place and time. For successful e-commerce transactions, investments in transportation and telecommunication infrastructure are required. According to Liu (2013) in order to meet the transportation demands required by the rapid development of e-commerce is likely to lead to a corresponding increase of government procurement in this area. Additionally, increased advertising investment demand result in increased investments in the advertising sector. Thus, all these investments affect the economic growth and development, directly.

2.4.2. The Effects of E-commerce on Employment

Throughout the new economic transformation, quality and quantity of workforce required have been changing in many employment areas. E-commerce causes the decreases in the number of workers who are required to operate businesses. Changes in the way of doing

business and, changes in the efficiency of customer services have direct impact on the number of employee required. Although e-commerce firms employ fewer workers, they prefer to employ high-skilled workers.

Developments in ICTs increase the productivity overall the economy. In addition to these developments, ICTs and e-commerce are altering the way of doing business in all sectors, including the services sector which provides outsourcing where e-commerce provides trading of these outsourcing services. Increased productivity and decreased costs also enable an increase in the number of companies which benefit from services provided by other companies. Furthermore, this increase encourages the establishment of new companies and consequently, the creation of new job opportunities. The current position of technology allows companies to work independently from a specific location. Companies easily can benefit from external labor markets through the digital economy. Thus, firms can participate in the global market by taking advantage of diversified skills of labor markets, both domestically and internationally (United Nations, 2002, 21).

Development of e-commerce and its effects also generate some changes on employment and wages. E-commerce creates new job opportunities both in direct and indirect way, as well as causes job losses. On the one hand, new jobs areas which allows production of goods and services online are created such as software, hardware and cloud services (direct job creation). On the other hand, other jobs are created as a result of increased demand and productivity in these new job areas (indirect job creation). Furthermore, traditional jobs are lost correspondingly when e-commerce occupies the traditional way of business, such as retail sector, travel agencies (United Nations, 2002).

2.4.3. The Effects of E-commerce on Innovations

ICT becomes a focus for the most countries in the last two decades. Global economic activities have been altered by internet and e-commerce as well as improvements in IT. The spread of low-cost ICTs, particularly the internet, accelerates the convergence process by facilitating cross-border information flows and coordination of economic activities (Kraemer, et.al 2006).

General opinion about the activities of e-commerce mostly focuses on the shopping experience rather than payments experience. E-commerce also stimulates the innovations in the payment activities as much as innovations in shopping activities. Changes in lifestyle are altering shopping behavior of consumers. People prefer to be faster and more effective in shopping activities. As a result, the demand for new payment channels is increasing. The demand for new payment channels which would make e-commerce faster and effective also causes an increase in inventions in the banking sector. These channels such as e-money and e-payment are the results of increased investment volume of ICT in the banking sector (Lupu, Mual, Stiphout, 2016).

On the one hand, e-commerce creates new service companies such as PayPal, PayU, Skrill, Braintree. On the other hand, the existence of these new payment channels requires the digital security systems for purchases online. Consequently, e-commerce increases the needs to develop technological innovations since it has great impacts on both banking and security systems.

3. THE EU'S DIGITAL ECONOMY: DIGITAL SINGLE MARKET

The recent debate on digital economy has been on the top of the agenda in many countries in the world including the EU. Among the most important reasons for the growing interest in the digital economy is its future and yet unknown long term impacts on the economy and the society. The EU has also recognized the importance of the issue to benefit from the ongoing digital transformation of the economy.

3.1. The Evolution of the European Union: The Single European Market

The economic and political integration efforts in Europe took off in 1950s to end conflicts and secure long lasting peace across the continent. The European Coal and Steel Community (ECSC) as the first step towards the European integration were established by six countries in 1951. Seven years later, in 1957, the Treaty of Rome was signed by the founding six that established the European Economic Community (EEC) and European Atomic Energy Community (EAEC). The goal of economic integration constituted the main focus of the Treaty of Rome. One of the main aims of the EEC was the creation of a common market which was based on the free movement of factors of production across Member States.

The European integration showed rapid progress toward a common market by the gradual establishment of the customs union between 1958 and 1968 (Sapir, 2011). With the completion of the customs union in 1968, all customs tariffs subject to trade were eliminated between the EU Member States and a common external tariff was set on imports from outside the EU (About the Customs Union, [13.04.2018]). However, limited progress was made in the 1970s in establishing the next step, the common market.

The Single European Market (SEM) programme was formally launched in 1985 with the European Commission's White Paper on Completing the Internal Market. The White

Paper addressed three specific barriers to completion of the SEM, namely physical, technical and fiscal barriers and included 300 proposals that would simplify and speed up the legislative process. The idea of completing the common market was signed the following year as the Single European Act (SEA) in 1986. SEA presented political and institutional reforms to the supranational institutions to complete the SEM by end 1992. The SEA defined the SEM as an “area without frontiers in which the free movement of goods, persons, services and capital is ensured”. The aim was to take the EU beyond just being a custom union toward becoming one market where there is free mobility of factors of production (Archer, 2008). The purposes of this integration project were to improve the economic performance of Europe, increase competition within the unified market and reduce trade costs. As the SEM launched it also started to affect various policy areas such as employment, transportation, investments, research and development, regional development, agriculture, competition and external relations.

As an expansion of the single market, the formation of the European Monetary Union (EMU), represents a further major step in European integration process. The first step toward a single currency was undertaken when the European Monetary System was established in 1979. Later in 1992, the EU laid the foundations for a single currency with the Maastricht Treaty. Starting from 1990s the EMU was completed in three stages. In 2002, the Euro replaced national currency in 12 countries. The number of countries use the Euro has expanded from the original 12 since its introduction. Currently, while 28 members of the EU take part in the SEM, 19 countries adopted the single currency Euro. Closer economic and monetary cooperation has always been crucial for the SEM to develop further. In this framework, the single currency Euro provides several benefits that would make the SEM more efficient.

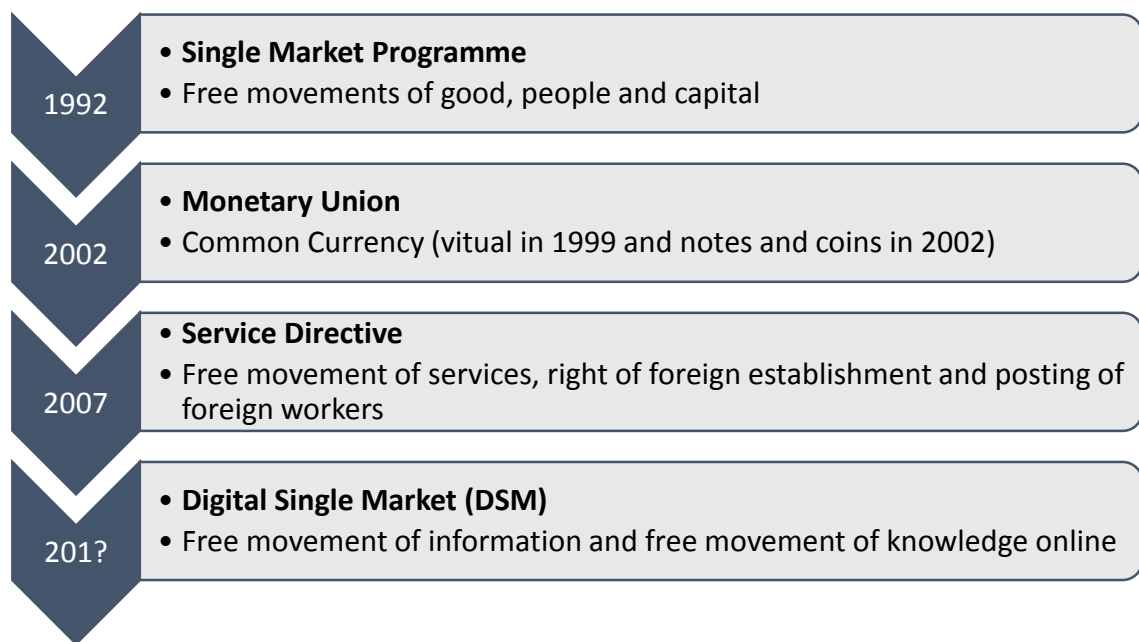


Figure 3.1: Major Steps in European Integration towards the DSM

Source: European Policy Center. 2010. **The Economic Impact of a European Digital Single Market.** Brussels, p.12.

As the importance of the digital economy increases, there is an essential need for the free movement of information and free movement of knowledge in the digitalized economy. For that reason, EU has many attempts on the creation of an updated or digitalized form of the SEM, thus the DSM. Figure 3.1 shows the major steps in European integration process that paved the way for the completion of the DSM. According to the European Policy Center (2010) DSM is considered as the fourth wave of integration initiative of the EU. Following the completion of the Single Market Programme in 1992, establishment of the EMU and the introduction of common currency Euro in 2002 and introduction of the Services Directive which aims to prevent businesses discriminating against customers based on nationality or place of residence in 2007, the establishment of a single unified market for digital goods and services may be regarded as the fourth and currently the final stage of the EU. Fostering growth, jobs and innovation have been the main motivation for the formation of the above mentioned initiatives. The DSM which ensures the free movement of information and knowledge could bring further benefits to European consumers and businesses.

3.2. Updating the Single European Market: The European Digital Single Market

One of the main aims of the EU is to create a common market where goods, services, capital and labor move freely. Over the years the EU made several attempts to update its common market. In this framework, one of the latest and the most important attempt of the EU has been the formation of the European DSM which is an extensive form of the SEM. European Commission (2015c) defines DSM as “an area in which the free mobility of goods, services, persons and capital is ensured and where consumers and businesses can seamlessly access and exercise online activities under conditions of fair competition, and a high level of consumer and personal data protection, irrespective of their nationality or place of residence”. Achieving a well-functioning DSM ensures that the EU maintains its position in the digital economy, and allows European companies to grow globally (European Commission, 2015b). Lower prices, better services, creation of new employment opportunities and new resources are targeted within the DSM. According to the European Commission (2015c), when completed the DSM could create an additional contribution to European GDP by 415 billion Euro per year. This contribution comprise of 204 billion Euro from e-commerce, 158 billion Euro from the sharing economy, 47 billion Euro from the cloud computing, and 6 billion Euro from other components of the digital economy (European Parliament, 2017).

Table 3.1 The Breakdown of the EU Budget, 2021-2027

	Billion Euro
Regions, Cohesion Fund, Social Fund	374
Agriculture and Maritime Policy	365
Neighborhood and the World	123
Research and Innovation	103
European Administration	85
Strategic Investments (without digital)	38
Migration and Border Management	35
Erasmus+	30
Security Defense	28
Economic and Monetary Union	25
Digital Infrastructure + Digital Europe	12
Others	61
Total	1279

Source: Adapted from; Heyman, Eric, Kevin Körner. 2018. **Digital Infrastructure: Bottlenecks Hamper Europe's Progress**. Deutsche Bank Research. EU Monitor. October 12. Germany, p.19.

The EU has several budget programs for funding the European economy that include a budget for the digital infrastructure and digital Europe. Table 3.1 provides the breakdown of the multiannual financial framework for 2021-2027. According to the Figure, the digital infrastructure and digital Europe's share in the EU budget is 12 billion Euro and it comprised of 9.2 billion Euro for digital transformation of the European society and economy and 3 billion Euro for digital infrastructure. In addition, Figure 3.2 demonstrates the Digital Europe Programme which includes the breakdown of the funding of the EU's digital transformation. According to the Figure, the budget for digital transformation of the European society and economy comprised of 0.7 billion Euro for advanced digital skills, 1.3 billion Euro for digital transformation and interoperability, 2 billion Euro for Cyber-security and trust, 2.5 billion Euro for artificial intelligence and 2.7 billion Euro for high performance computing (Nortvedt, 2019, 25). The share of the digital infrastructure and digital Europe is only 1% of the total EU budget which amounts 1,279.4 billion Euro (European Commission, 2018b).

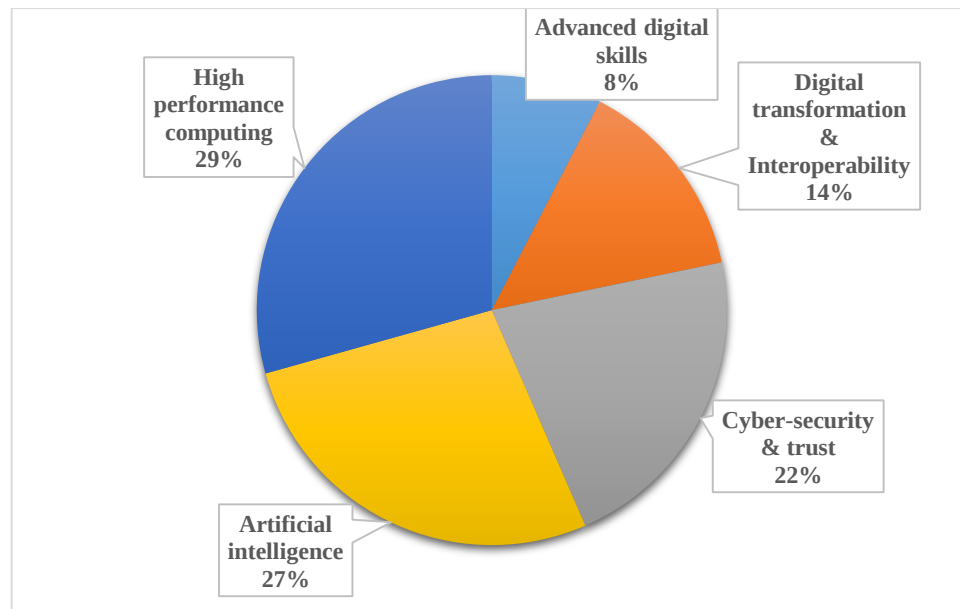


Figure 3.2: The Digital Europe Programme, 2021-2027

Source: Nortvedt, Thomas. 2019. **A Digital Single Market?** Cullen International. 14 March 2019. European Commission. Brussels, p.25.

European Commission launched the DSM Strategy for Europe on 6 May 2015 (European Commission, 2015a). The Strategy recommends three pillars and 16 initiatives that aims to remove existing online barriers that arose from different national legal and technical

regulations and maximize the current opportunities provided by DSM. Indeed, for a well-established DSM, the abolishment of the technical and legal barriers is an essential requirement. Table 3.2 presents the actions and the timetable of the pillars and initiatives proposed by DSM strategy.

Table 3.2: The Pillars and Initiatives of the DSM

Actions	Timetable
Better access for consumers and business to digital goods and services across Europe	
Legislative proposals for simple and effective cross-border contract rules for consumers and businesses	2015
Review the Regulation on Consumer Protection Cooperation	2016
Measures in the area the parcel delivery	2016
A wide ranging review to prepare legislative proposals to tackle unjustified Geo-blocking	2015
Competition sector inquiry into e-commerce, relating to the online trade of goods and the online provisions of services	2015
Legislative proposals for a reform of the copyright regime	2015
Review of the Satellite and Cable Directive	2015/2016
Legislative proposals to reduce the administrative burden on businesses arising from different VAT regimes	2016
Creating the right conditions for digital networks and services to flourish	
Legislative proposals to reform the current telecoms rules	2016
Review the Audiovisual Media Services Directive	2016
Comprehensive analysis of the role of platforms in the market including illegal content on the internet	2015
Review the e-Privacy Directive	2016
Establishment of a Cybersecurity contractual Public-Private Partnership	2016
Maximizing the growth potential of the Digital Economy	
Initiative on data ownership, free flow of data (e.g. between cloud providers) and on a European Cloud	2016
Adoption of a Priority ICT Standards Plan and extending the European Interoperability Framework for public services	2015
New e-government Action Plan including an initiative on the ‘Once-Only’ principle and an initiative on building up the interconnection of business registers	2016

Source: European Commission. 2015b. **A Digital Single Market Strategy for Europe**. SWD (2015) 100 Final. Brussels, p.20.

The DSM strategy is an important step for the completion of the DSM, and focusses on three important pillars (European Commissions, 2015c, 3).

Access: First of all, DSM strategy aims at better access to digital goods and services across Europe for consumers and companies.

Environment: The second focus of the DSM strategy is to improve the European basis for the digital economy and the creating the right conditions, and environment for the digital transactions.

Economy and society: The third focus of the DSM strategy is to maximize the growth potential of the digital economy and improving the ICT infrastructures such as Cloud computing and Big Data.

3.2.1. Better Access to Digital Goods and Services across the EU

DSM creates opportunities for consumers and businesses, while the fragmented structure of the European market hinders them to take advantage of these opportunities for accessing the goods and services in the digital context. Hence, in the DSM strategy, great importance is attached to the creation of the common reliable e-commerce rules, affordable cross-border delivery systems, copyright rules, and the prevention of geo-blocking, and the reduction of VAT related burdens in all EU markets.

E-commerce has an important place in the DSM, since it allows both consumers and businesses to benefit from a large variety of goods and services with lower prices in cross-border transactions. However, the participation rate of consumers and especially small companies in cross-border e-commerce are low due to the complex, unclear and different national rules applied in Member States. The existence of 28 different national protection and contract laws discourage companies from cross-border trading and hinder the consumers benefit from competitive offers. For a well-functioning e-commerce environment in the EU, there is an essential need for the harmonization of consumer and contract laws which are related to the selling and purchasing of goods and services online (European Commission, 2015b). In addition, regulatory differences between each Member States are not only limited to contract law but also contain different technical specifications or rules such as labeling and selling arrangements where the EU consumer

is located. These differences in regulations require that the supplier has to adapt its products and packaging accordingly to the regulations of the consumer Member State. This complex legal situation causes that the businesses need to know and comply with 28 different sets of national regulations, and also, creates significant information and compliance costs for many online suppliers, especially for the SMEs (European Commission, 2015c). According to the European Commission's DSM Factsheet of 6 May 2015, SMEs face 9,000 Euro extra costs for adapting to the national laws annually, and only 7% of SMEs could participate in cross-border sales as a result of this compliance cost. It is expected that, the cross-border e-sales and participation rate of SMEs in the DSM would increase 57% if the rules would be common in all EU states. Thus, the existence of effective common rules in all European market would encourage economic actors who want to engage in cross-border e-commerce.

E-commerce transactions and deliveries have been considerably increasing day by day. Thus, affordable cross-border delivery system is required for efficient e-commerce transactions. However, some obstacles are observed in international delivery of goods and services in the EU. The cross-border e-commerce is negatively influenced by the lack of affordable and high-quality delivery services. Some of the obstacles for consumers and e-retailers are excessive costs, the lack of transparency, high prices of delivery for small shipments, the lack of convenience for the final consumer and the lack of interoperability between different operators typically involved in a delivery of a cross-border shipment (European Commission, 2015c, 18). In addition, the high price of deliveries is the first and most important obstacle for cross-border e-commerce. The other problems mentioned by the online buyers are long delivery times, non-delivery and/or wrong product delivery. Considering the facts above, achieving market opportunities and increasing the efficiency of the digital market is possible with the introduction of new regulations for efficient delivery system which encourages economic actors, increases the performance of e-commerce activities and also creates consumer trust when they shop online.

Another crucial focus in better accessing to digital goods and services is the preventing the unjustified geo-blocking. "Geo-blocking refers to practices used for commercial reasons by online sellers that result in the denial of access to websites based in the other

Member States” or causes the consumers canalized to a local website with different prices or different goods or services (European Commission, 2015b, 6). Geo-blocking creates territorial restrictions which make consumers dissatisfied on their e-commerce activities, and causes the fragmentation of the market (European Commission, 2015b). European Commission made arrangements to preclude and abolish the restrictions about geo-blocking in cross-border sales and online shopping on 28 February 2018 (European Commission, 2018a). These arrangements aim to give consumers and businesses more opportunities in the EU market. The Geo-Blocking Regulation 2018/302 focuses on the problems related to the unjustified geo-blocking and other forms of discrimination in the cross-border e-commerce transactions. The Geo-Blocking Regulation consists of three components which are related to the problems about the selling of goods and services, the accessing to a website and the accessing to the payment channels (European Commission, 2018a, 8). Problems arise from the selling of goods and services are about the delivery of physical goods, the sale of electronically supplied services and the sale of services provided in a specific physical location. In such cases, consumers are entitled to be treated in the same way as local consumers.

Better accessing to the digital content and reforming the European copyright framework is another curial focus. Copyrights enable right holders to control the use of their works and other protected material and receive money as a result of their use. Copyrights are the form of exclusive rights, to authorize or prohibit the making and distribution of copies as well as communication to the public (Copyright, [22.02.2019]). Increase in internet usage and commonly use of almost all fields by people also requires the harmonization of EU copyright rules to digital area. Abolishing the existing barriers to access copyright-protected services is one of the main requirements for better access to digital goods and services. For instance, when consumers want to access these copyright-protected services which are supplied in another Member State in the EU, they encounter problems arising from different national copyright rules. This situation is generally related to the territoriality of copyright. Furthermore, the restrictions of accessibility also result from business decisions taken by distributors, or from contractual restrictions between rights holders and distributor. (European Commission, 2015b, 7).

Reducing VAT related burdens and obstacles are another requirement to access to the digital goods and services across the EU. In the EU, the VAT rates vary in every Member State between 17% and 25% on sales. One of the most important problems is the calculation of the VAT rate. The existence of 28 different VAT rates creates difficulties in cross-border sales. Since 2015, critical country for calculating the VAT rate in cross-border sales is the place where consumer is located, rather than where the supplier is stayed. This means that the suppliers have to charge the VAT rate of the other Member State where the consumer is located. However, in contrast to this, there is an import exemption for non-EU suppliers. For example, online purchased goods from a third country are not the subject of the VAT. This right gives a competitive advantage to suppliers from third countries against the European competitors. European Commission has been taking several measurements for solving the problems arising from fragmented VAT regulations since 2015. New measurements have been abolishing confuses about the taxation place, and also categorizes VAT regulations in three stages in terms of the supplied goods, services and e-services.

3.2.2. Creating the Right Conditions for Advanced Digital Networks and Innovative Services

A well-performing DSM must be built upon trustworthy, affordable and effective network services, and has to ensure data privacy and protection. This situation requires a dynamic and competitive telecoms sector to fulfill the necessary investments such as Cloud computing, Internet of Things or Big Data tools (European Commission, 2015b, 7).

Telecommunication sector is changing structurally as a result of advances in digital technologies. For that reason, it is a good step to enhance the telecom sector to provide high-performance in the EU. However, some problems still exist because of isolated national markets, even today. Other problems result from the lack of regulatory consistency across the EU, particularly for radio spectrum, and lack of sufficient investment in rural areas (European Commission, 2015b, 9). The debates of the European Commission on Telecom Single Market package which would abolish obstacles in the telecom sector is still ongoing. European Commission expects that Telecom Single Market package will provide harmonized and clear rules for DSM. In addition, the EU

aims to make the telecom rules fit for purpose and to strengthen trust and security in digital services and administration of personal data.

3.2.3. Creating the European Digital Economy with Growth Potential

Digitization of all sectors is a crucial requirement for maintaining the EU's global competitiveness by using developed digital technologies. Big Data and Cloud Services are important for the competitiveness of the EU. The usage of cloud computing by enterprises is increasing day by day. According to the Eurostat, usage of cloud computing services increased from 19% to 21% between 2014 and 2016. The European Commission aims to increase cloud computing usage to 40% by 2020. In addition, the value of data economy is rising, and it is expected to increase to 739 billion Euro by 2020 which represents 4% of the EU's GDP (European Commission, 2017a).

The European Commission published mid-term review of its Digital Single Market Strategy on 10 May 2017. The review outlined three main areas which focus on promoting the European data economy, overcoming cyber security challenges, and promoting fairness of online platforms for maximizing the growth potential of the DSM (European Commission, 2017a). In addition to these developments, the other proposals which guarantee digital growth and new opportunities in the EU are still on progress and under discussion by the European Commission which encourages a rapid adoption of these legislative proposals (European Commission, 2017a, 1).

3.3. The Benefits of the Digital Single Market

One of the purposes of the DSM is to make international trade easier, especially for SMEs, and provide better access to the digital goods and services. The DSM has been continuously developing since 2015 and has a great potential for consumers, enterprises, and public sector. According to the European Commission estimates, DSM could contribute 415 billion Euro per year to the EU's GDP, and could create thousands of new jobs. DSM allows consumers to reach a vast amount of suppliers within the EU and around the world.

One of the main focus areas of the DSM is the e-commerce. DSM allows consumers and businesses to reach a wider variety of goods and services online with lower prices, and

increases price competition. “Moreover, it allows businesses to benefit from cross-border e-commerce by exploiting economies of scale that reduce costs, increase efficiency and promote competitiveness, thereby improving productivity” (Johansson, Lundblad, 2015, 10). Especially for SMEs, reducing the cost of cross-border trade makes them more competitive and productive as a result of lower production cost. Additionally, DSM may affect the productivity and efficiency of enterprises by extending the customer base.

DSM allows consumers to increase their welfare by buying online. The most important determinant for e-commerce for consumers is the prices. Most e-commerce companies offer lower prices for online rather than offline. Prices and lower transaction costs are the main drivers for online purchasing, and also, the wider variety of goods and services motivate the consumers to buy online.

Furthermore, DSM has been boosting the investments in ICTs. ICTs are the crucial key drivers for increasing productivity and making the economies more digitalized. Increased ICT investments encourage new companies and increase the number of enterprises which make e-commerce.

Another benefit of the DSM is its significant effect on employment. The development of the DSM creates different employment fields and new job opportunities for the EU citizens. A well-employed DSM leads to a shift in employment structure towards high-skilled jobs.

Other benefit of the DSM is on the public sector. DSM increases the effectiveness of the public sector by investing in e-government, e-health, and e-education. Public sector can decrease the management cost as a result of such improvements in digital services. Furthermore, “the quality and user-satisfaction associated with public services increases since users perceive interaction with public sector as being easier, faster and more successful” (European Policy Center, 2010, 40).

3.4. The Cost of Non-Europe for Completion of the Digital Single Market

Although the DSM provides several benefits, there are some challenges for the completion of the DSM. This section discusses the existing challenges of DSM arising from the non-fully harmonized European market in some areas such as the absence of common payment and delivery system.

A study by Paczynski (2014) on the cost of non-Europe in the DSM, classified the existing costs in four different categories. The first cost is about the difficulties of resolving uncertainty in the transactions occurring between two Member States. In this context, consumers and businesses do not freely intend to enter in a contract because of the responsibilities and obligations which are arising from the existence of different national contract regulations. The second cost attributed to the costs of cross-border trade. These costs arising from the different national features (e.g. language, culture) of Member States, and from formal barriers as the absence of an effective delivery system which works in whole Europe. Such factors of the cross-border transactions play an important role on the economic actors' decisions whether to sell or purchase. The third cost is related to the costs of seeking redress or justice, and the fourth costs are the costs arising from the limited competition in the DSM. Such costs are related to the market which has many limits on the creation of the fair competition. The lack of fair competition creates some disparities among competitors, and makes relatively bigger companies more competitive with respect to the smaller ones. Thus, increasing the market prices becomes easier on behalf of the larger companies with their market power. Such barriers create large costs for consumers and also for companies.

Paczynski (2014) does not only focuses on the above mentioned costs but also categorizes the costs of specific challenges which are related to the main requirements for the completion of the Single Market. They are the costs arising from uncompleted EU market in cloud computing, postal and parcel delivery services, and payments.

Cloud computing services costs: Cloud computing is one of the main drivers of the digital economy, as well as data. Storage of data has crucial importance as a result of the continuously usable characteristic of data and requirement for continuously accessing it. For that reason, cloud computing plays an important role in improvement of the DSM,

and it brings many benefits for both consumers and businesses in the European digital market. But, the absence of common cloud services and existence of the EU-level legislative gaps does not allow consumers and firms to benefit from the digital economy.

Payment services costs: Payment is the transfer of money or quasi money between economic actors used in transactions. Transformation of the payment systems is an inevitable requirement in the digital economy. Improvements in ICT have accelerated the transformation of the payment system. Along with the expansion of e-commerce, e-payment services in Europe are also improving as a result of digital transformation. While better conditions for e-commerce encourages economic actors to sell and purchase online, e-commerce transactions requires fast and convenient payment channels. However, the current e-payment systems have some obstacles in cross-border transactions. E-payment systems still require standardization measures among Member States. After the completion of standardized e-payment system, consumers would be willing to buy goods and services online in cross-border transactions, and this will increase the efficiency of the DSM. The absences of a common payment system in whole Europe for online transactions create costs for DSM by discouraging economic actors to sell or buy online cross-border commerce.

Postal delivery services costs: Postal delivery services are crucial for a well-functioning e-commerce. However, the EU lacks a common postal service. Costs of delivery differ from one Member State to another in cross-border transactions. Delivery costs are usually higher than the national shipment costs. For instance, shipping of a product to Italy may be cheaper from Finland than from France, irrespective of distance. Thus, the price differentials create difficulties in e-commerce within the DSM. The European Commission has several attempts which address the development of interoperability, the enforcement of the competition law, the introduction of policies to reduce structural entry barriers and price regulation on cross-border delivery to overcome such difficulties.

4. AN ASSESSMENT OF THE EUROPEAN DIGITAL SINGLE MARKET

The EU laws give free mobility rights to people and enterprises to trade and work anywhere in the EU. Moreover, internet and technology abolish the borders between countries and facilitates almost all transactions related to trade by providing efficiency. The EU has published the Digital Agenda for taking all these advantages further in May 2010. The Digital Agenda is one of the seven pillars of the Europe 2020 Strategy and its main objective is to develop the DSM in order to generate sustainable and comprehensive growth in Europe by 2020 (Europe 2020 Strategy, [23.01.2019]).

4.1. The Performance of the Digital Single Market

The following section aims to demonstrate the success of DSM by using several indicators such as internet use, ICT and e-commerce statistics in the households and enterprises level in Europe between the period 2010 - 2017. The study covers the reference years due to the absence of comprehensive data before this period. Moreover, it aims to demonstrate whether the EU has achieved its objectives. The section also focuses on the obstacles such as taxation subject to e-commerce transactions.

In the following sections, official statistics of Eurostat, UNCTAD, and OECD on the digital economy and society reflect the actual state of the EU's digital market and e-commerce performance. Additionally, a number of visual figures which are obtained from the same sources allow the comparisons between the digital performances of the EU Member States within the DSM.

4.1.1. The Internet Access in the EU

The digital connectivity and digital activities are crucial for the measurement of DSM's success. Furthermore, the internet access has significant feature as much as digital connectivity and digital activities, since the quality of the digital connectivity is one of the key determinant for the internet access.

According to Eurostat, as of 2017, the level of internet access in households and enterprises are 87% and 97% respectively. Considering the EU's population, more than 400 million people in the EU³ have internet access. Moreover, the share of households with internet access increased by 17% in the last seven years. On the one hand, the largest share of households with access to the internet in 2017 was recorded in Netherlands (98%) and in Denmark and in Luxembourg (97%). Other four Member States which are Sweden, Finland, the United Kingdom and Germany are presented by 95%, 94%, 94%, 93% respectively. Northern European countries have the leader position for internet use and are followed by Western European, Central European, Southern European and Eastern European countries. Bulgaria has the lowest rate at 67%, followed by Greece at 71%. Turkey has a higher level compared with the other Member States (e.g. Bulgaria, Greece, Croatia, Cyprus, Latvia, Lithuania, Portugal and Romania), however it is below the EU average.

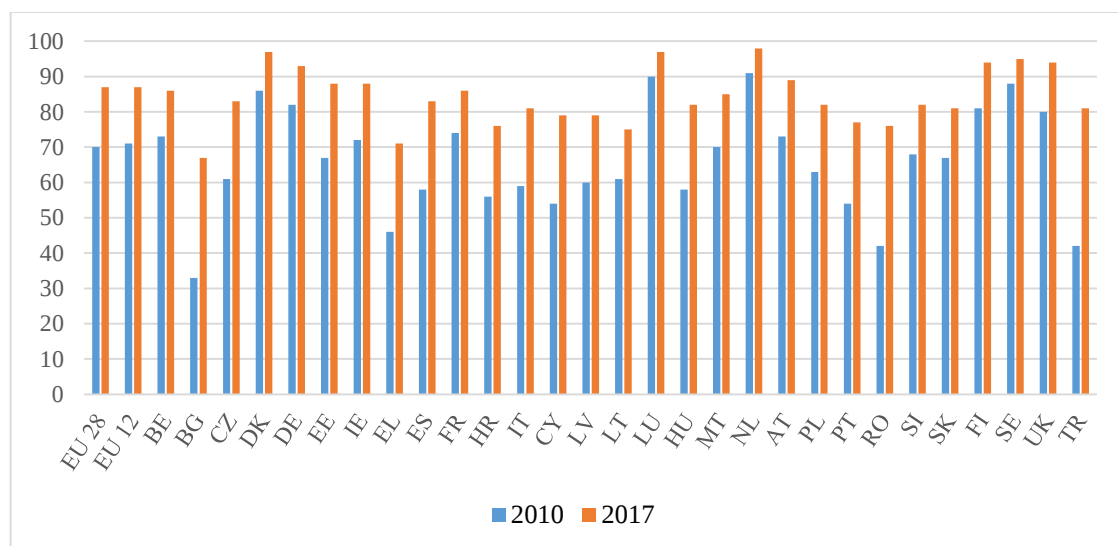


Figure 4.1: Level of Internet Access in Households in the EU, 2010-2017, (%)

Source: Eurostat. 2018a. **Households- Level of Internet Access.** [isoc_ci_in_h] [15.05.2018].

Figure 4.2 shows internet use by individuals between 2010 and 2017, and frequency of internet use in 2017. As shown in Figure, there is a considerable increase in internet use by individuals from 68% to 84%. The EU average of the frequency of internet use was

³ On 1 January 2018, the EU's population is 513 million. https://ec.europa.eu/eurostat/statistics-explained/index.php/Population_and_population_change_statistics. [05.04.2018]

recorded at 81% in 2017. The lowest internet use by individuals was in Bulgaria (63%), in Romania (64%) and Turkey (65%) in 2017. However, Norway –as a non-EU country- has the highest internet use by individuals (98%) in the same year. The largest share of internet use by individuals is recognized in Luxemburg and in Denmark (97%) among the EU Member States followed by Sweden (96%) and the UK (95%). Linear fluctuating trend is observed between the internet use by individuals and its frequency. In other words, almost all internet potential access is used by individuals in Europe.

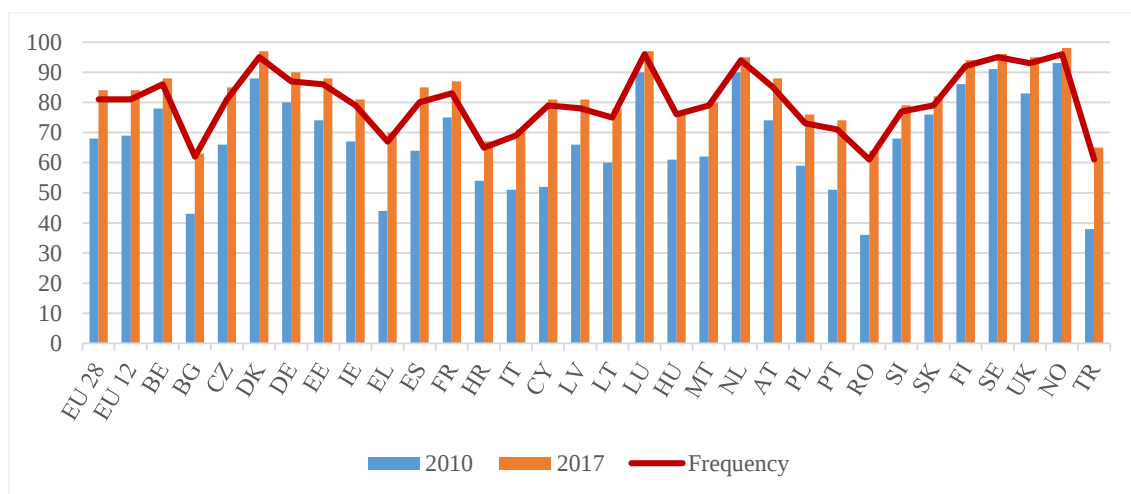


Figure 4.2: Internet Use and Its Frequency by Individuals in the EU, 2010-2017, (%)

Source: Eurostat. 2018b. **Individuals- Internet Use.** [isoc_ci_ifp_iu]; * Eurostat. 2018c. **Individuals-Frequency of Internet Use.** [isoc_ci_ifp_fu]. [16.05.2018].

Besides, the level of internet access in enterprises increased from 94% in 2010 to 97% in 2017 in the EU. Figure 4.3 shows that the internet access in enterprises has been continually increasing since 2010. The share of enterprises with internet access is the highest rate at 100% in Belgium, Denmark, France, Lithuania, Luxemburg, Netherland, Austria, and Finland in 2017. In the same year, the figure for Turkey was 96%. The lowest internet access in enterprises is in Romania (85%) and in Greece (87%). Figure 4.3 shows that the difference between EU-12 and Turkey is 2%, and the difference between Turkey and the EU-28 is 1% in 2017.

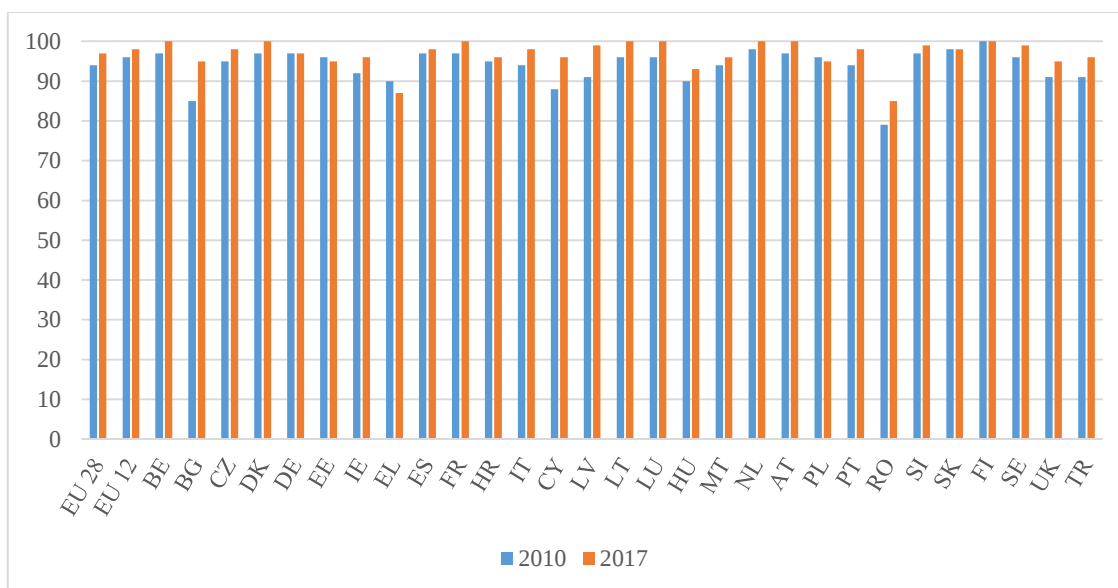


Figure 4.3: Level of Internet Access in Enterprises in the EU, 2010-2017, (%)

Source: Eurostat. 2018b. **Internet Access.** [isoc_ci_in_en2]. [15.05.2018].

EU countries performed well in internet use by individuals and enterprises between 2010 and 2017. Almost all Member States progressed in their digital transformation process. Indeed, the EU countries encourage the digital transformation of the EU and attach great importance to the use of internet services in their economies. Especially, the Netherlands, Denmark, Finland, Sweden, and Luxembourg have highest share of internet use by individuals and enterprises. These countries have more advanced digital economies among the EU Member States because they provide more incentives and investments for the development of the digital economy. Especially, the provided incentives for internet access and broadband services which are crucial for the digital transformation of the society and economy also accelerate the development of citizens' digital skills. Thus, their citizens and labor are also more digitally skilled compared to the other Member States.

However, Romania, Bulgaria and Greece have the lowest internet access by individuals and enterprises in the EU. The main challenges of these countries in internet access by individuals and enterprises are related to the relatively higher fixed broadband connections prices, the lack of digital skills of citizens and the lower integration of digital technologies to the enterprises (Bulgaria- DSM, [20.03.2019]).

4.1.2. ICT Access and Usage in the EU

The ICT usage and integration rates of countries are other important indicators for the digitalization of the countries. Access to the ICTs through internet is evaluated as a cornerstone of the digital economy. ICT access and usage is also one of the key determinants for the measurement of the DSM's success.

ICTs give limitless connecting capacity for enterprises and individuals across the world. In addition, this situation allows the flow of information electronically between different business functions within an enterprise and allows increased cooperation between suppliers and consumers. Moreover, the use of ICTs also creates a great opportunity to make crucial changes in the way in which enterprises do their businesses.

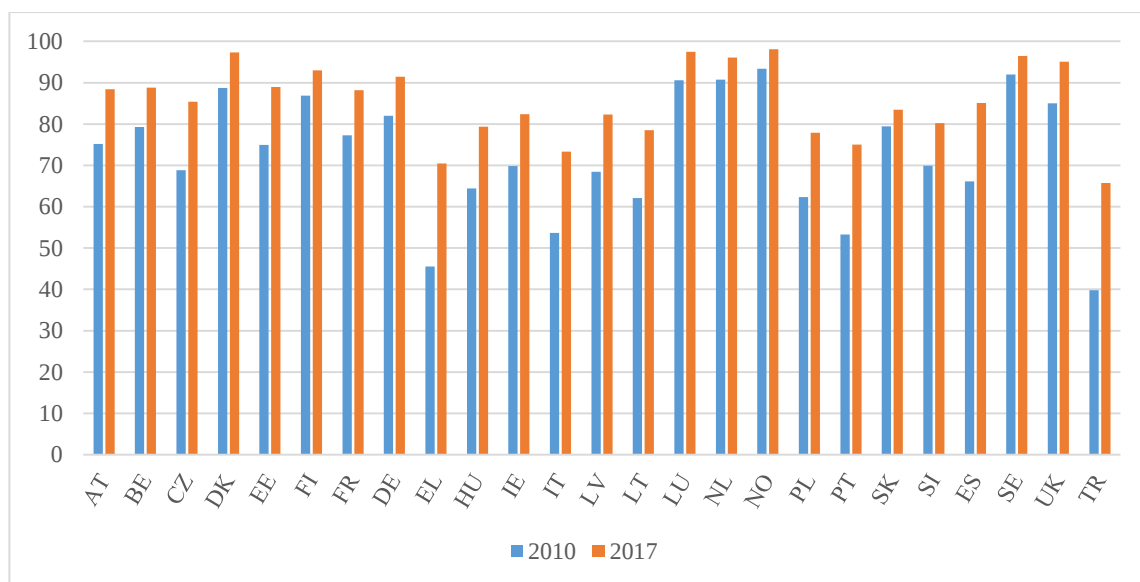


Figure 4.4: ICT Access and Usage by Individuals in the EU, 2010-2017, (%)

Source: OECD Stat. 2018a. **ICT Access and Usage by Households and Individuals: ICT Access and Usage by Individuals.**

Figure 4.4 shows the ICT access and usage rates by individuals in Europe between 2010 and 2017. As provided in Figure 4.4, ICT usage and access by households differ across the Member States. Denmark and Luxembourg (97%), Sweden and Netherlands (96%), Finland (93%), and Germany (91%) have the highest ICT access and usage rate. In Denmark and especially in Luxembourg, the ICT access by the individuals is the highest and as a result of the existence of digitally well-equipped individuals and intelligent capital. Furthermore, the government have many attempts, such as the Luxembourg

Cluster Initiative, Luxinnovation, for creating the digital ecosystem. These attempts foster the digital performance of Luxembourg across its global competitors.

Conversely, people in Hungary (79%), Lithuania (77%), Poland (77%), Portugal (74%), Italy (73%), and Greece (70%) have low ICT access. The main reason behind the low ICT access of these countries and especially Greece in the ICT usage by individuals is arising from the lack of good broadband penetration and low frequency of internet use. The low digital skills of Greek citizens to use electronic devices also create a challenge in ICT usage and access. Moreover, the existence of high levels of low educated, unemployed or inactive population in Greece compared to the other EU Member States are also among the reasons of its low digital performance (Tsakanikas and etc. 2014, 11). Additionally, in Turkey, ICT access and usage by individuals has significantly increased compared to 2010. However, only 65% of people has ICT access and usage in Turkey and its share is below the European average.

Figure 4.5 shows the ICT access and usage rate by enterprises in Europe in 2010 and 2017. According to the Figure 4.5, average EU-28 ICT access by enterprises increased from 66 % in 2010 to 76 % in 2017. More than 76% -is the EU's average- of enterprises have ICT access in Finland (96%), Denmark (95%), and Sweden (91%), while enterprises in Hungary (68%), Poland and France (66%), Portugal and Greece (64%), and Latvia (62%) have ICT access less than the EU-28 average.

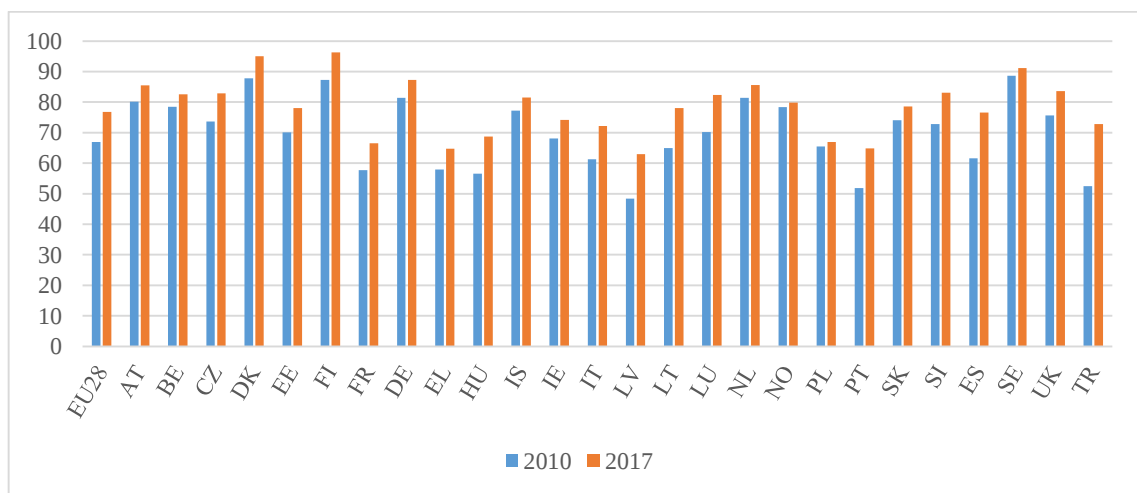


Figure 4.5: ICT Access and Usage by Enterprises in the EU, 2010-2017, (%)

Source: OECD Stat. 2018b. ICT Access and Usage by Businesses.

Almost all enterprises in the EU benefit from the ICTs. The growing importance of the ICTs reveals that they are key indicators for the performance of the enterprises. Increased use of digital technologies and integration of ICTs into the enterprises tend to vary across countries in the EU. For instance, ICTs play an important role in Finn enterprises, followed by Danish and Swiss enterprises. Surprisingly, the digital intensity of enterprises in France is lagging behind the EU's average. Despite the full access to the internet in French enterprises, ICT penetration is relatively low. The lack of public confidence in business technologies in France is the main reason behind the ICT performance of French enterprises. As regard to Figure 4.5, The main reason behind the gap between highly digitalized economies and others is the existence of expensive broadband systems (Macchi, Berthon, Robinson, 2015, 9).

Additionally, ICT employment in enterprises affects the productivity by increasing the efficiency of companies. ICT provides access to information and it is easily adapted to all production processes. Thus, ICT employment has a great importance in the digital economy. Figure 4.6 demonstrates the ICT employment of enterprises in European countries in 2011. As provided in the Figure, the average of EU-28 in ICT employment is 3.7 % in the corresponding year. Finland (6.4%) has the highest ICT employment rate among the EU countries, followed by Ireland (5.2%), Hungary (4.9%) while Portugal and Greece (1.8%) have the lowest ICT employment rates. Finland, one of the leading ICT countries in the world, has the highest ICT employment among the EU countries. Rapid improvements in ICTs and its feature of being a data center require higher ICT employment in Finland's digitalized economy, especially in the ICT sector.

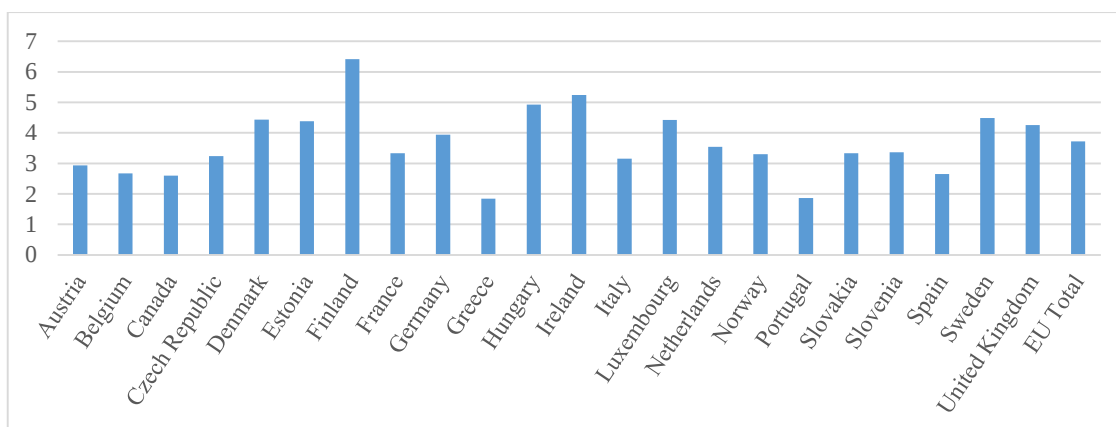


Figure 4.6: ICT Employment in the Digital Economy, 2011, (%)

Source: OECD Stat. 2018c. **ICT Employment.** (Data for Turkey is not available.)

Besides, ICT sector is a good enabler for the digital economy and it has a great impact on productivity by improving capital utilization, increasing the returns to human capital, connecting people to work and markets, and increasing consumer surplus (World Bank, 2016, 11-16). The EU's ICT sector value added amounted to 593 billion Euro in 2014. The value added of ICT services amounted to 541 billion Euro (91% of the total value-added), while value added of ICT manufacturing amounted to 52 billion Euro (9% of the total value-added) in 2014 (European Commission, 2017b, 83). However, in 2015, total value added of ICT sector in the EU amounted 570 billion Euro which approximately corresponds to 4% of the EU's GDP (ICT sector- Value Added, Employment and R&D, [23.01.2019]).

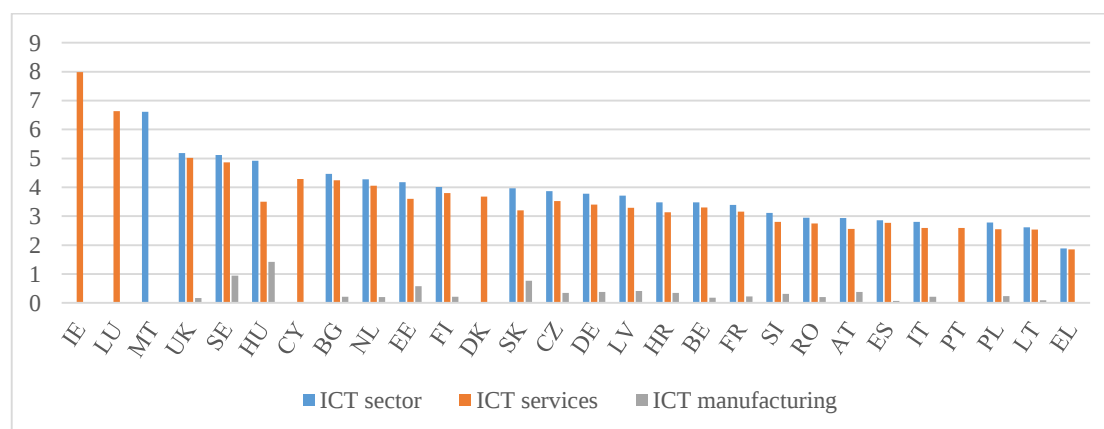


Figure 4.7: Value Added of the ICT Sector in the EU, 2015, (% relative to GDP)

Source: **ICT sector- Value Added, Employment and R&D.** [23.01.2019]. Eurostat. Data for ICT sector in Ireland, Luxembourg, Cyprus, Denmark, and Portugal is not available. Data for ICT services in Malta is not available.

Figure 4.7 shows the ICT sector value added relative to the EU GDP in 2015. Figure 4.7 also presents the share of ICT services and manufacturing sector, separately. ICT manufacturing sector includes manufacturing communication equipment, computers and peripheral equipment, and consumer electronics, etc., while ICT services sector includes computer programming, consultancy and related activities, telecommunications, software publishing, repair of computers and communication equipment. In 2015, the value added rate of ICT services in EU's GDP is the highest in Ireland (8%) followed by Luxembourg (6.6%). Furthermore, value added by Malta is also equivalent to 6.6 % of its GDP. The value added of ICT sector in GDP is the highest in Ireland as a result of large inflows of foreign direct investments (World Bank, 2016, 63). Another reason behind the high performance of Ireland in ICT services sector is that Ireland is the one of the biggest provider of IT services and computers both in the EU and the world. Moreover, the world's giant companies such as Apple, Microsoft, HP, IBM, Google, Amazon, Facebook, LinkedIn have an establishment in Ireland. (Start a Business in Ireland, [09.03.2019]). This situation indicates that the ICT services sector in Ireland is the main driver of the Ireland's digital economy.

In contrast, the lowest value added of the total ICT sector relative to GDP s in Greece (1.9%), Lithuania (2.6%), and Poland (2.8%). There are differences among the development of the ICT sectors in the EU Member States. Some of the EU countries have quickly adapted their existing sectors to the ICT sector, while relatively less digitalized EU countries such as Greece, Lithuania and Poland still sustain old sector structures. Thus, their value added of ICTs are less than the highly digitalized countries in the EU.

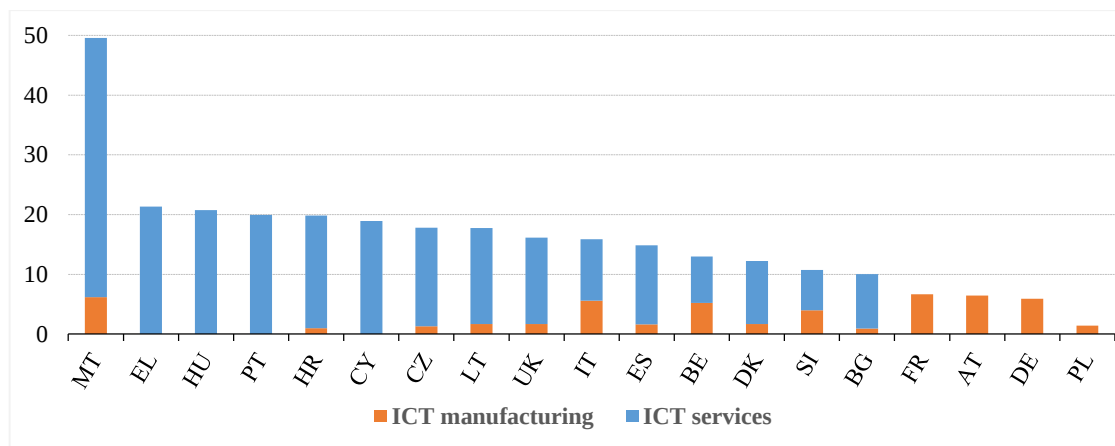


Figure 4.8: ICT and Business Enterprise R&D Expenditure in the EU, 2014, (%)

Source: **ICT sector- Value Added, Employment and R&D**. [23.01.2019]. Eurostat. ICT manufacturing data is not available for Greece, Hungary, and Portugal. ICT services data is not available for France, Austria, Germany and Poland.

Figure 4.8 provides the share of the ICT sector in business enterprise expenditure on R&D in 2014. Business enterprise R&D expenditure in the EU is accounted for 30 billion Euro and 18 billion Euro (62% of total) was spend for ICT services sector (European Commission, 2017b, 89). On the one hand, the R&D expenditure in ICT services sector is highest in Malta (43%) followed by Greece (21%), and Hungary (20%). Malta has the highest share of R&D expenditures on ICT services, as a result of the existence of the fastest broadband coverage and high quality in e-government services in comparison with the other EU Member States (Malta-DSM, [24.01.2019]). By contrast, the R&D expenditure in ICT services is the lowest in Slovenia (6%) and Belgium (7%). On the other hand, the R&D expenditures in ICT manufacturing sector is the highest in France, Austria and Malta with 6%, and Germany, Italy and Belgium with 5% in 2014. By contrast, Cyprus, Croatia, Bulgaria and the Czech Republic has the lowest R&D expenditures in ICT manufacturing as of 2014.

ICT export and import rates also have significant contributions on the digital economy. In this framework, countries have recognized the positive role of ICT on their economic growth and efficiency in the national and international level. While some of the countries produce ICT goods and services, others have to import them, to benefit from the all positive contributions of the ICT trade. This situation creates some economic implications on the competitiveness of countries and the prices of ICT goods and services.

Figure 4.9 and Figure 4.10 show the shares of ICT trade of the EU, OECD countries and Turkey in global trade between 2005 and 2016. ICT goods trade includes computers and related equipment, devices for communication, consumer electronic devices, and other ICT goods. According to the UNCTAD data, world ICT goods exports decreased from 13% in 2005 to 11% in 2016. In 2016, total ICT goods exports increased by 2%, in the world, 3% in the EU and 2% in OECD countries compared with the last year. This rate decreased by 8% in Turkey relative to the previous year. However, total ICT goods exports decreased by 15% in the world, 39% in the EU, 36% in OECD countries, and 69% in Turkey from 2005 to 2016. General trend of the ICT goods exports is decreasing. However, the results show that there is an upward trend among the EU and OECD countries, in comparison with Turkey.

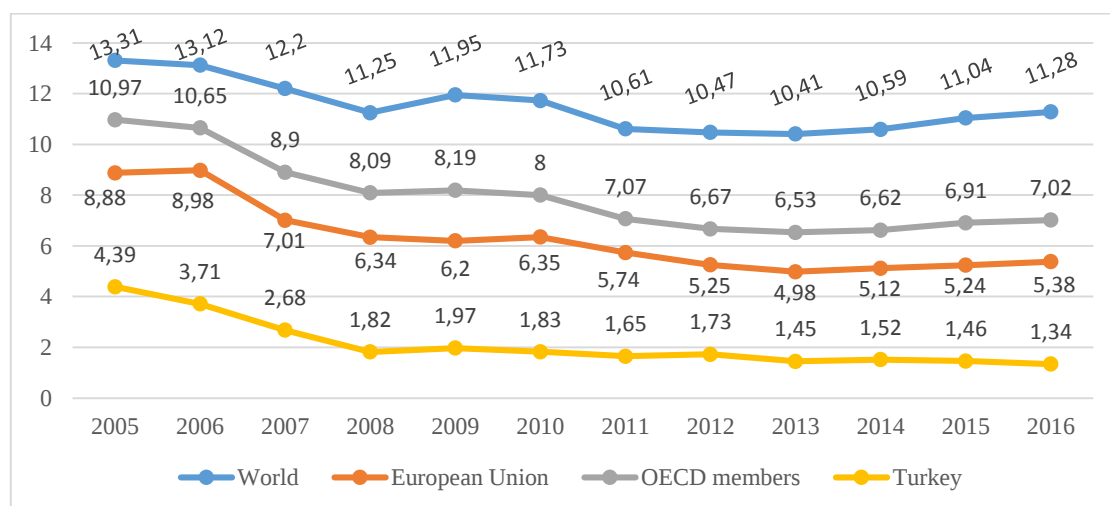


Figure 4.9: Total ICT Goods Exports in the Digital Economy, 2005 – 2016, (%)

Source: UNCTAD Stat. 2018. **Share of ICT Goods as Percentage of Total Trade, Annual, 2000-2016.**

As seen from Figure 4.10, ICT goods imports is reported at 12.99% in 2016 and 13.55% in 2005 in the world. The world ICT goods imports decreased by 4% from 2005 to 2016. ICT goods imports of the EU decreased by 26% during the same period. ICT goods imports of Turkey is well below the EU and OECD averages. Trend in the ICT goods imports of Turkey is surprisingly better than the world view. It has increased by 19% since 2015 and increased by 10% since 2005.

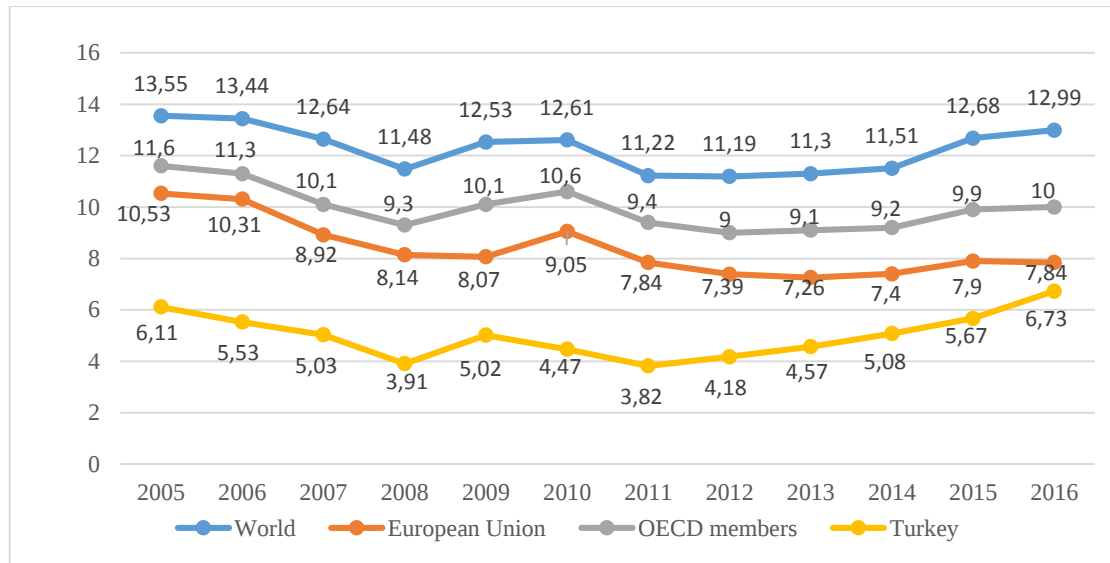


Figure 4.10: Total ICT Goods Imports in the Digital Economy, 2005 – 2016, (%)

Source: UNCTAD Stat. 2018. **Share of ICT Goods as Percentage of Total Trade, Annual, 2000-2016.**

It is possible to say that Turkey has a good position in the digital market. However, the low status of Turkey in internet use by individuals is a significant issue for the creation of good e-commerce environment. Thus, the obstacles which are against the improvements of digital market in Turkey should be identified and internet use by individuals should be promoted. Conversely, ICT investments and ICT usage rates in the EU countries are high and tend to increase. In addition to the ICT volumes, the examination of the e-commerce volumes is also necessary to measure the success of European DSM.

4.1.3. Human Capital and Digital Skills in the EU

Increased penetration of the ICTs to societies and economies inevitably require an increase in digital skills. Nowadays, the required digital skills to perform well are different from the requirements of the past.

The digital skills refer to a wide range of different abilities which are the “combination of behaviors, expertise, know-how, work habits, character traits, dispositions and critical understandings” (Broadband Commission, 2017, 4). According to ITU (2018) the digital skills are classified in three stages namely basic, intermediate and advanced skills. Basic skills consist of the ability to operate hardware (e.g. using digital devices such as keyboard or touch-screen technology), software (e.g. managing the settings or files in computer),

and online platforms (e.g. managing e-mail, searching data on internet). Intermediate skills consist of the ability to use of digital technologies for work-related purposes (e.g. digital graphic design or digital marketing). Next, advanced skills -ICT specialist skills- cover artificial intelligence, big data, cyber-security, coding, mobile app development (ITU, 2018, 6).

Besides, having a digitally skilled population and labor is a key driver for the digital transformation of countries. Thus, countries are increasingly creating roadmaps to accelerate the development of the digital economy and society and defining digital skills and competencies which change frequently as a result of technological advancements.

The development of digital skills in the European digital economy and society also plays an important role in the EU's DSM. Thus, European Commission launched the New Skills Agenda for Europe on 10 June 2016. This agenda promotes each EU Member State to develop its own national digital skills strategy in order to strengthen human capital, employability and competitiveness. Furthermore, it also concerns the elimination of challenges against digital society and the promotion of education systems and training programs and new skills.

Figure 4.11 presents the digital skills of the EU population in four different levels such as no skills, low, basic and above basic skills for the year 2017. Considering the European digital skills levels, 31% of the EU-28 population has advanced digital skills, while 26% of the population has low digital skills. Moreover, the population which has no digital skills in the EU is only 17%. 55% of the Luxembourgian population has advanced digital skill levels and is on the top among the other EU Member States. However, 35% of the Romanian population have an insufficient digital skills needed to perform effectively in the digital society. This scarcity in the digital skills of the population generally results from the citizen profiles of Romanians who have the lowest internet usage (64%) among the other EU Member States.

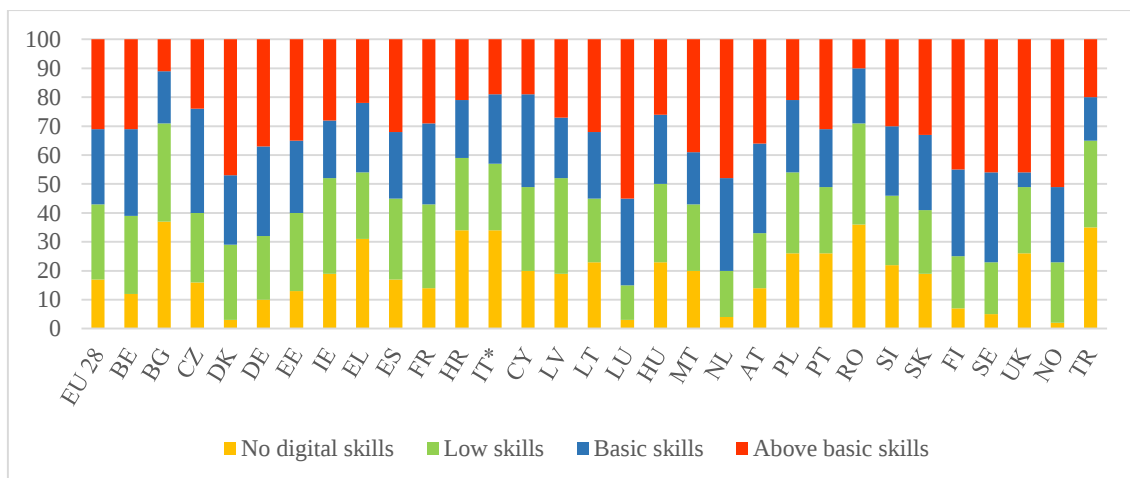


Figure 4.11: Digital Skills of the EU Population in the EU-28, 2017, (%)**

Source: Eurostat. 2018j. **Individuals' Level of Digital Skills.** [isoc_sk_dskl_i] * Data for 2016, ** The population of individuals aged between 16-74 which represent the %75 of the total population.

There are major disparities which cause the existence of the population with low or no digital skills among the Member States. These disparities which cause a population with the low or no digital skills result from the low education levels, low-income levels or low internet usage. Countries such as Romania and Bulgaria suffer from low or no digitally skilled population and this situation creates a decreasing trend in their digital transformation performance and causes to lag them behind the other EU Member States.

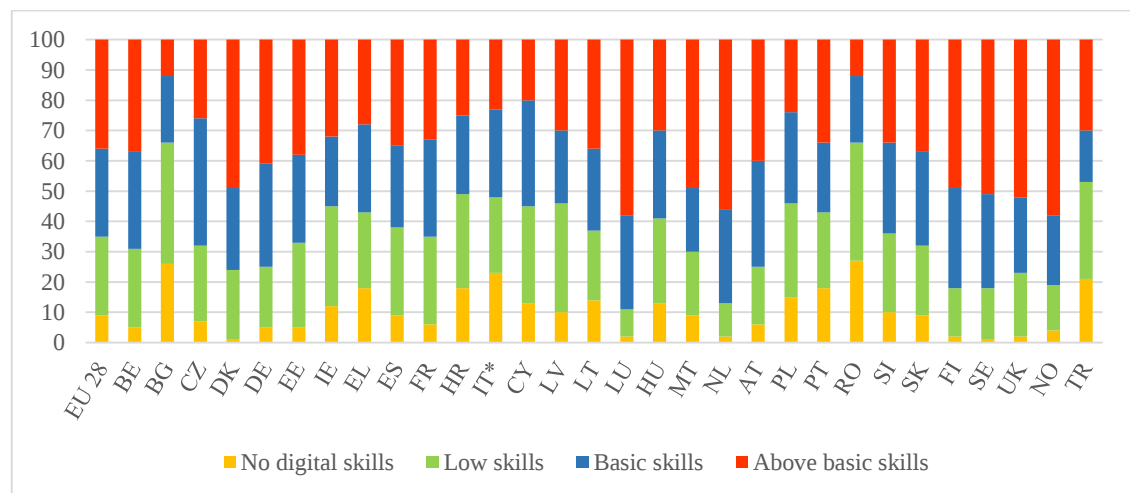


Figure 4.12: Digital Skills of the EU Labor Force in the EU-28, 2017, (%)

Source: Eurostat. 2018j. **Individuals' Level of Digital Skills.** [isoc_sk_dskl_i] *Data for 2016.

In addition to the digital skills of the EU population, Figure 4.12 shows the digital skills of the individuals who employed in the EU labor market. In 2017, while 35% of the EU's

labor force has an insufficient digital skills level, more than half of the EU labor force is digitally skilled.

The share of the EU's active labor force with above basic digital skills is high in Luxembourg (58%), Sweden (51%), Denmark and Finland (49%). Digitization performance of these countries are also relatively higher in internet usage by households and enterprises. Similarly, ICT penetration of the enterprises in these countries is higher than the other EU Member States. Conversely, the share of the EU's active labor force which has low or no digital skills is highest in Romania and Bulgaria (66%). This situation results from the same reasons which also affect the digital skills of the populations.

There are still large digital skills gaps between the labor markets of the EU Member States. Nevertheless, the current state of the EU's labor market in this respect is constantly developing. This development requires the employment of labor with advanced digital skills or ICT specialists.

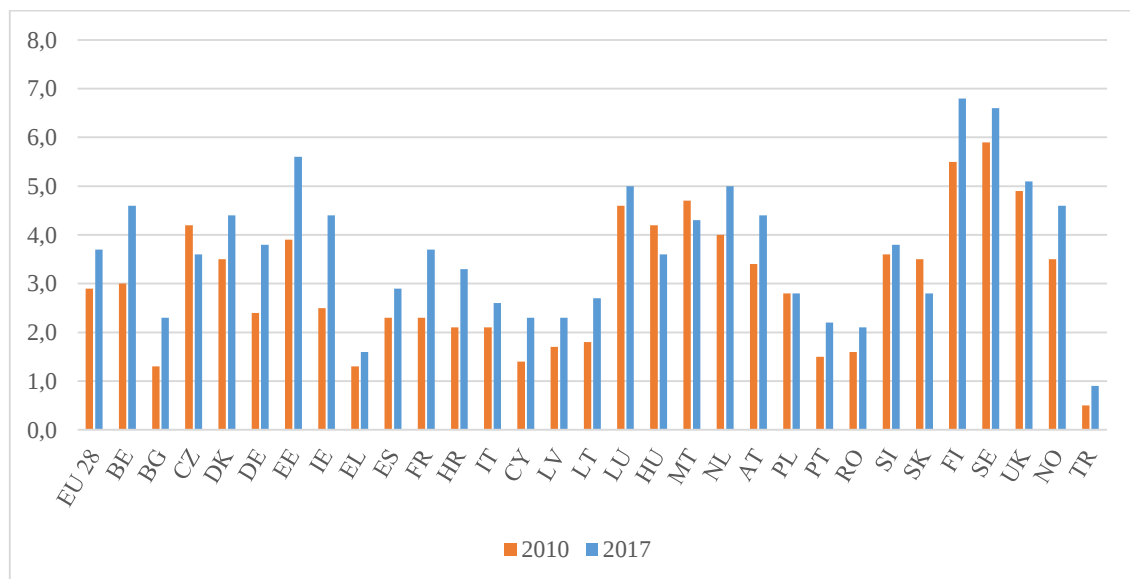


Figure 4.13: ICT Specialists Employed in the EU-28, 2010-2017, (%)

Source: Eurostat. 2018k. **Employed ICT Specialists.** [isoc_sks_itspt]

Figure 4.13 presents the trend in the share of ICT specialists employed in the EU-28 between 2010 and 2017. According to the definition of the OECD (2012b, 14), “ICT specialists have the ability to develop, operate and maintain ICT systems and thus ICTs constitute the main part of their jobs.” In recent years, the share of the ICT specialists in

the EU's total employment has constantly increased. The employment rate of ICT specialists in the EU-28 had risen by 0,8% between 2010 and 2017 and reached 3,7%. Among the EU Member States, Finland (6,8%) has the highest share of ICT specialists in the total employment, and followed by Sweden (6,6%) and Estonia (5,6%). However, Greece (1,6%), Romania (2,1%) and Portugal (2,2%) have the lowest share of ICT specialists who are employed in their enterprises.

There are major gaps in the share of the employed ICT specialists in the total employment between the EU Member States. Member States which have a relatively higher number of ICT specialists invest heavily in technology and develop their education systems to increase the number of STEM (Science, Technology, Engineering and Mathematics) graduates. Thus, the increasing quality of the ICT labor force positively affects the countries labor market by taking advantage of huge technological benefits. Bridging this gap is an essential priority of the EU to bring about an inclusive digital economy and society.

4.1.4 The Digital Performance Index: DESI and I-DESI

Assessment of success and performance of digital performance has critical importance in understanding sustainability and planning future attempts in this field. Thus, indexes are among the key tools used for measuring success and performance of individual countries. There are two indexes for measuring the performance of European digital economy. The DESI, launched by the European Commission in 2014, measure the digital performance of the EU's Member States. I-DESI measures EU's digital performance in comparison to the seventeen non-EU countries namely Australia, Brazil, Canada, Chile, China, Iceland, Israel, Japan, Mexico, Norway, New Zealand, Russia, Serbia, South Korea, Switzerland, Turkey, and the USA (European Commission, 2018d).

The DESI and I-DESI consist of five dimensions which are digital connectivity, (fixed, mobile, fast and ultrafast broadband and broadband prices), human capital (basic skills and use of internet, advanced skills and development), use of internet services (use of content by citizens, communication and online transactions), integration of digital technology (digitization of businesses and e-commerce), and digital public services (e-government and e-health) (European Commission, 2018e, 1). Every indicator is weighted

by the specific parameters. The digital connectivity and human capital contribute 25%, the use of internet services and digital public services contribute by 15%, and finally, the integration of the digital technology contributes 20% to the total DESI (European Commission, 2018e).

$$\text{DESI} = 0.25 * \text{Digital Connectivity} + 0.25 * \text{Human Capital} + 0.15 * \text{Use of Internet Services} + 0.20 \text{ Integration of the Digital Technology} + 0.15 * \text{Digital Public Services}$$

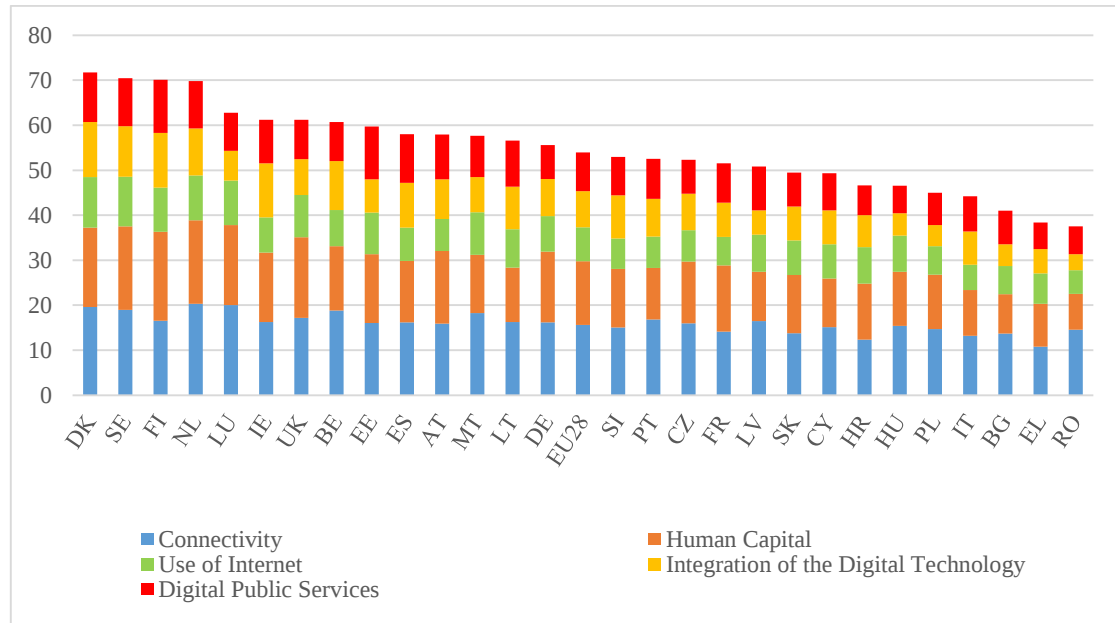


Figure 4.14: Digital Economy and Society Index (DESI), 2018, (%)

Source: European Commission. 2018f. **Digital Scoreboard.**

Figure 4.14 shows the performance of the EU states based on five dimensions. According to the DESI 2018, Denmark, Sweden, Finland and the Netherlands have over-performed in 2017. Denmark stands the first position among the EU countries. Especially, it made great progress in the use of digital technologies (Denmark- DSM, [31.01.2019]). Sweden keeps its second position by advancing its already high digitization in 2017 and it has a higher share of the internet usage because its citizens are active users of the internet. Finland ranks third in DESI 2018 which is one of the most digitalized countries overall the world. Additionally, Finland invests heavily in digital skills of its citizens, and R&D processes, especially on digital public services. Finally, the Netherlands has the fourth position in DESI 2018. Similar to Sweden, its best contribution to the digitization results from the high internet usage rate. In contrast to the highly digitized countries of the EU,

Italy, Bulgaria, Greece and Romania have the lowest rates in the DESI 2018. For instance, integration of the digital services and digital public services are key drivers in Italy, but its main challenge results from the low level of the digital skills of its citizens. The worst scenario is in Greece because of the lack of incentives in advancing its digitalization progress in 2017.

Table 4.1: DESI Classification of the EU-28, 2018

High Performing Countries		Medium Performing Countries		Low Performing Countries	
Denmark	Ireland	Spain	Germany	Slovakia	Italy
Sweden	the UK	Austria	Slovenia	Cyprus	Poland
Finland	Belgium	Malta	Portugal	Croatia	Greece
Netherlands	Estonia	Lithuania	France	Hungary	Romania
Luxembourg		Czech R.	Latvia	Bulgaria	

Source: European Commission, 2018e. **Digital Economy and Society Index 2018**. May 18, 2018. Brussels. p.4.

In order to measure the DESI, the EU countries are classified as high, medium and low performing countries. Table 4.1 demonstrates the classification of the EU countries according to their digital performance.

I-DESI, similar to the DESI, has three key objectives. The first objective is the “general performance assessment” which aims to characterize the performance of 17 non-EU countries by taking into account their overall index scores and the scores of the main index dimensions. The second objective is “comparative analysis” which deals with the clustering of 28 EU countries based on their index scores and comparing countries in similar stages of digital development to reveal the requirements for improvement in relevant policy areas. The last objective “zooming in” focuses on identifying specific areas where the performance of EU-28 countries is competitive in comparison with the 17 non-EU countries and revealing areas where performance of countries need improvements.

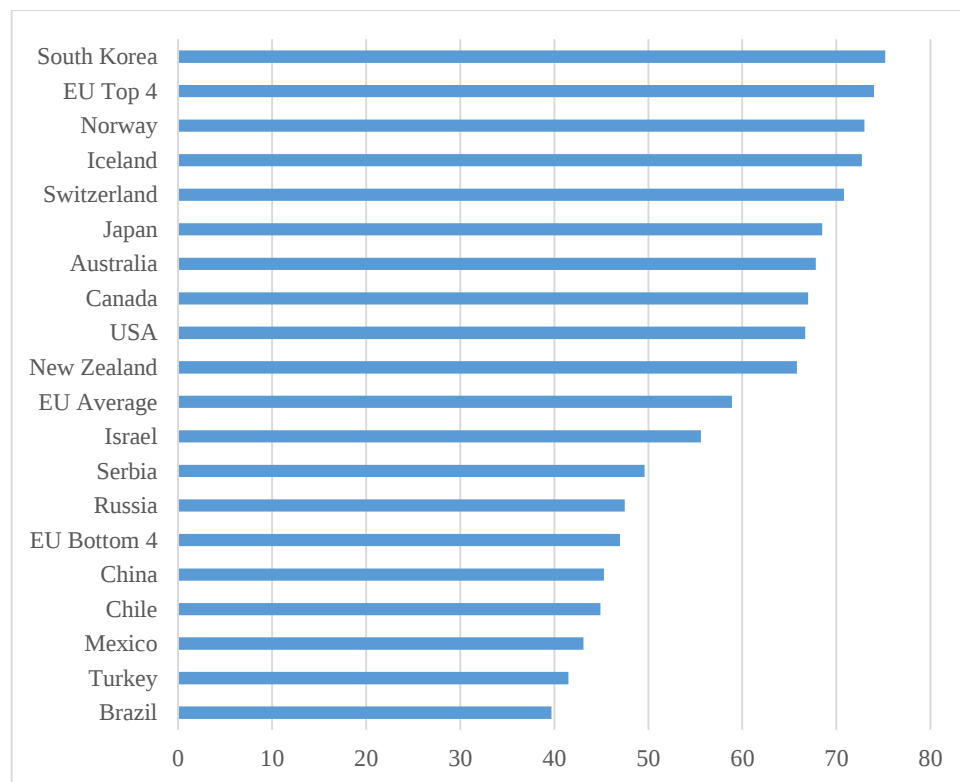


Figure 4.15: Average Scores for I-DESI in 2016, (%)

Source: European Commission. 2018d. International Digital Economy and Society Index 2018. Luxembourg: Publications Office of the European Union. p. 14.

Figure 4.15 presents the digital performances of the EU Member States and non-EU countries in respect to the all dimensions of the DESI. As shown in the Figure, there are two classifications of the EU countries such as the EU top 4 and EU bottom 4 on average. These four countries are not necessarily the same in each category dimension. According to the I-DESI, EU countries performed well and EU top 4 countries kept their global leading position by going ahead of Japan, and the US, except from South Korea. However, there is a huge gap between the EU top 4 countries and bottom 4 countries. Especially, the EU countries are well performing in the categories of connectivity, digital skills and use of the internet relative to the 17 non-EU countries. But, performance of the EU Member States in the category of the digital public services is continuously low relative to the performance of the 17 non-EU countries (European Commission, 2018h).

According to the DESI, the EU market is transforming to digital but progress is still insufficient due to several reasons. One of these reasons is that the EU's digital performance lags behind its global competitors such as the US and China. In another

words, the EU market is less developed in some critical sectors which are the key sectors for digital transformation such as robotics, automation, industry 4.0, in comparison with its competitors. According to Heyman and Körner (2018), the EU's attempts for DSM mostly focus on the improvement of digital infrastructure (e.g. fixed and wireless networks, data centers and etc.) and on the regulatory framework. Nevertheless, the development of the digital infrastructure has critical importance for the DSM but it is not enough to catch up the all competitive advantages of the global digital market.

4.2 E-commerce and Taxation in the European Digital Single Market

The EU took first steps towards the implementation of e-commerce through its DSM strategy which aims building required digital infrastructure and regulatory frameworks for e-commerce. Correspondingly, the EU has taken VAT regulations subject to cross-border e-commerce more seriously since e-commerce has been taking an increased share of its total imports and exports. Furthermore, the EU has published legal provisions which have a major impact on e-commerce companies to allow them benefit from fairer rules and lower compliance costs.

4.2.1 Trends and Drivers of E-commerce in the EU

4.2.1.1 Trends in E-commerce Transactions in the World

E-commerce is one of the most popular online activities around the world and is expected to bring revenue of 2.8 trillion US Dollar in the world and 602 billion Euro in the EU in 2018. Figure 4.16 presents that the value of e-commerce in GDP and thus the E-GDP has an increasing trend in the world and the EU as a result of the increase in e-commerce activities. Furthermore, continual developments in the digital transformation in the world have been accelerating the increase in this trend and expanding the e-commerce market. In the last four years, the EU's e-commerce market grew by 47% to 534 billion Euro in 2017 while the global e-commerce market grew by 72% to 2.3 trillion US Dollar during the period considered.

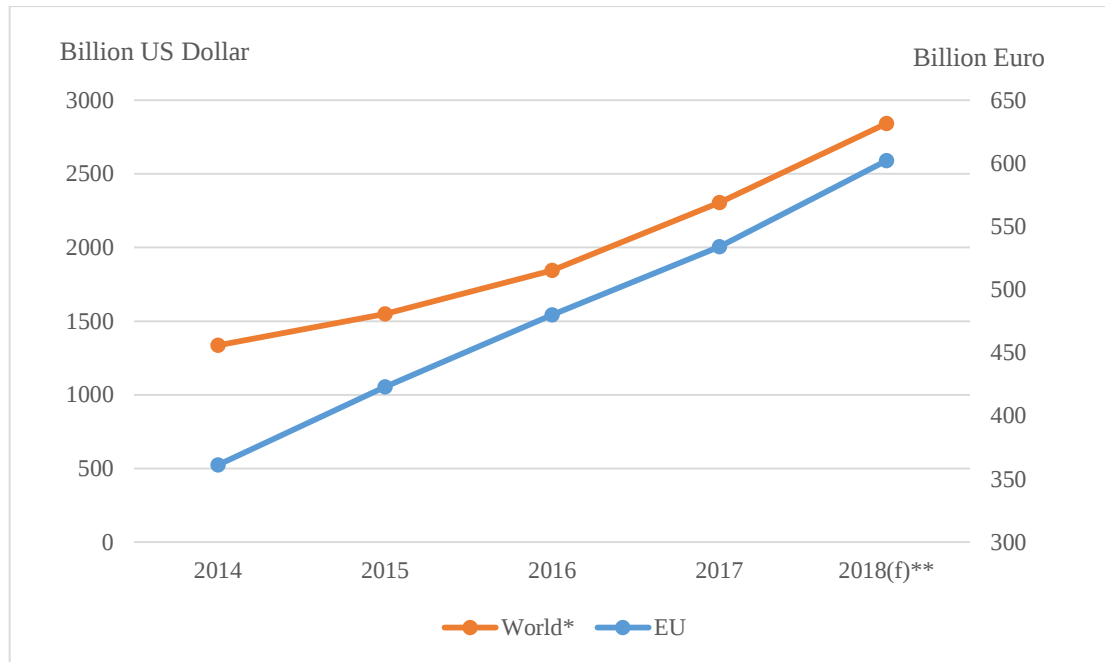


Figure 4.16: Value of E-commerce Transactions in the EU and the World, 2014-2018

Source: Ecommerce Europe. 2018. **The European Ecommerce Report 2018: Relevant Findings Outlined**. Brussels. *Statista. 2019. Retail E-commerce Sales Worldwide from 2014 to 2021 (in billion US dollar). <https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/>. Accessed: [12.04.2019]. ** Data for 2018 in the EU and world is forecasted.

Global e-commerce sales has been growing rapidly, however, the growth in the European e-commerce sales is the slowest among the other world competitors such as Asia-Pacific, North America. Figure 4.17 illustrates the global e-commerce sales at the regional level. According to the International Post Corporation, Asia-Pacific is the leading region in the world, followed by North America and Western Europe. Moreover, e-commerce share of Asia-Pacific region is expected to rise to 67% in 2021 (up from 32% in 2010) in contrast to the trend of e-commerce transactions of North America and Western Europe. In 2017, Asia-Pacific region has more than a half of the global total e-commerce sales, furthermore, online retail market share is already above the combined shares of North America and Western Europe.

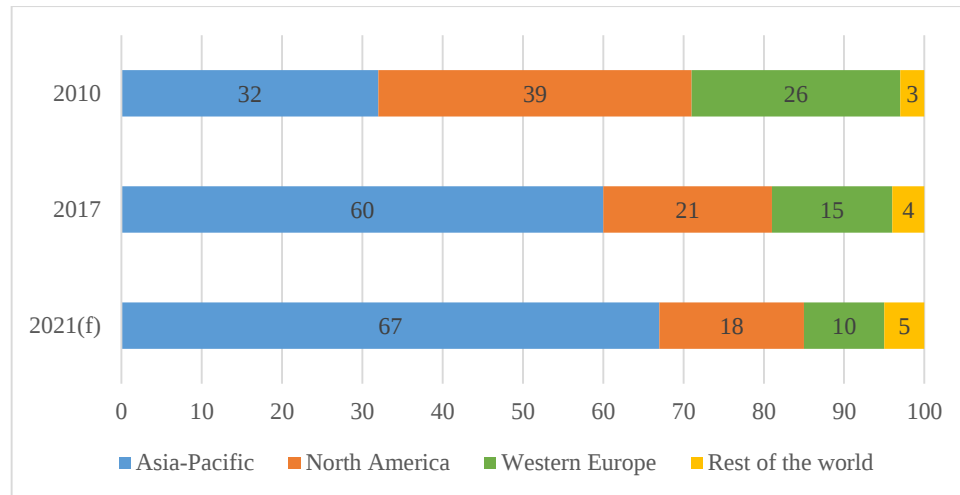


Figure 4.17: Size of E-commerce by Regions, 2010-2021, (% of GDP)

Source: International Post Corporation. 2017. State of E-commerce: Global Outlook 2016-21. <https://www.ipc.be/sector-data/e-commerce/articles/global-e-commerce-figures-2017>. Accessed: [11.04.2019].

The main reason behind the highest e-commerce growth in Asia-Pacific compared to North America and Europe is that its economy is highly penetrated to the productive digital technologies such as Artificial Intelligence, IoT, 5G wireless systems, machine learning and block-chain technologies. Especially, South Korea, China, and Japan are the top three economies in which these technologies mostly spread to e-commerce activities. (ADB, UNESCAP, 2018, 6). Additionally, increase in the usage of mobile devices by consumers and the development of the new digital payment channels (e.g. digital wallets) through digitalization in Asia Pacific are other among the crucial reasons.

4.2.1.2 Trends in E-commerce Transactions in the EU

A crucial indicator of the digital economy that measures the success of the DSM is the e-commerce. Over the last years, the European Commission has been focusing to identify the potentials affecting the EU's e-commerce markets as part of the EU's DSM initiative. Following figures show the e-commerce volumes of countries presented at individual and enterprise level and identifying their effects to the e-commerce market of the EU. Table 4.2 shows the share of individuals who used internet and purchased goods and services online in 2017. According to the Table, Denmark, Luxemburg, and Sweden have the highest internet use with a share of 97%, while the UK has the highest rate of individuals who purchased goods and services online (82%). The UK –as the leading country- is

extending its e-commerce market rapidly. In addition, online shopping activities of the UK consumers are continuously increasing. In the UK, main drivers behind the high level of online shopping are improved confidence and convenience in online transactions and guaranteed delivery systems. Moreover, the existence of leading e-commerce companies such as Amazon and eBay plays an important role for the UK's e-commerce market (E-commerce in the United Kingdom. [06.03.2019]).

Table 4.2: Individuals Who Used Internet and Purchased Online in the EU, 2017, (%)

Share of individuals who:		
	used internet within the last 12 months	purchased online within the last 12 months
EU-28	85	57
Belgium	89	60
Bulgaria	66	18
Czech Republic	85	56
Denmark	97	80
Germany	91	75
Estonia	89	58
Ireland	82	53
Greece	70	32
Spain	85	50
France	88	67
Croatia	69	29
Italy	73	32
Cyprus	81	32
Latvia	82	46
Lithuania	79	38
Luxembourg	97	80
Hungary	79	39
Malta	81	52
Netherlands	96	79
Austria	88	62
Poland	78	45
Portugal	75	34
Romania	70	16
Slovenia	80	46
Slovakia	83	59
Finland	94	71
Sweden	97	81
United Kingdom	95	82
Iceland	98	76
Norway	98	77
Switzerland	95	77
Turkey	66	21

Source: Eurostat. 2018e. **Internet Purchases by Individuals.** [isoc_ec_ibuy]

On the contrary, the lowest proportion of individuals who purchased online is in Romania (16%) and Bulgaria (18%). Also, the lowest rate of internet use is in Bulgaria (66%) and it is well below the EU average. Considering the e-commerce potential of Eastern European countries, Romania lags behind the average of the EU-28. The main reasons which discourage Romanian consumers buying online are the lack of trust in e-commerce and payment transactions. Moreover, most of the Romanian consumers prefer the cash on delivery option in their e-commerce experience (E-commerce in Romania. [06.03.2019]). Another important reason arises from the existing delivery challenges such as long delivery times or wrong product delivery (Angelovska, Nina. [06.03.2019]). Among the non-EU states, Norway and Iceland has the highest level of internet use (98%), well above the EU average. However, their participation to e-commerce is lower than the leader EU countries. In addition, Turkey has a low participation rate to e-commerce. Either internet use or proportion of individuals who purchased goods and services online in Turkey is lower than the EU-28 average. The rate of internet use in Turkey is 66% and this rate is 19% lower than EU-28 average while the share of individuals purchasing online is 36% below the EU-28 average.

According to the OECD data, Figure 4.18 shows the share of individuals who sell online in Europe between 2010 and 2017. Netherlands (up from 24% in 2010) and Denmark (up from 28% in 2010) have the highest rates of selling online among the other EU countries in 2017. Norway maintains its leader position in online sales by individuals compared with the EU countries. Individuals in Netherlands (37%), Denmark (29%), France (25%), Finland (24%), Sweden (22%), Slovakia (21%), and Belgium (20%) are more interested in the selling goods and services online among the other EU countries in 2017. In contrast, individuals who sell goods and services online in Italy, Portugal, and Latvia (8%), Lithuania (7%), and Greece (2%) are low in 2017. Furthermore, Greece has the lowest share among EU countries in the same year.

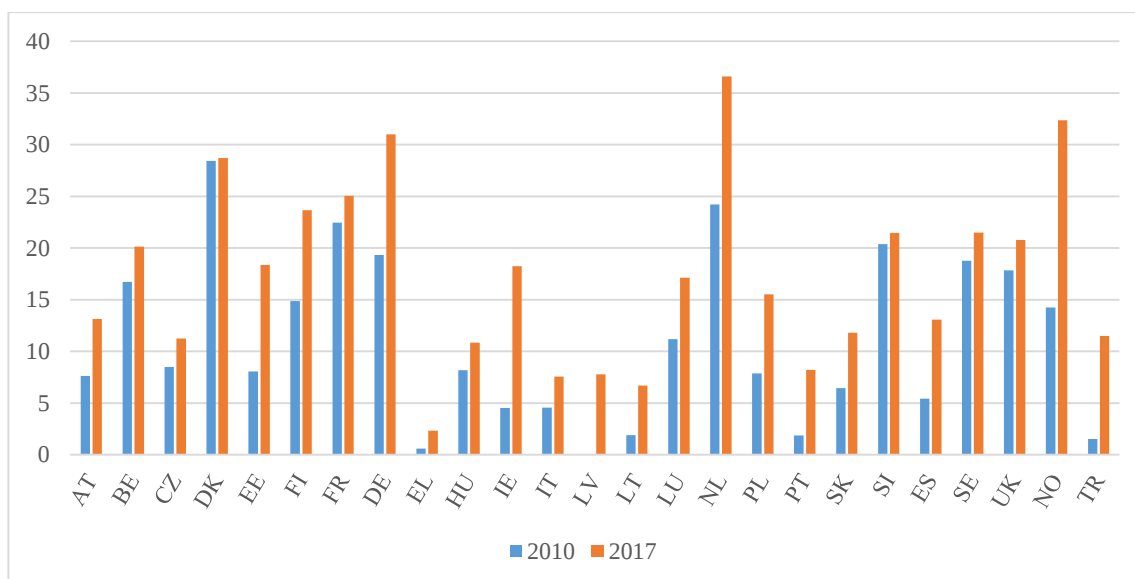


Figure 4.18: Individuals who Sell Online in the EU, 2010-2017, (% of individuals)

Source: OECD Stat. 2018a. **ICT Access and Usage by Households and Individuals: ICT Access and Usage by Individuals.**

In 2017, the number of individuals who sell online had increased eight and seven times, respectively in Latvia and Lithuania, while individuals in these countries almost did not interested in e-commerce sales in 2010. Similarly, the number of individuals who sell online has increased four times since 2010.

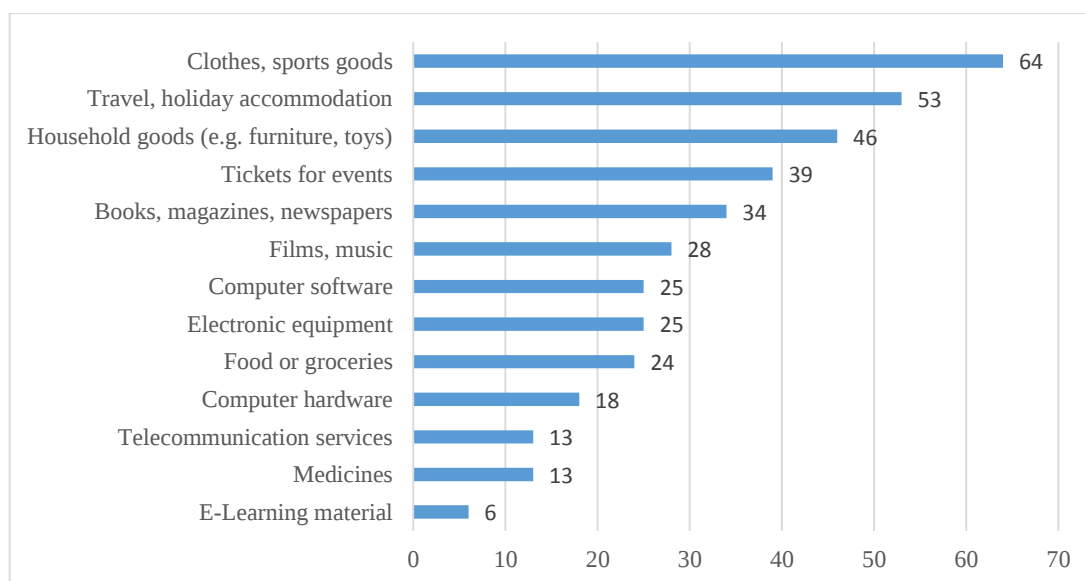


Figure 4.19: Purchased Goods and Services Online by European Consumers, EU-28, 2017, (% of population)

Source: Eurostat. 2018e. **Internet Purchases by Individuals.** [isoc_ec_ibuy].

Figure 4.19 presents the most popular goods and services purchased online by the European consumers aged between 16 and 74. The most preferred goods and services among the European consumers in the e-commerce market is the clothes and sports goods, followed by travel, holiday accommodation and household goods such as furniture and toys. Nearly, two thirds of the EU-28 population purchased clothes and sport goods online in 2017. Conversely, the share of consumers who purchased online for e-learning materials (e.g. e-books, e-newspapers and e-magazines) has the lowest share. In addition, European consumers most commonly prefer to purchase medicines, telecommunication services and computer hardware systems from a physical store rather than online.

Besides the individual aspect of the e-commerce, there are several objectives to create better market conditions for enterprises in their e-commerce transactions in line with the EU's DSM strategy. These objectives are related to the abolishing the barriers of 28 fragmented markets and their legal and regulatory institutions, and etc. The following figures examine the effects of these objectives on the e-commerce performance of enterprises in accordance with the relevant data. Figure 4.20 presents the shares of all enterprises engage in e-commerce sales in the EU in 2010 and 2017. The average rate of the EU-28 for the e-commerce sales by enterprises is 18% in 2017 and it is increased from 13% in 2010. Additionally, as of 2017, 30% of all enterprises in Ireland made e-commerce sales at the highest share among the EU countries, followed by Sweden and Denmark (29%). As the biggest ICT services supplier in the world, Ireland has the leader position in e-commerce. This situation not only makes Ireland a leading country in the digital economy but also increases Ireland's e-commerce potential positively. Similarly, the e-commerce sales by enterprises is 29% in Norway. The shares of these countries is well above the average of the EU-28. In contrast, only 7% of all enterprises in Bulgaria made e-commerce sales, followed by Italy, Luxemburg, and Romania at 8%. Especially, in the Eastern European countries, this situation results from the consumer's behaviors and negative attitudes against e-commerce transaction (E-commerce in Western and Eastern Europe. [06.03.2019]). During the same year, only 11% of all enterprises made e-commerce sales in Turkey. The share of all enterprises in e-commerce in Turkey had increased only by 3% compared with the 2010. Moreover, as shown in the Figure, there is a decreasing trend in Luxembourg and Netherlands by 6%, in Croatia by 4%, in Belgium

by 2% and Portugal by 1% in the e-commerce sales of the enterprises between 2010 and 2017. Surprisingly in Norway, a decreasing trend is recorded by 5% between the selected years (down from 34% in 2010).

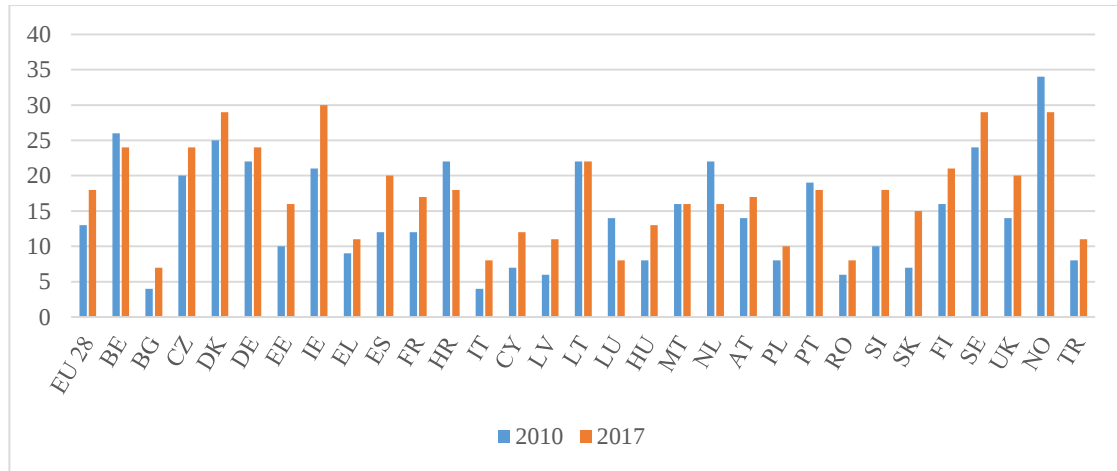


Figure 4.20: E-commerce Sales of All Enterprises, 2010-2017, (% of enterprises)

Source: Eurostat. 2018f. **E-commerce Sales**. [isoc_ec_eseln2]

Another important determinant for measuring the volume of e-commerce made by enterprises is the share of enterprises which make e-commerce in domestic and foreign markets. Thus, market is divided into three categories. First group consist of the EU enterprises sell online to domestic consumers in their own country. The second group covers the EU market in which e-commerce transactions takes place between enterprises in a member country and the consumers in another member country of the EU. Finally, the last group refers to the non-European market and it includes the e-commerce sales from enterprises in a member country to the consumers in non-EU countries. In this framework, Figure 4.21 shows the share of enterprises engage in e-commerce sales to own country, other EU countries and non-EU countries. The level of e-commerce transactions differ greatly across the regions. The share of e-commerce sales in own country is relatively higher than the share of e-commerce sales to the other Member States and non-EU market. Thus, the consumers are more likely to purchase from online retailers based in their own country. According to the Figure, 20 % of EU enterprises sell online to consumers in their own country, only 9 % sell to consumers in other EU countries. E-commerce sales to consumers located in the non-EU market have been quite low (5 %).

There is an upward trend in the share of enterprises in intra and extra EU trade since 2011. For all time periods, the share of enterprises which make e-sales to domestic market is higher than the sales to the EU and the non-EU markets. Because, enterprises do not meet the challenges for selling of goods and services online in their own country market compared to the international market.

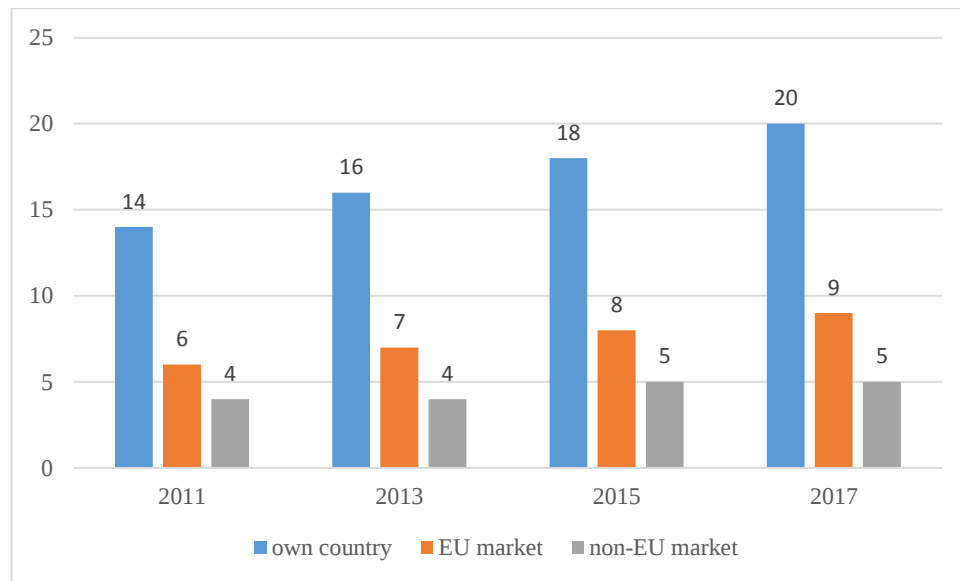


Figure 4.21: E-commerce Sales of All Enterprises in the EU-28, 2011-2017, (%)

Source: Eurostat. 2018f. **E-commerce Sales**. [isoc_ec_eseln2]

Table 4.3 shows the share of all enterprises which make e-commerce in three different market categories in 2017. On the one hand, the largest share of enterprises which make e-sales to the consumers in their own country recorded in Ireland at 31%, and followed by Sweden at 29% and in Denmark at 28%. Ireland, Denmark and Sweden perform well in their digital transformation process. Their digitalization successes create competitive advantage which directly affects their e-commerce market volumes. The share of enterprises in Ireland were 11% higher than the EU-28 average. In contrast, the lowest share of enterprises which make e-sales to consumers in their own country was represented by Romania (6%), followed by Bulgaria (10 %), Luxemburg and Poland (11%). The reasons behind the low e-commerce volume of these countries vary due to low digital skills of their population, preferences to shop and trust in cash payments (Angelovska, Nina. [06.03.2019]).

Table 4.3: All Enterprises Made E-commerce Sales in the EU-28, 2017 (%)

	to own country	to the EU	to the non-EU
EU-28	20	9	5
Belgium	23	13	4
Bulgaria	10	3	2
Czech Republic	23	13	4
Denmark	28	10	6
Germany	24	12	7
Estonia	18	9	4
Ireland	31	17	13
Greece	12	7	5
Spain	21	7	4
France	21	8	5
Croatia	17	9	6
Italy	12	6	4
Cyprus	12	9	8
Latvia	12	5	3
Lithuania	22	13	7
Luxembourg	11	8	3
Hungary	15	6	3
Malta	17	11	8
Netherlands	25	12	5
Austria	21	14	8
Poland	11	4	2
Portugal	17	8	6
Romania	6	2	1
Slovenia	20	12	4
Slovakia	17	8	3
Finland	24	6	4
Sweden	29	10	6
United Kingdom	22	9	7
Norway	28	6	4

Source: Eurostat. 2018f. **E-commerce Sales**. [isoc_ec_eseln2]

On the other hand, the highest share of enterprises which make e-sales to consumers in the other EU countries is recorded in Ireland (17%), followed by Austria (14%), and the Czech Republic (13%) in 2017. In contrast, the lowest shares of enterprises which make e-sales to consumers in the other EU countries were in Romania (2%), Bulgaria (3%) and Poland (4%). Finally e-commerce sales to the non-EU countries were the highest in Ireland (13%), followed by Cyprus, Malta and Austria (8%), while e-commerce sales to the non-EU countries were the lowest in Romania (1%), followed by Poland and Bulgaria (2%) in 2017.

The European Commission set objectives also for the SMEs, especially for new start-ups. Furthermore, it also determined difficulties about the establishment of an e-commerce

company and initiated new facilities for new start-ups and SMEs. The figures below demonstrate the success of SMEs in e-commerce transactions within the DSM.

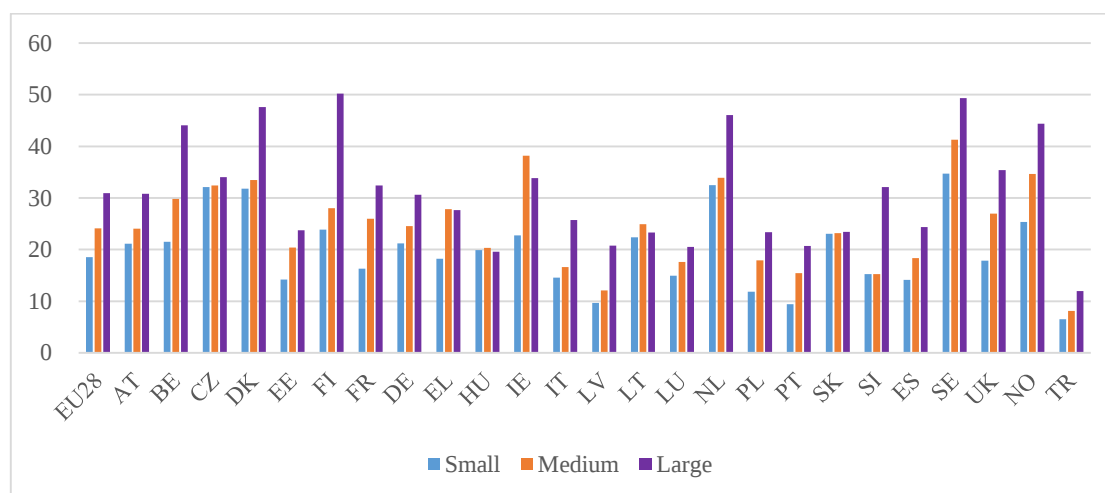


Figure 4.22: SMEs and Large Size Enterprises' E-sales in Europe, 2017, (%)

Source: OECD Stat. 2018b. **ICT Access and Usage by Businesses.**

Figure 4.22 shows the e-sales of SMEs and large size enterprises in the EU countries in 2017. Finland and Sweden, have the highest share in terms of large size enterprises which make e-sales in 2017, 50% and 49%, respectively. Average of the EU-28 countries for the large size enterprises is 31% in 2017. The large size enterprises which make e-sales in Latvia, Luxembourg, and Portugal are 10% below the EU-28 average. More than 24% of medium size enterprises make e-sales in Belgium (30%), the Czech Republic (32%), Denmark (33%), Netherlands (38%), and Ireland (34%). Similarly, the level of the medium size enterprises which make e-sales in Norway as a non-EU country is at 35%. The average level of the EU-28 is at 24% in terms of the medium size enterprises which make e-sales.

The average level of the EU-28 is at 19% in terms of the small size enterprises. Moreover, the highest share of small size enterprises which make e-sales is in Sweden (35 %), Netherlands (33 %), the Czech Republic (32 %), and Denmark (32 %) in 2017. The lowest share of the small size enterprises is in Portugal (9%). As seen from the Figure 4.19, Turkey has a good participation rate among the large size enterprises, but it is below the European average for e-commerce sales for all types of enterprises.

Considering the Figure 4.22, enterprises in Ireland, Denmark, Finland and Sweden highly engage in e-commerce because citizens of these countries have willingness to buy goods and services online. The higher e-commerce volume in those countries encourage the local enterprises to open e-commerce companies. However, enterprises in Estonia, Hungary, Latvia, Lithuania, Luxembourg and Spain are less likely to interest in e-commerce compared to the other EU Member States.

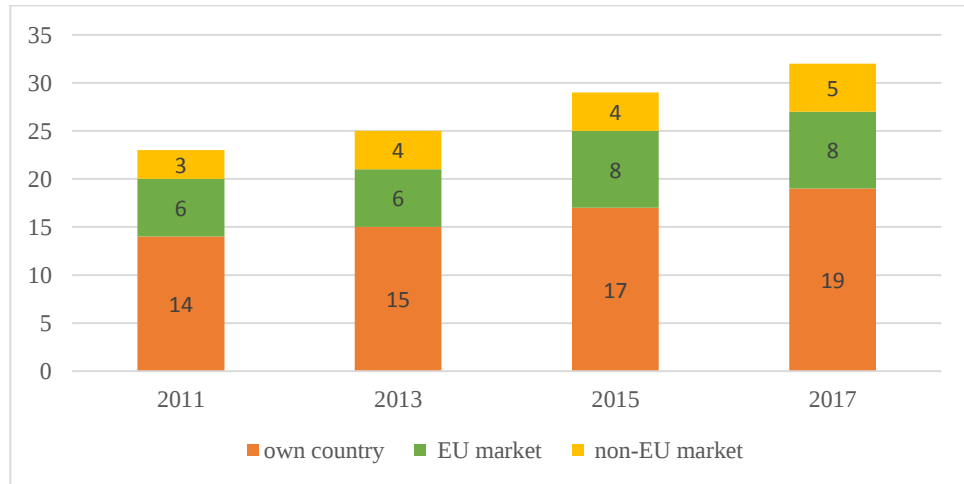


Figure 4.23: E-sales of SMEs in the EU-28, 2011-2017, (%)

Source: Eurostat. 2018f. **E-commerce Sales**. [isoc_ec_eseln2]

The following Figure shows the e-sales shares of SMEs in own country, other EU countries and non-EU countries between 2011 and 2017. According to Figure 4.23, there is an increasing trend at national and international market level since 2011. In 2017, 19% of SMEs made e-sales to the consumers in their own country, while 8% and 5% of SMEs made e-sales to the domestic consumers in the EU market and the non-EU market, respectively. Additionally, in 2011, 14% of SMEs made e-sales to the consumers in their own country, while 6% and 3% of SMEs made e-sales to the domestic consumers, in the EU market and the non-EU market, respectively. Over the period considered, e-sales of SMEs have increased by 36% in the own country, 33% in the other EU countries, and 66% in the non-EU market in comparison with 2011.

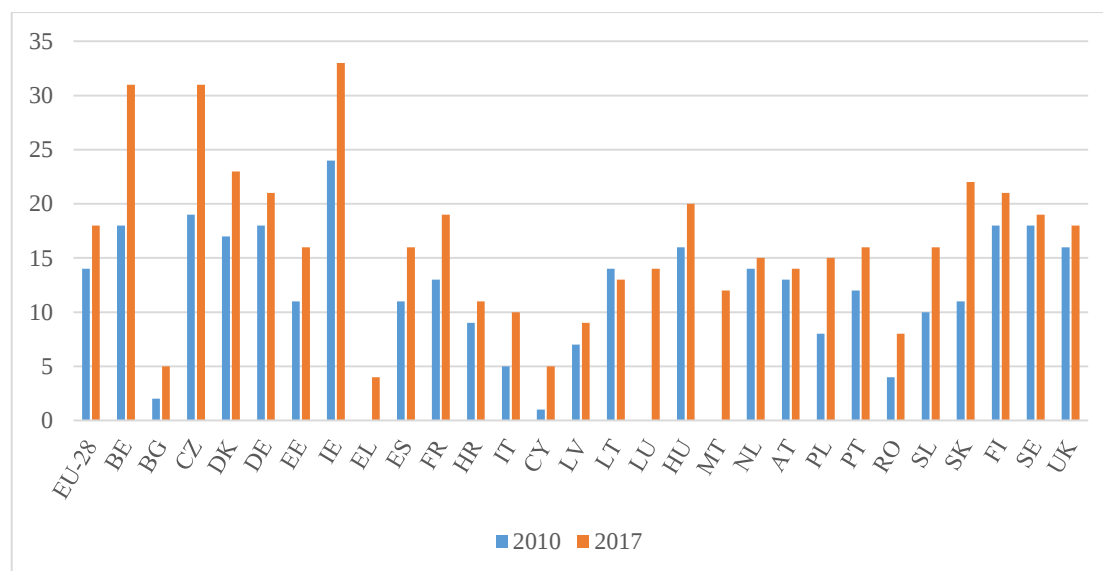


Figure 4.24: Total Turnover of Enterprises from E-commerce in the EU-28, 2010-2017, (% of turnover)

Source: Eurostat. 2018g. **Value of E-commerce Sales.** [isoc_ec_evaln2]

Total turnover of enterprises from e-commerce transactions in the EU between 2010 and 2017 is represented in Figure 4.24. According to the Figure, the average total turnover of e-commerce activities of the EU enterprises increased from 14% in 2010 to 18% in 2017. The enterprises' total turnover from e-commerce transactions is the highest in Ireland at 33% (up from 24% in 2010), Belgium and the Czech Republic at 31% (up from 18% and 19% in 2010, respectively) in 2017. During the same year, the lowest total turnover from e-commerce transactions is in Greece (4%), Bulgaria and Cyprus (5%), Romania (8%), and Latvia (9%). In 2010, the total turnover from e-commerce transactions of the European enterprises is the highest in Germany, Finland, and Sweden (18%), and in Denmark (17%).

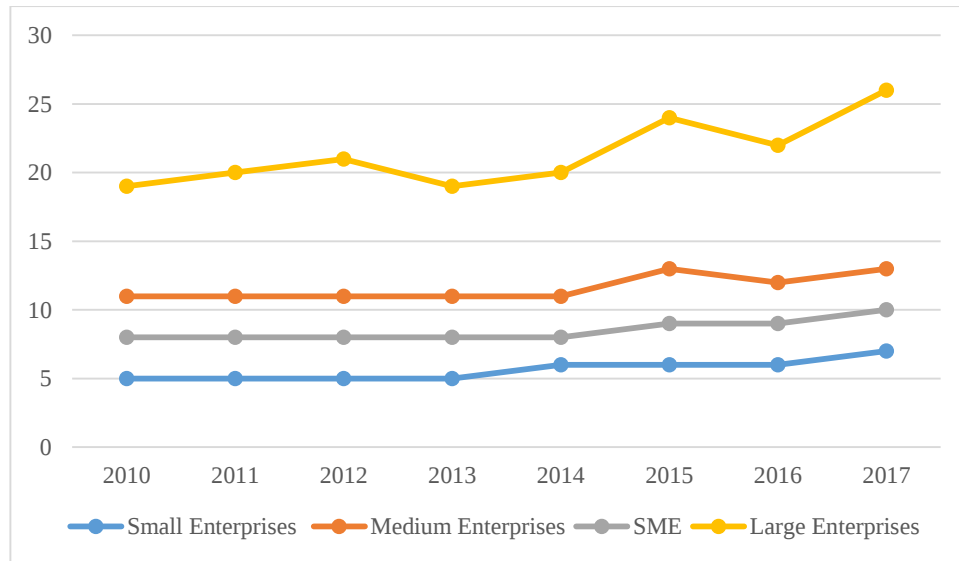


Figure 4.25: The Share of Enterprises' Turnover on E-commerce in the EU-28, 2010-2017, (% of turnover)

Source: Eurostat. 2018g. **Value of E-commerce Sales.** [isoc_ec_evaln2].

Turnover shares of e-sales in terms of small, medium and large size enterprises, including the average rate of SMEs between 2010 and 2017 is shown in Figure 4.25. In 2017, e-commerce sales have constituted 26% of the total revenue of large enterprises (up from 19% in 2010), 13% of the total revenue of medium size enterprises (up from 11% in 2010), and finally 7% of the total revenue of small enterprises (up from 5% in 2010). Turnover of the large size enterprises is higher than the SMEs since they can easily overcome the difficulties such as compliance costs or fragmented market structures, arising from the e-commerce. Thus, current market conditions still hinder SMEs to take advantage of the e-commerce activities.

4.3. The Existing Difficulties in E-commerce in the EU

Within the DSM various difficulties negatively affect the volume of e-commerce. Within the scope of the DSM strategy, some obstacles are mentioned, and some precautions are taken in the field of digital connectivity, security, and copyright, facilitated transportation etc. for well-performed e-commerce activities. According to the WIK-Consult (2019), the most common difficulties in e-commerce transactions have been identified in line with the responses obtained from several enterprises and individuals.

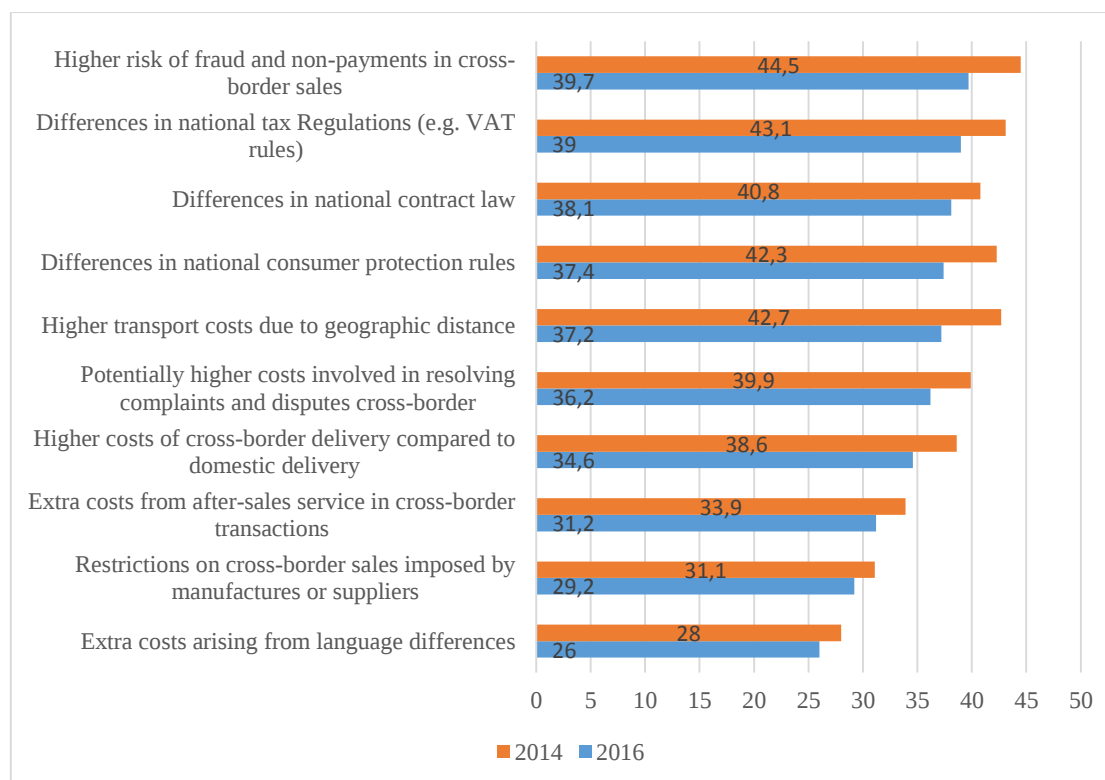


Figure 4.26: Barriers for Cross-border Online Sales intra EU, 2014-2016, (%)

Source: WIK-Consult. (2019). **Development of Cross-border E-commerce through Parcel Delivery.** Delivering for the Future 3: Workshop on Developments in the Postal Sector. Brussels, p.9.

Figure 4.26 presents the main barriers in the cross-border online sales in the EU between 2014 and 2016. These main barriers arise from the higher risk of fraud, non-payments in cross-border, differences in regulations such as tax regulations, contract laws, and consumer protection rules, higher transport and delivery costs compared to the domestic market, language differences, and restrictions between businesses partners (e.g. manufactures or suppliers). According to the Figure, perceived barriers in cross-border online sales of goods and services decreased between 2014 and 2016. Furthermore, differences in tax regulations and frauds arising from the existence of different tax rates are the main issues in cross-border online sales, in addition, concerns about them are still higher than the concerns about the other barriers.

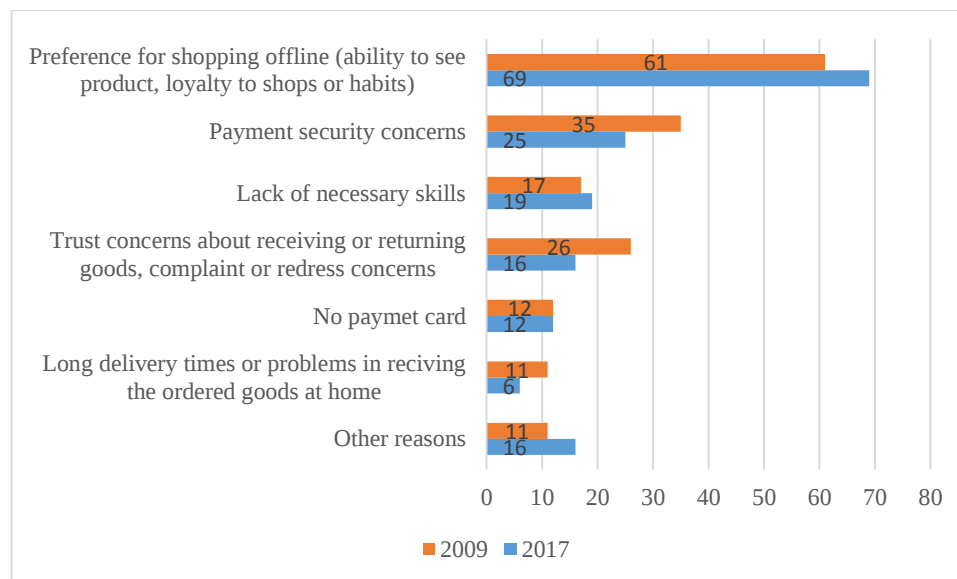


Figure 4.27: The Perceived Barriers to Buying/Ordering Online intra EU, 2009-2017, (%)

Source: WIK-Consult. (2019). **Development of Cross-border E-commerce through Parcel Delivery.** Delivering for the Future 3: Workshop on Developments in the Postal Sector. Brussels, p.27.

Figure 4.27 presents the barriers which affect the consumer decisions whether to shop online or not. These barriers arise from the consumers traditional shopping habits, lack of digital skills or payment cards, trust concerns about receiving or returning the ordered goods, problems about delivery systems, and other reasons. According to the Figure, perceived barriers in cross-border online purchasing of goods and services decreased between 2009 and 2017, while barriers related to shopping preferences and lack of necessary skills increased. Moreover, big majority of the EU consumers do not prefer to shop online due to their traditional shopping habits. Barriers in e-commerce transactions which discourage consumers to buy online are mostly related to payment security concerns rather than problems about delivery systems.

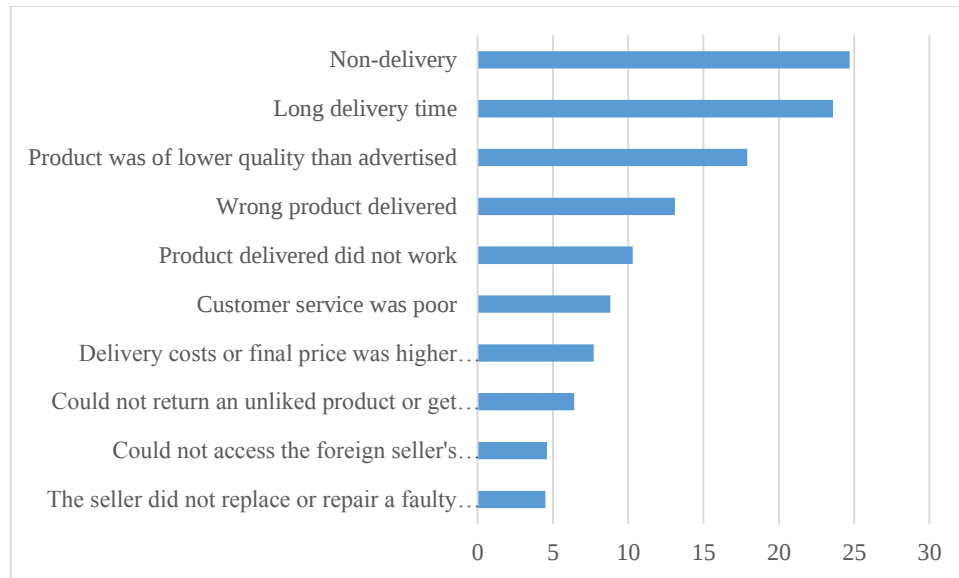


Figure 4.28: The Perceived Barriers to Buying/Ordering Online extra EU, 2015, (%)

Source: Hunter, Julie. 2017. **The Challenge of Protecting EU Consumers in Global Online Markets.** European Consumer Organisation (BEUC) and the Federation of German Consumer Organisations.
 *Sample size: 673 people

Figure 4.28 presents the barriers when consumers buy goods and services online from outside the EU. These barriers are considered as the major problems experienced by the European consumers. According to the Figure, problems arising from the cross-border online shopping from outside the EU is proportionally higher than the cross-border online shopping intra-EU. This situation shows that the trust concerns of European consumers for online shopping in the EU is higher in comparison with their online shopping experience from outside the EU (Hunter, 2017, 14).

4.3.1. The Taxation of E-commerce: VAT Applications in the Digital Single Market

VAT is a tax which is levied on consumption and is applied to all stages of production, not only at the end stage. VAT is valued as a percentage of the selling price of the goods and services, thus, it is added into the final price of the good. In addition, export is generally not a subject of VAT because it boosts international trade and promotes enterprises. In contrast, import is a subject of VAT. This means that all imported goods traded in a country are subject to the VAT (Pudenz, 2010).

Development of the digital economy has revealed some crucial issues regarding the calculation of the VAT. Especially, increased mobility of consumers and enterprises, transformation of business models and data-based structure, which are key characteristics of the digital economy, are challenging the traditional tax systems (Testa, 2017, 6).

In the early days of the internet, e-commerce did not have an important place in the economy, thus it was managed by general rules. Recently, adopting new and specific VAT rules for e-commerce transactions became crucial along with the developments in ICT and the growth in e-commerce. As discussed in the previous sections, e-commerce has been becoming popular among the European consumers and businesses, and the share of e-commerce in the EU market is growing day by day. However, the taxation of the e-commerce is also becoming more complex at the same time.

Correspondingly, the EU's DSM strategy aims to create better and effective e-commerce in the EU. The Strategy not only focused on the obstacles to the improvement of e-commerce but also presented its purposes to reduce existing burdens related to cross-border e-commerce which arise from different VAT regimes in the EU. Only if the current VAT rules are updated, the newly updated rules can support the DSM better, simplify the cross-border trade, and harmonize the digital economy.

The current VAT system in general is fragmented in the cross-border context because of the existence of 28 different VAT applications. This creates a huge confusion and an important administrative burden in trading cross-border online, especially for the SMEs. Moreover, the system is also convenient for fraud due to the existence of a major discrepancy between the anticipated and actual VAT revenues. Each Member State charges its own VAT rates under its own tax legislation. Furthermore, each Member State applies several rules for several situations, especially in cross-border sales, under the own current system. These situations are unconformable with the challenges of the new global digital economy. The EU tends to create a totally harmonized VAT system in the EU. Under a totally harmonized system, all transactions in the EU could be processed in the same way as if all transactions occur in one Member State.

In order to improve the current VAT rules with new approaches and modernize them for a well-functioning e-commerce, the European Commission adopted an Action Plan on

VAT on 7 April 2016 not only to support the creation of new jobs, growth, and to boost investments and competitiveness but also to move towards the Single European VAT area by removing the existing obstacles. Thus, the Action Plan on VAT puts in place the definitive rules for the Single European VAT area such as reducing the VAT fraud, determining the rate of taxes, and finally supporting the SMEs.

In addition, the European Commission published a new proposal for implementing the new detailed regulations on 11 December 2018. This proposal follows a deep reform of the VAT Action Plan towards a single EU VAT area presented in April 2016. Furthermore, it includes the measures that pave the way for a smooth transition to VAT for e-commerce that comes into force in January 2021. The main aim of the European Commission is to simplify VAT obligations for companies by providing regulations which cover rules for distance sales of goods as well as any type of services supplied to the consumers in the EU (European Commission, 2018g, 1).

4.3.1.1. VAT Applications and Origin or Destination Principles

According to the place of origin principle, the tax is imposed on the goods and services by taking into account the VAT rate of the place in which they are produced. Under the origin principle of the VAT, imports is not taxed, and exports bears tax (Schenk, Oldman, 2007, 22). This means that enterprises have to count the tax rates based on the local law and tax system, rather than the destination country' law. This situation creates big problems in terms of fair competition and VAT fraud. For instance, the place of origin principle encourages the enterprises to establish a company in a Member State in which VAT rate is the lowest, and also, to sell goods and services in another Member State in which VAT rate is the highest.

Therefore, the EU performed major changes in the sale of digital services and applied VAT rates on these services on 1 January 2015. The changes included the place of supply rules from one Member State to another Member State where the consumer is registered. In this context, the place of supply involves using different VAT rates of countries and their rules.

4.3.1.2. VAT Applications and Mini One Stop Shop

According to the European Commission, Mini One Stop Shop (MOSS) allows the taxable persons to supply e-services such as telecommunication services, television, and radio broadcasting services and electronically supplied services to non-taxable persons in the Member States where the taxable persons do not have an establishment or taxable persons are not identified (European Commission, 2013). The MOSS allows companies to avoid registration in each EU country, and thus reduces registration costs. The MOSS have two kinds of schemes which are the union scheme and the non-union scheme.

Under the union scheme, businesses have to be established in an EU country to register their businesses for MOSS. This country is called Member State of identification. Additionally, there is also a Member State of consumption where supply takes place. Businesses which are registered in MOSS cannot recognize their sales in the Member State of identification in terms of union tax scheme. In this case, sales of e-services must be accounted in terms of domestic tax rules. In other words, MOSS is not valid for these businesses when they supply e-services in the same country where they are identified. For instance, a Spanish company is established in Spain and sells mobile phone applications within the EU. When this company sells its e-services to the consumers in France, according to MOSS tax rules, this company liable to charge VAT rate of France instead of VAT rate of Spain. Briefly, taxation of these transactions occurs in Spain in terms of French tax rates. However, if this company sells its e-services to consumers in Spain, which is the country of establishment, then the company must charge national tax rules of Spain, not MOSS VAT rules.

Under the non-union scheme, businesses are established in the non-EU country can choose an EU country to register their businesses for MOSS. Selected country will be the Member State of identification. These businesses can supply e-services also in the same country of identification in the context of MOSS differ from union scheme. For example, a Turkish business supplies telecommunication services electronically, and it is established in Turkey. But, this company decided to take advantage of the EU e-commerce market. For this reason, it chose Belgium as a Member State of identification. In this case, this Turkish company must charge the VAT rate of countries where it supplied e-services in Belgium

under the MOSS VAT rules. It means that, if Turkish company supplied e-services to a consumer in Germany or even if in Belgium, the MOSS VAT rules are valid in all cases.



Figure 4.29: The VAT Collection Mechanism for E-services under Mini One-Stop-Shop

Source: Rakhan, Jayant. 2018. Changes in the EU VAT System Affecting Ecommerce. <https://www.slideshare.net/KaitlynMode/changes-in-the-eu-vat-system-affecting-ecommerce-91716434>. Accessed: 12.04.2019.

For a well-performing MOSS, every business has to quarterly declare VAT returns online to the tax authority of identification country. Then, the information about VAT returns is transferred from the tax authority of identification country to each tax authority of Member State of consumption. Figure 4.29 illustrates the MOSS system for the taxation of e-commerce for e-services. According to the MOSS example in the Figure, an e-commerce company in Luxembourg sells e-services online to the consumers in Italy, the UK and Germany. Next, VAT revenues of this transaction are transferred via the tax authority of Luxembourg to the other countries tax authorities. Thus, this e-commerce company in Luxembourg is exempt from registering to each country's tax authorities. Also, this situation decreases the company costs as a result of exemption from the VAT register. In the old system, an e-commerce company in Luxembourg had to register its company to each countries tax authority. Currently, this difficulty which is related to the VAT collection is removed by the MOSS system in e-commerce.

Furthermore, VAT registration costs for companies have decreased by 500 million Euro, or about 41,000 Euro per company, as a result of MOSS VAT application compared to

registering for VAT in every Member State where e-services supplied. Approximately 3 million Euro (about 70% of the total sales of e-services) of VAT was paid via the One Stop Shop (OSS) for e-services in 2015 (European Commission, 2017c).

4.3.1.3. VAT Applications and Distance Selling

Another method for the taxation of e-commerce is the ‘distance selling’ for selling goods cross-border online. It depends on the annual sales thresholds which are determined by every country freely. Prior to distance selling VAT regime, when businesses sold goods to consumers in another Member State, in every case, they had to meet some obligations to charge the local consumption taxes of each country in which they sold goods. It was creating difficulties on tax accounting and administration. For this reason, the EU created the Distance Selling VAT rules to abolish such administrative burdens. When the value of the sold goods is annually less than the determined VAT thresholds, businesses have to pay VAT in terms of their own local VAT rates. However, if the selling value is annually above these thresholds, businesses have to pay VAT rates of the country where consumers stayed. Briefly, each company is liable to recognize its sales in terms of its local VAT rates as long as the value of sales stays below the determined value of other countries in which company supply goods. In addition to this, businesses must be registered in that countries if the value of sales exceeds the thresholds of countries. The VAT thresholds of 2018 are provided on Table 4.4.

Table 4.4: VAT Rates and Distance Selling VAT Thresholds of Selling Goods Online

Member States	VAT Rates (%)	VAT Thresholds	
		National Currency	Euro Equivalent
Belgium	21	EUR 35,000	-
Bulgaria	20	BGN 70,000	EUR 35,791
Croatia	25	HRK 270,000	EUR 36,291
Czech Republic	21	CZK 1,140,000	EUR 44,873
Denmark	25	DKK 280,000	EUR 37,595
Germany	19	EUR 100,000	-
Estonia	20	EUR 35,000	-
Ireland	23	EUR 35,000	-
Greece	24	EUR 35,000	-
Spain	21	EUR 35,000	-
France	20	EUR 35,000	-
Italy	22	EUR 35,000	-
Cyprus	19	EUR 35,000	-
Latvia	21	EUR 35,000	-
Lithuania	21	EUR 35,000	-
Luxemburg	17	EUR 100,000	-
Hungary	27	EUR 35,000	-
Malta	18	EUR 35,000	-
Netherlands	21	EUR 100,000	-
Austria	20	EUR 35,000	-
Poland	23	PLN 160,000	EUR 37,859
Portugal	23	EUR 35,000	-
Romania	19	RON 118,000	EUR 25,305
Slovenia	22	EUR 35,000	-
Slovakia	20	EUR 35,000	-
Finland	24	EUR 35,000	-
Sweden	25	SEK 320,000	EUR 31,390
United Kingdom	20	GBP 70,000	EUR 80,197

Source: European Commission. (2018c). VAT Thresholds (April 2018).

For example, a Belgian company sells traditional lace to consumers in Luxemburg and the selling value is more than 100,000 Euro annually. In this case, this Belgian company must be registered as a non- resident VAT trader in Luxemburg. So, Belgian company will continue to sell products with the VAT rate of Luxemburg at 17%, rather than Belgian VAT rate of 21%. Moreover, this Belgian company will pay VAT to tax authority of Luxemburg.

All distance selling VAT rules are also valid for the businesses from non-EU countries. For example, a Turkish company which chose Finland as a Member State of identification, under the One Stop Shop VAT rules sells leather to consumers in Italy with the tax rate of Finland at 24%. Once this Turkish company exceeds the VAT threshold of 35,000 Euro,

this company must be registered as a non- resident VAT trader in Italy. After this time, Turkish company will continue to sell leather with the VAT rate of Italy 22%, rather than VAT rate of Finland. Additionally, this Turkish company will pay VAT to the tax authority of Italy.

4.3.1.4. VAT Applications and New Legal Provisions

European Commission launched a range of fundamental principles to make e-commerce more effective for the EU's VAT area on 4 October 2017 (Single VAT Area, [18.06.2018]). This proposal includes three main fundamental principles for definitive VAT regime. First principle is about the taxation place of supplied goods in cross-border sales intra-EU. Under this principle, transaction is charged with the VAT rate of Member State where goods are delivered. Second principle is that the supplier has to collect data when transaction is occurred from one Member State to other one, and also, supplier is liable for charging VAT as a general rule. Finally, last fundamental principal focuses on OSS. Businesses could make declarations, payments and deductions for cross-border online supplies of goods via OSS, as is already the case for the supply of e-services (Single VAT Area, [18.06.2018]). Figure 4.30 presents the VAT collection mechanism of online supplied goods in the EU market.

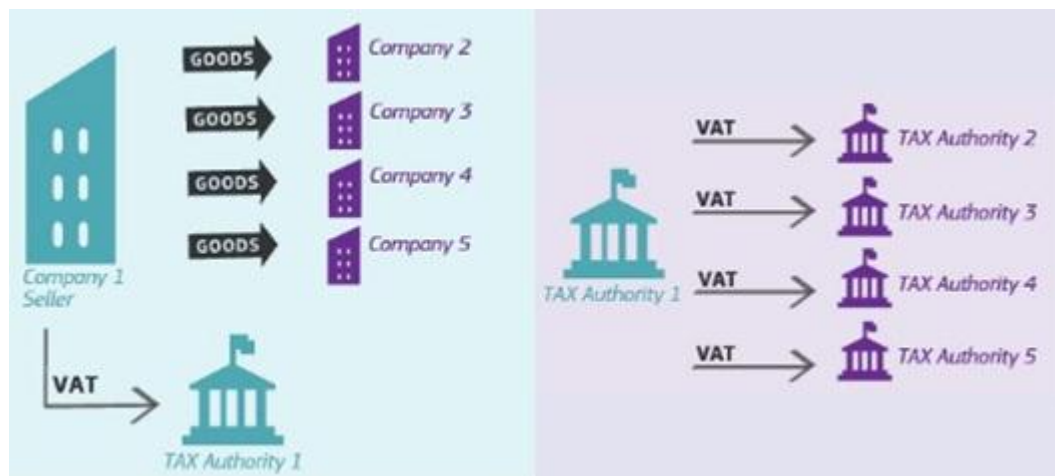


Figure 4.30: The VAT Collection Mechanism for Goods under One-Stop-Shop

Source: Single VAT Area. [18.06.2018].

Besides these attempts, the EU adopted new provisions on the distance sales and existing MOSS for VAT registrations on 5 December 2017. These provisions affect both the EU

and non-EU companies in the cross-border sale of goods and services to the EU customers. E-commerce for both consumers and businesses is becoming easier to buy or sell goods and services cross-border online as a result of new regulations, especially for start-ups and SMEs. These new steps accelerate the e-commerce in the EU.

The new principal measures are examined from two aspects, goods sold to the EU consumers from outside the EU and goods sold cross-border within the EU. There is a VAT exemption for imported goods from the third countries to the EU. This exemption works that if the imported goods have a value less than 22 Euro, then the supplier of these goods will not be liable to pay VAT to the EU country where goods delivered. In this case, this supplier has to pay VAT to the own country's tax authority. However, VAT practices on imported goods with a value less than 22 Euro from outside the EU into the EU will be repealed in 2021. Another important practice on VAT is that if the electronic sales of goods imported into the EU have a value of 150 Euro or below, the supplier will be liable to charge the VAT rate of the EU country where the consumer is located. On the other hand, if the value of electronic sales of goods imported into the EU exceeds the 150 Euro threshold, a full customs declaration will be required for the supplier in the mentioned country where supply takes place (VAT and e-commerce, [18.06.2018]).

Additionally, the EU adopted a new legal provision also for start-ups, micro-businesses, and SMEs to facilitate the e-commerce within the EU. If the value of cross-border sales is under 10,000 Euro, VAT on these transactions are adjusted according to the VAT regulations of the SMEs' country. SMEs benefit from simpler procedures for online cross-border sales of up to 100,000 Euro annually (European Commission, 2017d, 1).

4.3.2. The Existing Difficulties in Taxation of E-commerce in the EU

E-commerce takes an important place in the DSM and increases the efficiency by allowing people to access and exercise effectively online activities across the EU. Increased amount of people who buy goods and services online is the main driver for the development of the DSM. Furthermore, trend in e-commerce in the EU is continuously increasing.

However, e-commerce provides many opportunities as well as creates several difficulties. There are two main challenges which hinder the DSM taking the potential advantages provided by the market for cross-border e-commerce. These challenges contain geo-

blocking and tax frauds which are arising from the absence of harmonized regulations overall the EU and preventing the retailers and consumers to sell and buy online. Geo-blocking is one of the biggest and most obvious obstacles in the EU. It refers to the discriminatory practices which create difficulties for consumers accessing the online goods and services from e-commerce site located in another Member State (Carillo, [05.04.2019]). The taxation of e-commerce and VAT applications are also other crucial aspects of the DSM initiative and they directly affect the EU's GDP.



Figure 4.31: Results of VAT Reductions in E-commerce Transactions

Source: Vroom, Martijin. 2017. **Modernization of E-commerce Imports into the EU: A Customs and VAT Perspective.** Europese Fiscale Studies. p.13.

These difficulties in the field of VAT occur in three cases. The first challenge arises from the complexity of VAT obligations which is one of the crucial reasons behind the low penetration rate of enterprises to the e-commerce. According to Vroom (2017) estimation, enterprises bear cost for 8.000 Euro annually as a result of the compliance cost of VAT obligations. Second important challenge arise from the disparities between the EU and non-EU enterprises. The current system creates a significant disadvantage for EU companies in cross-border e-commerce transactions against the non-EU competitors. Another important taxation challenge of e-commerce results from the existence of VAT exemption for importation of small consignment. This challenge creates an issue about VAT collection and decreases the tax revenues (Vroom, 2017, 9).

In this framework, the EU aims to focus on necessary changes in taxation practices and new legal applications on VAT. The European Commission has adopted the destination principle in cross-border sales to prevent VAT fraud and confusions. The European Commission introduced the MOSS (on cross border sales of the digital services online) and the OSS (on cross border sales of the goods online) systems to eliminate the

confusions arising from the taxation of e-commerce. Therefore, the rule of registration for VAT in each Member State where the consumers are located was eliminated for the e-commerce companies which make e-sales to the other EU countries. In this context, e-commerce companies register their businesses in their own country's tax office. Next, tax revenues are transferred from the tax office of companies to the tax offices of countries where consumers are located. These attempts of the EU have facilitated the feasibility of e-commerce and reduced the costs of registering businesses.

Finally, “updating the VAT legislation in relation to e-commerce imports into the EU is crucial, as the current legislation is too complicated in terms of VAT compliance obligations and makes it too expensive, especially for SMEs, to operate in the cross-border B2C trade of goods” (Vroom, 2017, 30). Furthermore, all these new regulations on VAT applications are expected to boost the e-commerce positively.

5. CONCLUSION

Globalization requires digitalization, in meanwhile, digitalization has expanded the size of globalization. As a result of the fast pace of globalization, massive advances have occurred in technology, communication, and transportation. Such developments have led to the acceleration of the digitalization. Thus, digital transformation has gathered momentum in the whole economy. Particularly, digitalization has been observed more in developed countries such as the USA, Japan, South Korea, China, and Nordic countries rather than others. Also, the EU has taken some measures on digitalization to benefit from market opportunities and not fall behind its world competitors. Moreover, it aims to get a leading position in the global economy.

The importance of the digital economy is increasing over the last decades. The EU has also recognized the importance of the establishment of its own DSM. In line with the recent developments, the EU is transforming itself into a digital-based economy. This requirement is one of the stimulating factors for the creation of the EU's DSM. In this context, the European Commission has revealed a DSM strategy providing a harmonized digital environment, where all Member States would be liable for the same conditions and able to trade freely with no restrictions related to their location. The main aim of this attempt is to create inclusive regulations for digital marketing, e-commerce, and telecommunication under a common regulatory framework for all Member States in the EU.

The European DSM is launched on 6 May 2015 by the European Commission and it is predicted that the annual additional contribution of the DSM to the European GDP will be 415 billion Euro. In addition, the share of the ICT sector in the EU's GDP in 2015 is about 4%, and it is amounted 570 billion Euro. The ICT goods exports and imports of the EU in the digital sector is almost half in comparison with its world competitors, while the share

of ICT goods exports in total global trade is 5% and 11% in the EU and the world, respectively. The same situation occurs also for the ICT goods imports of the EU.

The EU has a great potential for the digitalization of its economy. ICT access and usage rate by individuals and enterprises have been increasing in the EU day by day. Recently, for instance, 73% of individuals and 70% of enterprises have ICT access. Among them, only 57% of individuals who have an access to internet and ICT do shopping online, while, only 18% of enterprises which have an access to internet and ICT make e-commerce in 2017. According to the OECD data, except from the 24% of European enterprises which do not have internet and ICT access in their companies, the participation rate of enterprises to e-commerce is observed low.

The digital infrastructure investments are among the core elements for the digital development of a country. The share of the European budget for the digital transformation and infrastructure is low. 12 billion Euro which corresponds to only 1% of the European budget is devoted to the digital transformation of the European economy and society for the 2021-2027 period. This situation causes the EU to keep behind its global competitors. The EU should have more investments in the development of digital infrastructure and focus on incentives increasing the potential of the digital market.

The DSM strategy particularly focuses on three important objectives which aim to ensure better market conditions for e-commerce, to create a legal and technical framework, and lastly to enhance the growth potential of the EU market by supporting the SMEs. In addition, it puts great emphasis on the geo-blocking and VAT restrictions that result from the fragmented structure of the EU market.

Obstacles which generally arise from traditional habits, legal and structural differences of countries have been reducing the share of e-commerce in the economy and hindering the development of e-commerce. Despite these obstacles and the inadequacy in the number of e-commerce companies in the EU, the contribution of e-commerce to the European economy is relatively higher than the contribution of the ICT sector. In 2015, the contribution of e-commerce transactions to the European economy is estimated at 2.5 trillion Euro (total turnover from e-commerce is at 18% in the EU-28), while the contribution of e-commerce transactions of world leading countries were 25 trillion US

Dollars. Despite the fact that the number of individuals who use and make purchases online is so high, inadequacy in the share of the EU's digital transformation investments creates a significant disadvantage against the European DSM.

One of the main interests of the EU, through the implementation of the DSM, is to provide better conditions for the SMEs. The European Commission set some objectives also for SMEs, especially for new start-ups. Furthermore, it emphasized the difficulties about the establishment of an e-commerce company and its cross-border sales. In this context, there are several initiatives to abolish the barriers faced by the SMEs. According to the Eurostat and OECD data, a considerable increase in the cross-border e-sales of SMEs is not observed in recent years, in comparison to the period before the DSM strategy is launched. A significant part of the e-sales of SMEs takes place in their own country, while only a small portion of e-sales occur in another Member States and non-EU countries. Another important situation is about the turnover of SMEs on e-commerce, however the turnover of e-commerce of the SMEs is observed low. In spite of all these results, the presence of SMEs in e-commerce has crucial impacts on the European digital economy, despite of their slow growth.

In consequence, the DSM has many benefits for the European economy. If investments in ICT sector and the R&D processes of companies are increased, the DSM would reach its real potential and the EU would benefit from its advantages. For this reason, the government and private investments in ICT sector and R&D expenditures should be increased. The DSM is expected to offer many opportunities for the EU countries. It holds great potential for SMEs as well as large companies by increasing the market efficiency. Moreover, DSM creates new job opportunities and renews the old ones. Also, it indirectly influences the employment rate of the EU countries.

REFERENCES

- About the Customs Union. [13.04.2018]. European Commission. http://ec.europa.eu/taxation_customs/40customs/customs_general_info/about/index_en.htm
- Achilleopoulos Nick, Johan E. Bengtsson, Patric Crehon, Angele Giuliano, John Sladatos. 2015. **The Collaborative Economy – Impact and Potential of Collaborative Internet and Additive Manufacturing**. European Parliament Research Service. December 2015. Brussels.
- ADB, UNESCAP. 2018. **Embracing the E-Commerce Revolution in Asia and the Pacific: June 2018**. Philippines: Asian Development Bank.
- Aghion, Philippe, Ufuk Akcigit. 2015. Innovation and Growth: The Schumpeterian Perspective. **Draft Survey for Discussion. COEURE Coordination Action**. June 11, 2015. Brussels.
- Angelovska, Nina. [06.03.2019]. 6 Reasons Why European's Don't Shop Online. <https://www.forbes.com/sites/ninaangelovska/2018/10/23/6-reasons-why-europeans-dont-shop-online/#68d3075f2869>
- Antonelli, Cristiano. 2008. **The Economics of Innovation: Critical Concepts in Economics**. Oxford: Routledge.
- Archer, Clive. 2008. **The European Union**. Oxford: Routledge Global Institutions.
- Arrow, J. Kenneth. 1961. The Economic Implications of Learning by Doing. **Technical Report No. 101**. Institute for Mathematical Studies in the Social Sciences, Applied Mathematics and Statistics Laboratories. Stanford. California.
- Bordo, D. Michael, Alan M. Taylor, Jeffrey G. Williamson. 2003. **Globalization in Historical Perspective**. USA: The University of Chicago Press.
- Broadband Commission. 2017. **Working Group on Education: Digital Skills for Life and Work**. Geneva: Broadband Commission for Sustainable Development.
- Brynjolfsson, Erik, Brian Kahin. 2000. **Understanding the Digital Economy: Data, Tools, and Research**. Cambridge: The MIT Press.
- Bukht, Rumana, Richard Heeks. 2017. **Defining, Conceptualising and Measuring the Digital Economy**. Development Informatics Working Paper Series Paper No. 68. Manchester: Centre for Development Informatics Global Development Institute, SEED.
- Bulgaria- DSM. [20.03.2019]. European Commission. <https://ec.europa.eu/digital-single-market/en/scoreboard/bulgaria>

- Carillo, A. Benito. [05.04.2019]. The European Digital Single Market: Achievements and Challenges for Europe. <https://www.viafirma.com/blog-xnoccio/en/the-european-single-digital-market/>
- Convergence Criteria for Joining. [18.04.2018]. European Commission. https://ec.europa.eu/info/business-economy-euro/euro-area/enlargement-euro-area/convergence-criteria-joining_en
- Copyright. [22.02.2019]. European Commission. <https://ec.europa.eu/digital-single-market/en/copyright>
- Degryse, Christophe. 2016. Digitalisation of the Economy and Its Impact on Labour Markets. Working Paper 2016.02. Brussels: European Trade Union Institute.
- Deloitte. [05.08.2018]. What is Digital Economy? Unicorns, Transformation and the Internet of Things. <https://www2.deloitte.com/mt/en/pages/technology/articles/mt-what-is-digital-economy.html>
- Denmark- DSM. [31.01.2019]. European Commission. <https://ec.europa.eu/digital-single-market/en/scoreboard/denmark>
- Ecommerce Europe. 2018. **The European Ecommerce Report 2018: Relevant Findings Outlined.** Brussels.
- E-commerce in Romania. [06.03.2019]. Ecommerce News. <https://ecommercenews.eu/e-commerce-in-europe/e-commerce-romania/>
- E-commerce in the United Kingdom. [06.03.2019]. Ecommerce News Europe. <https://ecommercenews.eu/e-commerce-in-europe/e-commerce-the-united-kingdom/>
- E-commerce in Western and Eastern Europe. [06.03.2019]. <https://www.funkybizz.com/online-sales-recent-trends-in-europe/>
- Eecke, Wilfried. 2013. **Ethical Reflections on the Financial Crisis 2007/2008 – Making Use of Smith, Musgrave and Rajan.** Berlin: Springer.
- EESC. 2016. **Action Plan on VAT: Towards a Single EU VAT Area – Time to Decide.** Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee. COM (2016) 148 Final. Brussels.
- Europe 2020 Strategy. [23.01.2019]. European Commission. <https://ec.europa.eu/digital-single-market/en/europe-2020-strategy>
- European Commission. 1997. A European Initiative in Electronic Commerce. COM (97)157. [https://www.anacom.pt/streaming/ecomcom.pdf?contentId=158287&field=ATTA](https://www.anacom.pt/streaming/ecomcom.pdf?contentId=158287&field=ATTACHED_FILE) CHED_FILE [09.08.2018].
- _____. 2013. **Guide to the VAT Mini One Stop Shop.** DG Taxation and Customs Union Indirect Taxation and Tax Administration. October 23, 2013. Brussels.

- _____. 2014. **Commission Expert Group on Taxation of the Digital Economy.** European Commission Report. May 28, 2014. Brussels.
- _____. 2015a. **Monitoring the Digital Economy & Society: 2016-2021.** DG Communications Networks, Content and Technology. December 2015. Brussels.
- _____. 2015b. **A Digital Single Market Strategy for Europe.** SWD (2015) 100 Final. Brussels.
- _____. 2015c. **A Digital Single Market Strategy for Europe.** Commission Staff Working Document COM (2015) 192 Final. Brussels.
- _____. 2016. **VAT Action Plan: Commission Presents Measure to Modernize VAT in the EU. Press Release. April 7, 2016.** Brussels.
- _____. 2017a. **Commission Publishes Mid-term Review of the 2015 Digital Single Market Strategy: Questions and Answers.** Fact Sheet. May 10, 2017. Brussels.
- _____. 2017b. **Europe's Digital Progress Report 2017.** Commission Staff Working Document SWD (2017) 160 Final. Brussels
- _____. 2017c. **Modernising VAT for E-Commerce: Questions and Answers.** Fact Sheet. December 5, 2017. Brussels.
- _____. 2017d. **VAT: Commission Welcomes Agreement on Simpler and More Efficient Rules for Businesses That Sell Goods Online.** Press Release. December 5, 2017. Brussels.
- _____. 2018a. **Questions & Answers on the Geo-blocking Regulation in the Context of E-commerce.** 23 March 2018.
- _____. 2018b. **EU Budget for the Future.** May 2, 2018. Brussels.
- _____. 2018c. **VAT Thresholds (April 2018).** Brussels.
- _____. 2018d. **International Digital Economy and Society Index 2018.** SMART 2017/0052. FINAL REPORT. A study prepared for the European Commission DG Communications Networks, Content & Technology. Luxembourg: Publications Office of the European Union.
- _____. 2018e. **Digital Economy and Society Index 2018.** May 18, 2018. Brussels.
- _____. 2018f. **Digital Scoreboard.** https://digital-agenda-data.eu/charts/desi-composite#chart={%22indicator%22:%22DESI_SLIDERS%22,%22breakdown%22:{%22DESI_1_CONN%22:5,%22DESI_2_HC%22:5,%22DESI_3_UI%22:3,%22DESI_4_IDT%22:4,%22DESI_5_DPS%22:3},%22unit-measure%22:%22pc_DESI_SLIDERS%22,%22time-period%22:%222018%22}
- _____. 2018g. **VAT: New Details on Rules for E-commerce Presented, Including a New Role for Online Marketplaces in the Fight against Tax Fraud.** Brussels.

- _____. 2018h. I-DESI 2018: How Digital is Europe Compared to Other Major World Economies. European Commission. <https://ec.europa.eu/digital-single-market/en/news/how-digital-europe-compared-other-major-world-economies>. Accessed: [15.03.2019].
- European Parliament. 2017. **Mapping the Cost of Non-Europe: 2014-19**. Fourth Edition. December 2017. Brussels: EPRS.
- European Policy Center. 2010. **The Economic Impact of a European Digital Single Market**. Brussels.
- Eurostat. 2018a. Households- Level of Internet Access. https://ec.europa.eu/eurostat/web/products-datasets/-/isoc_ci_in_h [15.05.2018].
- _____. 2018b. Individuals- Internet Use. https://ec.europa.eu/eurostat/web/products-datasets/-/isoc_ci_ifp_iu [16.05.2018].
- _____. 2018c. Individuals- Frequency of Internet Use. https://ec.europa.eu/eurostat/web/products-datasets/-/isoc_ci_ifp_fu [16.05.2018].
- _____. 2018d. Internet Access. [isoc_ci_in_en2]. https://ec.europa.eu/eurostat/web/products-datasets/-/isoc_ci_in_en2 [15.05.2018].
- _____. 2018e. Internet Purchases by Individuals. [isoc_ec_ibuy]. https://ec.europa.eu/eurostat/web/products-datasets/-/isoc_ec_ibuy [17.05.2018].
- _____. 2018f. E-commerce Sales. [isoc_ec_eseln2] https://ec.europa.eu/eurostat/web/products-datasets/-/isoc_ec_eseln2 [19.05.2018]
- _____. 2018g. Value of E-commerce Sales. [isoc_ec_evaln2]. https://ec.europa.eu/eurostat/web/products-datasets/-/isoc_ec_evaln2 [19.05.2018].
- _____. 2018h. Obstacles for Web Sales. [isoc_ec_wsobs_n2]. https://ec.europa.eu/eurostat/web/products-datasets/-/isoc_ec_wsobs_n2 [21.05.2018].
- _____. 2018j. Individuals' Level of Digital Skills. [isoc_sk_dskl_i]. https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_sk_dskl_i&lang=en [01.03.2019].
- _____. 2018k. **Employed ICT Specialists**. [isoc_sks_itspt]. https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=isoc_sks_itspt&lang=en [01.03.2019].
- Geissbauer, Reinhard, Jesper Vedso, Stefan Schrauf. 2016. **Industry 4.0: Building the Digital Enterprise**. 2016 Global Industry 4.0 Survey London: PWC.
- Guzzetti, Luca. 1995. **A Brief History of European Union Research Policy**. October. Brussels: Office for Official Publications of the European Communities.

- Heyman, Eric, Kevin Körner. 2018. **Digital Infrastructure: Bottlenecks Hamper Europe's Progress**. Deutsche Bank Research. EU Monitor. October 12. Germany.
- Hunter, Julie. 2017. **The Challenge of Protecting EU Consumers in Global Online Markets**. European Consumer Organisation (BEUC) and the Federation of German Consumer Organisations.
- ICT. (2010, 4 January). **ICT Definition**, <https://techterms.com/definition/ict>. Accessed: [11.09.2018].
- ICT sector- Value Added, Employment and R&D. [23.01.2019]. Eurostat. https://ec.europa.eu/eurostat/statistics-explained/index.php/ICT_sector_-_value_added,_employment_and_R%26D#Methodology_.2F_Metadata
- IMF. 2018. **Measuring the Digital Economy**. IMF Staff Report. February 28. Washington, D.C.
- International Post Corporation. 2017. State of E-commerce: Global Outlook 2016-21. <https://www.ipc.be/sector-data/e-commerce/articles/global-ecommerce-figures-2017>. Accessed: [11.04.2019].
- ITU. 2018. **Digital Skills Toolkit**. Geneva: International Telecommunication Union.
- Johansson, Pernilla, Joakim Lundblad. 2015. **A Digital Single Market-Growing the Baltic Sea Region: An Economic Impact Analysis**. Baltic Development Forum and Microsoft.
- Kraemer, L. Kenneth. Jason Dedrick, Nigel P. Melville, Kevin Zhu. 2006. **Global E-Commerce: Impacts of National Environment and Policy**. Cambridge: Cambridge University Press.
- Körner, Kevin, Marc Schattenberg, Eric Heymann. 2018. **Digital Economics: How AI and Robotics Are Changing Our Work and Our Lives**. Deutsche Bank Research. EU Monitor. May 14. Germany.
- Kumar, Vinod, Tasleem Arif, Majid Bashir Malik. 2014. Role of ICT in Driving E-commerce Business in Developing Countries. Paper presented at National Conference on Recent Innovations and Advancements in Information Technology - RIAIT 2014, Department of Information Technology, BGSB University, Rajour (J&K), November 26-27, 2014. https://www.researchgate.net/publication/287508707_Role_of_ICT_in_driving_e-commerce_business_in_developing_countries [10.09.2018].
- Lane, Neal. 1999. **Advancing the Digital Economy into the 21st Century. Information Systems Frontiers**. Vol. 1. Issue 3: 317-320. <https://link.springer.com/article/10.1023/A:1010010630396> [14.07.2018].
- Leadbeater, Charles. 1999. New Measures for the New Economy. **International Symposium on Measuring and Reporting Intellectual Capital: Experience,**

Issues, and Prospects, Technical Meeting. 9-10 June 1999. Report sponsored by the Centre for Business Performance of the Institute of Chartered Accountants in England and Wales. Amsterdam.

- Liu, Sixun. 2013. An Empirical Study on E-commerce's Effects on Economic Growth. **International Conference on Education and Management Science (ICETMS 2013)**. Atlantis Press.
- Lupu, Sebastian, Melisande Mual, Mees van Stiphout. 2016. E-Commerce Payment Methods Reports 2016. July. Merchant Risk Council.
- Malta-DSM. [24.01.2019]. European Commission. <https://ec.europa.eu/digital-single-market/en/scoreboard/malta>
- Macchi, Mauro, Bruno Berthon, Matthew Robinson. 2015. **Digital Density Index: Guiding Digital Transformation**. Accenture Strategy.
- Mesenbourg, L.Thomas. 2000. **Measuring the Digital Economy**. U.S. Bureau of the Census. Suitland, MD.
- Mutula, M. Stephen. 2010. **Digital Economies: SMEs and E-Readiness**. Hershey: IGI Global.
- Nortvedt, Thomas. 2019. **A Digital Single Market?** Cullen International 14 March 2019. European Commission. Brussels.
- OECD. 2012. The Digital Economy. OECD Hearings. DAF/COMP (2012)22. Paris: OECD Publishing. <http://www.oecd.org/daf/competition/The-Digital-Economy-2012.pdf> [05.08.2018].
- _____. 2012b. **ICT Skills and Employment: New Competences and Jobs for a Greener and Smarter Economy**. OECD Working Party on the Information Economy. OECD Digital Economy Papers, No.198. Paris: OECD Publishing.
- _____. 2013. **Electronic and Mobile Commerce**. OECD Digital Economy Papers No.228. Paris: OECD Publishing.
- _____. 2015. Data-Driven Innovation for Growth and Well-Being. Interim Synthesis Report. October. Paris: OECD Publishing. <http://www.oecd.org/sti/ieconomy/data-driven-innovation.htm> [28.11.2018].
- _____. 2017. **Measuring Digital Trade: Towards a Conceptual Framework**. Working Party on International Trade in Goods and Trade in Services Statistics. March 22-24, 2017. STD/CSSP/WPTGS (2017)3. Paris: OECD Publishing.
- _____. 2018. Enabling the SMEs to Scale Up. **SME Ministerial Conference, 22-23 February 2018**. Mexico.

- OECD Stat. 2018a. ICT Access and Usage by Households and Individuals: ICT Access and Usage by Individuals. <https://stats.oecd.org/> [08.07.2018].
- _____. 2018b. ICT Access and Usage by Businesses. <https://stats.oecd.org/> [08.07.2018].
- _____. 2018c. ICT Employment. <https://data.oecd.org/ict/ict-employment.htm> [08.07.2018].
- Paczynski, Wojciech. 2014. **The Cost of Non-Europe in the Single Market: Digital Single Market**. European Parliament Research Service. Brussels: EPRS.
- Population and Population Change Statistics. [05.04.2018]. https://ec.europa.eu/eurostat/statistics-explained/index.php/Population_and_population_change_statistics
- Pudenz, J. Raymond. 2010. The Value-Added Tax: Effects on Tax Revenue, U.S. Corporations, and Individual Taxpayers. Honors Program Theses. University of Northern Iowa. University Honors Program.
- Rakhan, Jayant. 2018. Changes in the EU VAT System Affecting Ecommerce. <https://www.slideshare.net/KaitlynMode/changes-in-the-eu-vat-system-affecting-ecommerce-91716434>.
- Sapir, Andre. 2011. **European Integration at the Crossroads: A Review Essay on the 50th Anniversary of Bela Balassa's Theory of Economic Integration**. *Journal of Economic Literature*. Vol.49. No.4: 1200-1229.
- Schenk, Alan, Oliver Oldman. 2007. **Value Added Tax A Comparative Approach**. New York: Cambridge University Press.
- Sharafat, R. Ahmad, William H. Lehr. 2017. **ICT-Centric Economic Growth, Innovation and Job Creation**. Chapter 1: ICT Engines for Sustainable Development. Switzerland.
- Single VAT Area. [18.06.2018]. European Commission. https://ec.europa.eu/taxation_customs/business/vat/action-plan-vat/single-vat-area_en
- Start a Business in Ireland. [09.03.2019]. Enterprise Ireland. <https://www.enterpriseireland.com/en/Start-a-Business-in-Ireland/Startups-from-Outside-Ireland/Key-Sectors-and-Companies-in-Ireland/ICT-sector-profile.html>
- Statista. 2019. Retail E-commerce Sales Worldwide from 2014 to 2021 (in billion US dollar). <https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/>. Accessed: [12.04.2019].
- Strohmaier, Rita. 2014. **The Evolution of Economic Structure under Pervasive Technological Change: A Methodological and Empirical Study**. Austria.

- Tapscott, Don. 1994. **The Digital Economy. Promise and Peril in the Age of Networked Intelligence**. New York: McGraw-Hill Education.
- _____. 2014. **The Digital Economy Anniversary Edition: Rethinking Promise and Peril in the Age of Networked Intelligence**. New York: McGraw-Hill Education.
- Testa, M. Giulio. 2017. VAT Treatment of E-commerce Intermediaries. Master Thesis. Lund University. School of Economics and Management Department of Business Law.
- British Computer Society. 2013. The Digital Economy. The Chartered Institute for IT. https://policy.bcs.org/sites/policy.bcs.org/files/digital%20economy%20Final%20version_0.pdf [05.08.2018].
- Tsakanikas, Aggelos, Svetoslav Danchev, Ioannis Giotopoulos, Efi Korra, Grigoris Pavlou . 2014. **ICT Adoption and Digital Growth in Greece**. Foundation for Economic and Industrial Research. Greece.
- Totonchi, Jail, Kholamreza Manshady. 2012. Relationship between Globalization and E-Commerce. **International Journal of e-Education, e-Business, e-Management and e-Learning**. Vol. 2. No. 1.
- UNCTAD. 2017. **Information Economy Report 2017: Digitalization, Trade and Development**. Switzerland: UN Publications.
- UNCTAD Stat. 2018. Share of ICT Goods as Percentage of Total Trade, Annual, 2000-2016. <https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx> [10.07.2018]
- United Nations. 2002. **Electronic Commerce, International Trade and Employment: Review of the Issues**. April 8. Economic Commission for Latin America and the Caribbean ECLAC. Washington.
- VAT and E-commerce. [18.06.2018]. KPMG. <https://home.kpmg.com/xx/en/home/insights/2017/12/vat-and-e-commerce.html>
- Vroom, Martijin. 2017. **Modernization of E-commerce Imports into the EU: A Customs and VAT Perspective**. Europese Fiscale Studies.
- Vu, M. Khuong. 2011. ICT as A Source of Economic Growth in the Information Age: Empirical Evidence from the 1996-2005 Period. *Telecommunication Policy*, 35(2011), 357-372.
- WIK-Consult. (2019). **Development of Cross-border E-commerce through Parcel Delivery**. Delivering for the Future 3: Workshop on Developments in the Postal Sector. Brussels, p.9.
- World Bank. 2016. **World Development Report 2016: Digital Dividends**. Washington, DC: World Bank.

CURRICULUM VITAE

Name and Surname: Sinem Saktaş

Place and Date of Birth: Ankara / 26.10.1992

E-mail Address: saktassinem@gmail.com

Education: Yıldız Technical University
Graduate School of Social Sciences
Master in Economics (English)
2016 – 2019 (3.20 / 4.00)

Universita degli Studi di Parma
Facolta di Economia
International Business Management
2017-2018 (21/30)

Kocaeli University
Faculty of Economics
Department of Economics
2010 – 2015 (3.28 / 4.00)

Karamürsel Alp Anatolian High School
Mathematics Sciences
2006 – 2010 (77 / 100)